THE COMMONHEALTH

SPECIAL NUMBER

1942

DEPARTMENT ACTIVITIES

1941

MASSACHUSETTS
DEPARTMENT OF PUBLIC HEALTH

Publication of this Document Approved by the Commission on Administration and Finance
2,500-3-43-11492

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

Commissioner of Public Health, Paul J. Jakmauh, M.D.

Public Health Council

Paul J. Jakmauh, M.D., *Chairman*

R. Nelson Hatt, M.D.
Gordon Hutchins
Francis H. Lally, M.D.
Richard M. Smith, M.D.
Richard P. Strong, M.D.
James L. Tighe, B.A.Sc., C.E.

Florence L. Wall, *Secretary*

Division of Administration	Under direction of Commissioner
Division of Tuberculosis	*Director* and *Deputy Commissioner*, Alton S. Pope, M.D.
Division of Adult Hygiene	*Director*, Herbert L. Lombard, M.D.
Division of Biologic Laboratories	*Director*, Elliott S. Robinson, M.D.
Division of Child Hygiene	*Director*, M. Luise Diez, M.D.
Division of Communicable Diseases	*Director*, Roy F. Feemster, M.D.
Division of Food and Drugs	*Director*, Hermann C. Lythgoe, S.B.
Division of Genitoinfectious Diseases	*Director*, Ernest B. Howard, M.D.
Division of Sanitary Engineering	*Director*, Arthur D. Weston, C.E.

Assistant to the Commissioner, John J. Poutas, M.D.

State District Health Officers

Northeastern District	Robert E. Archibald, M.D.
North Metropolitan District	Vlado A. Getting, M.D.
South Metropolitan District	Henry M. DeWolfe, M.D.
Southeastern District	Harold W. Stevens, M.D.
Worcester District	Oscar A. Dudley, M.D.
North Connecticut Valley District	Walter W. Lee, M.D.
South Connecticut Valley District	Charles E. Gill, M.D.
Berkshire District	Morris Taylor, M.D.

Institutions and Superintendents

Lakeville State Sanatorium	Leon A. Alley, M.D.
North Reading State Sanatorium	Carl C. MacCorison, M.D.
Rutland State Sanatorium	Ernest B. Emerson, M.D.
Westfield State Sanatorium	Roy Morgan, M.D.
Pondville Hospital	George L. Parker, M.D.

ACTIVITIES

OF THE

DEPARTMENT OF PUBLIC HEALTH OF MASSACHUSETTS DURING 1941

THE PUBLIC HEALTH COUNCIL

At the end of the fiscal year closing November 30, 1941, the Department of Public Health was constituted as follows:

Commissioner of Public Health, Paul J. Jakmauh, M.D.

Public Health Council

R. Nelson Hatt, M.D., 1945
Gordon Hutchins, 1944
Francis H. Lally, M.D., 1942
Richard M. Smith, M.D., 1943
Richard P. Strong, M.D., 1946
James L. Tighe, B.A.Sc., C.E., 1947

Thirteen meetings of the Department were held during the year. Twelve public hearings were held as provided by statute relative to approval of the taking of certain lands for the protection of water supplies, approval of plans for sanitary sewers and sewage treatment works, the proposed use of land for cemetery purposes, an alleged nuisance caused by the keeping of swine, and appeals from actions of local milk inspectors in refusing to grant licenses to sell milk.

The Committee on Sanitary Engineering, composed of Mr. Tighe, Chairman, Mr. Hutchins, and the Commissioner, has met whenever necessary prior to the regular meetings of the Department and submitted recommendations on matters of sanitary significance.

In October, in order to re-establish the reputation for research work which the Lawrence Experiment Station held for many years, a cooperative arrangement between the Department and Harvard University for the employment of a Consultant for Research Work was approved.

The Council has performed its regular duties as imposed by law, including the promulgation of regulations allowing short-time, high-temperature pasteurization of milk and the revision of rules and regulations relative to diseases dangerous to the public health, the operation of plants for the purification of shellfish, the business of slaughtering, the treatment of persons exposed to rabies, and the use of blood or other tissues for purposes of transfusion. A renewal contract for the care of tuberculous patients from Hampden County at the Westfield or Rutland State Sanatorium was approved for a period of three years, and the contract with the Massachusetts General Hospital for the care of persons suffering from arthritis was renewed for one year. The approval of appointments of medical personnel in the Department and at State and county sanatoria, of subsidies to various cancer clinics, of dispensaries and laboratories before licensing, of out-of-State shellfish dealers who have been approved by their respective state shellfish authorities and the United States Public Health Service, and of contracts for the production of certified milk, constitutes other matters upon which the Council has acted.

At a meeting of the Department on January 13, 1942, the Commissioner of Public Health presented to the Council a summary of the activities of the Department for the year 1941, and after consideration it was voted that the outline, together with the foregoing brief summary of the activities of the Public Health Council, be approved and adopted.

THE COMMISSIONER OF PUBLIC HEALTH

To the Public Health Council:

Gentlemen: This summary shows briefly the public health activities of the Commonwealth as carried on under near-normal conditions of peace time. As at the end of the year it seems certain that we are entering upon a new era, the expansion of

our activities as planned for the ensuing year must be subject to changes which will adapt them to the circumstances of a more militaristic period, and curtailment or deferment of certain of them will no doubt be necessary.

I. Administration

During the year I personally attended or was represented at regular meetings of the following boards:

Approving Authority, consisting of the Secretary of the Board of Registration in Medicine, the Commissioner of Education, and the Commissioner of Public Health, to consider standards for medical schools and graduates thereof, some of the meetings including inspection of the various medical schools in the Commonwealth; Rating Board, consisting of the Surgeon General of the Commonwealth, the Commissioner of Public Health, and the Commissioner of Public Safety, to consider the retirement of members of the State Police; State Planning Board, consisting of the Commissioners of Conservation, Public Health, and Public Works, and six appointive members; Reclamation Board, consisting of representatives of the State Departments of Public Health and Agriculture; Massachusetts School Lunch Advisory Committee; the Massachusetts Child Council, and similar groups.

In April I attended the Annual Conference of State and Provincial Health Authorities and the State and Territorial Health Authorities held in Washington, at which time I was appointed to the following committees of the State and Provincial Health Authorities of North America for 1942: Committee on Child Hygiene; Subcommittee on Mental Hygiene; Committee on Environmental Sanitation; Subcommittee on Records and Subcommittee on Uniform Railway Code; and Committee on Records and Reports. I also attended the Annual Meeting of the American Public Health Association, the Annual Meeting of the American Medical Association, a meeting of the Society for Public Health Administration, and a meeting called by the Surgeon General of the United States Public Health Service to consider the hazards of mercury poisoning in the fur industry.

National Defense. The United States Public Health Service has assigned a representative to the First Corps Area to act as liaison officer between the health departments and the armed forces in the correlation of health and defense activities. We have cooperated with this liaison officer to the fullest extent in the control of certain communicable diseases, examinations for tuberculosis and genitoinfectious diseases, food inspection, sanitation and other conditions relative to health which present new problems with sudden overcrowding of living conditions in industrial and defense areas. He has cooperated with the Department by visiting communities adjacent to cantonment areas and under the Facilities Act has made surveys with a view to determining local needs and rendering assistance in order to continue a high standard of health. He has worked closely with the Department and has submitted for our advice applications for additional hospital and nursing facilities throughout the State.

Sanitary surveys have been made by the Department in the vicinity of Camp Edwards, Fort Devens and Westover Field.

The Department has been active in the defense program, and the organization formerly designated for disaster relief has been revised so that in the event of any emergency, coordination of personnel, service and facilities is immediately available. In this regard we have been in frequent consultation with the State Public Safety Committee as well as representatives of the Civilian Defense Program. Chapter 719, signed by the Governor on October 30, 1941, creates a State Emergency Commission to provide for the safety of the Commonwealth in time of military emergency. His Excellency has appointed me as a member of this Commission. The Department is represented on the staff of the Adjutant General by the Director of the Division of Sanitary Engineering.

A great number of the major defense problems relate to public health, and the responsibility for the solution of these problems and the direction of normal activities to meet emergency situations naturally becomes the duty of the Department of Public Health. The Department is endeavoring to cooperate with all defense agencies including the Massachusetts Committee on Public Safety, the Committee on Civilian Defense, and more than 300 local community organizations. In view

of a possible emergency in the State House or immediately adjacent thereto, when first aid would be promptly needed, I have arranged for sufficient space and facilities to be made available as first aid quarters, with sufficient professional personnel and material facilities of the Department available as need requires.

New Legislation—New Activities. The 1941 session of the General Court enacted legislation affecting the work of the Department of Public Health in several instances.

Under Chapter 601, amended by Chapter 697, a clerk or registrar cannot accept notice of intention of marriage until he has received from both parties to the intended marriage a certificate signed by a physician practicing in Massachusetts or by a physician on active service in the armed forces of the United States. If a physician making an examination under this law discovers evidence of an infectious disease he must inform both parties of the nature of the disease and of the possibilities of transmitting it in marriage or pregnancy. Such examination must include a blood test for syphilis performed by the Department laboratory or a laboratory approved by the Department. With but one month's experience upon which to base an opinion, from the great number of inquiries which have arisen there would appear to be some uncertainty in regard to the practicability of enforcing this law as written.

Chapter 661 of the Acts of 1941 authorizes the Department to license hospitals and sanatoria. An advisory committee will be appointed to aid the Department in formulating rules and regulations relative to this new activity.

Under authority of Chapter 506, the Department may admit to the Lakeville State Sanatorium, for physiotherapy and muscle training, a limited number of persons with spastic paralysis. Studies under this legislation will be conducted in connection with the crippled children's program.

Chapter 612 authorizes the Department, with the approval of the Commission on Administration and Finance, to prepare and distribute without and within the Commonwealth, antitoxins, serums, vaccines, etc., applicable to the prevention or cure of disease, for the use of the armed forces of the United States or in civilian defense work.

Chapters 306 and 334 provide for the furnishing of medical service at low cost to subscribers to charitable corporations formed under these acts. Under Chapter 334 certain agreements made by medical service corporations with medical organizations and physicians are subject to the approval of the Department of Public Health, but to date no applications relative to such approval have come to our attention.

Chapter 37 of the Resolves of 1941 directs the Department to make a study relative to the eradication and control of ragweed.

Chapter 388 gives the Department further authority to prevent the pollution and contamination of inland and tidal waters. Chapter 353 increases the mandatory powers of the Department relative to preventing pollution of the Charles River.

Certain legislation was passed relative to investigation and improvement of the Metropolitan water supply and sewerage needs. I have agreed to serve as the representative of this Department on the special commission authorized by Chapter 91 to investigate the use of the Quabbin Reservoir by additional municipalities and the financing of the furnishing of water to communities within and adjacent to the Metropolitan Water District. The Department is represented by the Director of the Division of Sanitary Engineering on the special commission to consider sewage disposal needs of the North and South Metropolitan Sewerage Districts, under Chapter 720 of the Acts of 1941, and on a special commission to investigate housing, under Chapter 71 of the Resolves of 1941. Another resolve, Chapter 93, provides for a special investigation relative to additional sewerage works for the South Metropolitan Sewerage System in Dorchester and Milton.

Approval of Laboratories. The work of evaluating the performance of laboratories with a view to approval, begun two years ago under authority of Chapter 344 of the Acts of 1939, has been continued. Thirty-four laboratories have received approval and over 60 other laboratories have been approved for certain tests, especially for testing blood from prospective blood donors and performing routine serologic

tests for syphilis, and will receive certificates of approval after further evaluation of other tests. The Wassermann Laboratory continues to send specimens to laboratories already approved in order to insure the continuance of a satisfactory rating.

Milk. 1941 has shown a record increase in the number of communities which have passed regulations requiring the pasteurization or certification of milk. Eighteen communities were added, bringing the total to 80, which represents about 78 per cent of the population of the State. It is estimated that over 90 per cent of the milk sold in the Commonwealth is pasteurized or certified.

Camps. The Department continues to have jurisdiction over the sources of water supply and sewage disposal works at all recreational, overnight and trailer camps licensed by local boards of health. In 1941 the original act relative to this matter was amended, making it compulsory for this Department to notify the owner of the camp by registered mail, in addition to the local board of health, relative to its findings in matters of water supply and sewage disposal. During the past year over 600 overnight and recreational camps were examined by the Department staff.

Arthritis. There is an increasing demand on the part of the public for hospitalization and treatment facilities for the alleviation of suffering from this disease, and the inauguration of a general arthritis program similar to programs carried on for other chronic diseases seems desirable. Consideration has been given to the establishment of a central research bureau adjacent to or in connection with an outstanding hospital. With existing institutions transforming their available facilities with a view to the needs of industry and national defense, the question of a special hospital for cases of arthritis and other chronic diseases should be given further consideration for the twofold purpose of immediate alleviation of suffering based on present knowledge, and further research in order to ascertain the most satisfactory treatment.

The results of the study at the Massachusetts General Hospital to date indicate that cases of arthritis should be treated as are tuberculosis cases, that pain should be treated immediately in order to prevent loss of normal joint function, and that it is desirable to have a small unit in connection with a general hospital or a teaching hospital for the careful study and intensive treatment of arthritic patients in order to ascertain a more satisfactory treatment than present limited knowledge of the disease permits.

New England Health Institute. On April 2, 3 and 4 the Eleventh New England Health Institute was held in Boston. This Institute was planned and conducted by the Massachusetts Department of Public Health with the aid of the following collaborating agencies: the health departments of the other New England States, the United States Public Health Service, the Children's Bureau of the United States Department of Labor, the Massachusetts Central Health Council, the Massachusetts Public Health Association, and the New England Sewage Works, Water Works, and Tuberculosis associations. The Institute was a marked success, with 1865 registrants representing twenty-seven of the forty-eight states, Canada, the Philippines and China; 121 individuals of prominence in national, state and local health organizations contributed their time as speakers or chairmen of various sections.

Local Health Administration. The coordination and extension of state public health activities into a more unified district organization, based on experience in the Worcester District, was expanded to the North Connecticut Valley District early in 1941. The functions and activities of these two areas appear to be acceptable to the local boards of health and it is anticipated that early in 1942 the Westfield District may be so organized since in its physical set-up it already contains in a large measure sufficient facilities to make possible expansion with minimal expense. It is also proposed that early in 1942 the Pittsfield area be organized, with minor changes and additions to existing facilities to meet the needs of the district. The third contemplated district is that of southeastern Massachusetts. Here there is great need for additional office space and equipment in order to conform to the service given in the Worcester and North Connecticut Valley areas and meet the demands of the southeastern section of the State.

Public Health Nursing. The position of Chief Supervisor of Public Health Nursing

was filled on September 15, 1941. As the year closes we are planning more effective coordination of the nursing activities of all Divisions by placing the nursing personnel administratively in the Division of Administration under the Chief Supervisor of Public Health Nursing as soon as suitable office space is prepared.

Social Service. The establishment in the Division of Administration of the position of Supervisor of Social Service is in keeping with the present day trend in public health administration. With the development of district health offices, a more generalized program in medical social service seems possible which would tend to more efficient service. The Supervisor of Social Service would be responsible to the directors of the various divisions of the Department in the formation and extension of their programs in the various districts. This change, however, must be accomplished gradually because of the long established routine of the social workers in the various Divisions.

Services for Crippled Children. On September 1, 1941 the Department completed five years of service to crippled children. During the five-year period 2,089 crippled children were admitted to service, of whom approximately 900 are still under active care, indicating the need of long-continued orthopedic treatment in a large proportion of cases. Regular monthly clinics are held at the ten clinics located in the following communities: Brockton, Fall River, Gardner, Haverhill, Hyannis, Lowell, Northampton, Pittsfield, Salem and Worcester. During the five-year period the average attendance was 16 children at each clinic session. In the past year the total clinic attendance has exceeded 2,000, including new patients sent by their physicians, and patients returning for further observation, adjustment of apparatus, and similar reasons. During 1941 approximately 230 children were admitted to hospitals for surgical treatment. Almost 4,000 physical therapy treatments were given and approximately 5,700 home visits were made to patients during the year.

The reporting of congenital deformities and other crippling conditions in infants resulted in 188 such reports, which is approximately the same as 1940, the first year in which reporting was required by law.

It is hoped that programs for the care of children suffering from acute rheumatic fever and from cerebral palsy can be inaugurated early next year.

II. Communicable Disease

There has been an increase in German measles and mumps, with a slight increase in the incidence of measles, scarlet fever, and whooping cough. Although our 1941 total reported cases of communicable disease may be the highest since 1936, diphtheria, typhoid fever and paratyphoid fever reached new low levels. The following data are submitted in reference to the principal communicable diseases:

Anterior Poliomyelitis. For three years we have enjoyed a very low incidence of this disease. This year there has been a slight increase which did not reach epidemic proportions.

Diphtheria. I can report a record low for this disease and were it not for an increase in one city which had an unusually large number of cases, the incidence in the State would have been under 100. Diphtheria immunization in its newer aspects has created considerable interest, particularly in relation to national defense.

Encephalitis, Infectious. No new cases or new types have been reported.

Meningitis, All Forms. There has been a decided increase in meningococcic meningitis. From the locations of the reports it would appear that the increase occurred in certain areas affected by concentration of the population. Previous to May 15, 1941, only meningococcic meningitis and Pfeiffer's bacillus meningitis were reportable, but on that date all forms were made reportable. Reports have been received of a number of cases of pneumococcal meningitis and a small number of cases due to staphylococcus, streptococcus, and Salmonella organisms.

Pneumonia. The incidence this year represents the lowest number of cases ever recorded in the State. Even with the usual expected increase because of the seasonal nature of the disease, a record low was reached in the State. The use of serum is apparently decreasing due to the introduction of chemotherapy. The apparent

change in the clinical behavior and the appearance of pneumonia cases indicates that we must continue our studies on the use of therapeutic serum to guide us in the future development of our pneumonia program. With serum available for nine types of pneumonia the distribution and use of the material must be encouraged.

Scarlet Fever. The increase noted during the year marks a continuation of the gradual increase in this disease which, however, has not reached epidemic proportions in any area since 1932. Although the control program carried on in the State at present is limited, this increase is evidence that we must enlarge upon a prophylactic preventive program.

Smallpox. We are approaching the close a of ten year period in which no cases of this disease have occurred in Massachusetts.

Typhoid and Paratyphoid Fever. The number of sporadic cases of these two diseases has continued to decline. Twenty-one typhoid carriers were added to the typhoid carrier list; at the present time this list numbers 164, as compared to 159 last year.

Undulant Fever. Although this disease reached an unusually high level, indicating the need of complete pasteurization of milk and closer inspection of the process of pasteurization, intensified case-finding efforts, particularly in the central and western parts of the State, may account for a part of the high incidence.

Whooping Cough. Although this disease showed an increased incidence for the year as a whole, the increase occurred during the early part of the year, and the end of the year showed a tendency toward a lower level.

Other Diseases. No cases of psittacosis, Rocky Mountain spotted fever, or tularemia were reported during the year.

Division of Tuberculosis

The year 1941 showed an upward trend in tuberculosis morbidity and mortality. There were nearly 300 more cases reported than in the previous year. Since the ratio of adult male to female deaths from tuberculosis has been rising steadily, the question of whether this increase may not be due, in part at least, to increased employment and overtime by industrial workers should be given consideration.

During the school year 1940–41 new school tuberculosis clinics were held in 31 communities, in which 14,487 children were given the tuberculin test, 5,237 of whom were X-rayed. The incidence of tuberculosis found in this group was 3.2 per 1,000 X-rayed. Re-examination clinics were held in 31 communities, in which 1,252 children were X-rayed. The incidence of tuberculosis found in this group was 1.0 per 1,000 X-rayed.

In addition to the school clinics, our clinic staff X-rayed approximately 34,000 National Guardsmen and soldiers inducted into the Army during the year. With the exception of the purchase of the films, the entire work of X-raying, processing and interpreting was done by our clinic personnel, using regular portable X-ray machines.

Division of Genitoinfectious Diseases

The Department's program in regard to the control of gonorrhea and syphilis has indicated the lowest reported incidence of these two diseases. Toward the end of the year this program was largely directed toward the relation of syphilis and gonorrhea to national defense. While there was a decrease in the amount of arsenicals distributed during the year, the increased interest in the use of mapharsen indicates that this product will eventually displace the other arsenical drugs. Part of the decrease in the distribution of bismuth subsalicylate is also probably due to the increased use of mapharsen. During the past year the Department began the distribution of sulfathiazole to clinics for the treatment of gonorrhea.

The follow-up of 123 pregnant women reported to have syphilis, approximately half of whom have been delivered, indicates no congenital syphilis among their infants.

In a program for the control of prostitution and allied problems, the Department has cooperated with the Social Protection Division of the Massachusetts Committee on Public Safety, the United States Public Health Service, the Division of Social

Protection of the Federal Security Agency, the Boston Licensing Board, the Massachusetts Society for Social Hygiene, various police chiefs, and the Army and Navy. We have found no indication of the need of drastic measures to control prostitution nor to date has it been considered necessary to invoke the authority granted under Federal legislation on this matter.

All selectees have been examined for syphilis serologically by draft board physicians and the results of the analyses of these tests over the country indicate that Massachusetts had the second lowest positive syphilis rate in the country. All selectees, soldiers and sailors reported in Massachusetts with positive syphilis have been interviewed by the Department or clinic nurses.

Laboratories

Antitoxin and Vaccine Laboratory. The routine production and distribution of biologic products has been maintained at the usual rate although in the later months of the year special attention was directed toward products needed for national defense. The preparation of serum albumin for use as a substitute for blood in transfusion is being studied.

Wassermann Laboratory. The total number of all tests performed has showed an increase of 20 per cent, and of tests for syphilis of over 25 per cent, such increases being largely attributable to the serologic tests for syphilis done for the National Guard and the selective service boards. The duties imposed on the Department by Chapter 601 of the Acts of 1941, which requires a blood test on all persons applying for marriage licenses in Massachusetts, will result in the submission of a great many more specimens to this laboratory by physicians and institutions.

Bacteriological Laboratory. During the year this laboratory made over 75,000 examinations on specimens submitted, principally for diphtheria, gonorrhea, malaria, pneumonia, tuberculosis, typhoid fever and undulant fever. While this was less than the number examined in 1940, the decrease is probably due to the smaller number of specimens submitted for examination for diphtheria and for the enteric diseases.

III. Hygiene

Division of Child Hygiene

Upon request, prenatal clinics were visited and assisted by the child welfare physicians, dentists, nursing supervisors and nutritionists of this Division; obstetrical packages for use in home deliveries were demonstrated by the nursing supervisors; instruction in maternal and child care was given at mothers, classes; the study of the deaths of premature infants was continued and plans made for expanding the study; 23 nursery supervisors took the refresher course offered for the care of premature infants; well child conferences were held at which over 3,000 children were examined. A school hygiene survey was made and recommendations based on the findings sent to the local school authorities.

In cooperation with the State Department of Public Welfare an institute for public health nurses was held, assistance was given to local communities, and new local nursing services and public health activities were stimulated.

Many requests have been received for our nutritionists to serve on various committees and participate in educational nutritional programs. Lectures on dental health were given to teachers and school officials, and students at medical, dental and nursing schools. Much interest has been shown in the Department's work along the lines of parent education.

"The Massachusetts Vision Test" as approved by members of the State Departments of Education and Public Health is available to schools upon request. The Department has cooperated with school superintendents in regard to the development of methods and techniques for testing hearing.

The special project planned last year involving a study of pregnant diabetic women is being continued.

The health education activities of the Department were expanded by exhibits and lectures to health councils and community health organizations. Under the sponsorship of the State Departments of Education and Public Health, the Massa-

chusetts School Superintendents' Association and the Massachusetts School Principals' Association, the Joint Committee on Health Education is engaged in a special study of the health needs of high school pupils.

Division of Adult Hygiene

The year 1941 marked the completion of the fifteenth year of the cancer program of the Department. During this period the average delay between first recognized symptom of the disease and the first visit to a physician has decreased from 6.5 months to 4.6 months. In the early years of the program it was found that only 15 per cent of the cancer patients visited their physician within a month after noting their symptoms, whereas now we find that this number has risen to 21 per cent. Another result of our program has been the increased interest and change in attitude toward cancer on the part of both the laity and the medical profession, as evidenced by increased attendance at cancer clinics, the extension of educational programs, and the organization of cancer control committees in additional communities. The Division has carried on extensive research activities and epidemiological surveys. The number of specimens submitted for pathological examination reached over 4,000, which is a record high. Much interest has been shown in our program by representatives of other states and countries, indicating that Massachusetts is acting as a leader in constructive procedures in the control of cancer.

IV. Environmental Control

Division of Sanitary Engineering

The number of applications received by the Department for advice on sanitation and related matters was slightly higher than in 1940. The compliance with many of these requests necessitated field examinations by representatives of the Water and Sewage Laboratories and the Lawrence Experiment Station as well as the engineering staff of this Division.

Rainfall. The rainfall recorded over the State for the year was about 18 per cent less than normal, with a deficiency in every month except June and July. This rainfall deficiency has resulted in serious shortages in drinking water supplies, water supplies for industrial purposes, and extremely low stages of streams. At the same time the records of water consumption in the Metropolitan Water District have showed a progressive increase, particularly in the communities where important defense industries are located. Because of the drought the following streams have shown the effect of the pollutional load discharged into them and the Department has advised communities and industries concerning the matter: the Aberjona, Assabet, Blackstone, Charles, Hoosick, Housatonic, Merrimack, Millers, Quinebaug, Seven Mile, Squannacock, and Ten Mile rivers.

Sewage Disposal. New sewage treatment works were put into operation during the year in East Longmeadow, Ludlow, Chicopee (Westover Field), Fort Devens and Camp Edwards. The Department has recommended particularly changes in the Nut Island sewage treatment plant as a part of the program for improving Boston Harbor, the construction of works at Hull for the removal of present objectionable conditions, the installation of suitable devices for improving sewerage conditions at Gloucester, and additional sewage treatment works to serve the town of Ayer, particularly a new United States Defense Housing Project in connection with Fort Devens. In addition, the Works Projects Administration has been advised relative to 145 sewerage projects. The following communities have been advised relative to certain sewerage needs: Danvers, Hingham, Swampscott, Quincy, Holden, Fitchburg, North Brookfield, Gloucester, Warren, Northbridge and Natick.

Shellfish. During the year the areas from which the taking of shellfish for food is prohibited in Barnstable Harbor, Boston Harbor and Gloucester Harbor were redefined, Scituate Harbor was closed, Manchester and Oak Bluffs harbors were closed temporarily during the summer season, and an additional area at Coles River, Swansea, was opened. Certain areas in Boston and Gloucester harbors and the Ispwich River were approved for the taking of shellfish for purification purposes.

Cross Connections. The inspection of cross connections between public water supplies and industrial or other secondary water supplies has been continued. During the past year 852 plants were inspected, at which 637 cross connections were found. However, at 484 of these plants the public water supply was found to be adequately protected by approved double check valves, and at 38 the water supply was partially protected. The owners of the other 115 plants were given instructions as to adequate protection of the water supply.

Water and Sewage Laboratories

In addition to the routine chemical, microscopical and mineral examinations made in these laboratories in connection with the oversight of water supplies, sewage disposal works and the pollution of streams, the following studies were conducted: Experiments to determine the saturation index and the required dosage of chemicals for corrosive correction treatment of certain municipal water supplies; experiments on the lime treatment of a scum found floating on the surface of the Imhoff tank at the Natick sewage disposal plant; analyses of samples of scum discharged from industrial plants at Woburn and of similar material found floating on the Aberjona River, Winchester; experiments on the possible effects of the use of chlorinated settled sewage at Weston College for irrigation on grasses and plants; examination of two samples of industrial wastes, one of which was suspected of containing benzene and the other of containing gelatin; testing of a gas-mask canister for its chlorine absorption capacity; testing of a vacuum breaker device sold for installation on flush closets to determine its corrosiveness both in fresh and salt waters; investigation of so-called "black water" appearing in the public water supply of Groton; the use of various solvents and techniques for the determination of fats in sewage; a comparison between the colorimetric and electrometric methods for hardness determination in water; and examinations on samples of water from Boston Harbor to determine the presence of organisms that might be used as an index of pollution.

Lawrence Experiment Station

The regular bacterial examinations of water and shellfish, chemical analyses of industrial wastes, and sand analyses were continued at this laboratory. Differentiation studies on coliform bacteria from Merrimack River water stored for thirty days and subsequently filtered through sand were continued; four high rate trickling filters have been operated· three identical septic tanks with varying detention periods have been operated in order to study over a period of time the destruction of sludge and the clarification of sewage; in connection with the shortage of alum, successful studies were made both in the laboratory and in the field in regard to the substitution of iron salts for alum in the treatment of trade wastes; further study was made of starch wastes which were found responsible for the high bacterial content of the Charles River; the examination of samples of grease balls from the North Shore indicated that mineral oil discharged into sewers was at least partially responsible for such formations.

Division of Food and Drugs

The year has shown an increase in the number of pasteurization plants throughout the State, particularly in the smaller communities. The inspectors of this Division have checked constantly on the methods and results of the pasteurization and have attained a great improvement in many of the plants. High temperature, short time pasteurization of milk is again allowed in Massachusetts, this action of the Department being taken under authority of Section 48A of Chapter 94 of the General Laws after consideration of studies conducted in New York and Connecticut. To date only three pieces of apparatus for pasteurization by this method have been installed in Massachusetts and frequent investigations will be made in order to improve the somewhat unsatisfactory conditions found on first inspection.

The members of the Food and Drug Division have worked closely with the Federal inspectors in allied lines. It is regretted that the changes which the Department suggested in the Massachusetts food and drug law in order to conform more closely with the Federal law were not passed by this year's Legislature. Massachusetts manufacturers doing interstate business must comply with the Federal law. Because

of this they meet unfair competition from other Massachusetts manufacturers who are not engaged in interstate business and who can therefore operate under a less strict and rigid law.

In addition to the routine inspectional and investigational work regarding bakeries, soft drink and ice cream plants, cold storage warehouses, slaughtering, etc., the production and sale of sausages and olive oil have required constant supervision by our inspectors and chemists. In the case of sausages, decomposed meat and an illegal amount of soy bean meal have been detected in many instances, in most of which convictions were obtained in court and penalties imposed. Due to the difficulty of obtaining pure olive oil from Europe, the adulteration and misbranding of this product are increasing.

V. Regulations

Rules and regulations have been promulgated by the Department of Public Health relative to:

Diseases dangerous to the public health
Approved Aug. 9, 1938
Revised Oct. 11, 1938
Revised Feb. 14, 1939
Revised May 13, 1941

Conveyance of bodies dead of any disease dangerous to the public health
Approved Aug. 9, 1938
Revised Feb. 14, 1939

Funerals of persons dead of any disease dangerous to the public health
Approved Aug. 9, 1938

Treatment of persons exposed to rabies
Approved Aug. 10, 1937
Amended May 13, 1941

Sale of rabbits intended for food purposes
Approved May 14, 1929

Dispensary license
Approved May 10, 1938

Approval of bacteriological and serological laboratories
Approved Sept. 12, 1939

Distribution of biologic products
Approved Apr. 9, 1935
Amended May 14, 1940

Use of blood or other tissues for purposes of transfusion
Approved Mar. 14, 1939
Amended Oct. 7, 1941
Amended Nov. 4, 1941

Payment for certain laboratory tests on specimens from cases of pneumonia
Approved Nov. 15, 1938

Use of a common drinking cup
Amended Mar. 22, 1916

Providing of a common towel

Amended Mar. 22, 1916

Use of the common drinking cup and common towel in factories, workshops, manufacturing, mechanical and mercantile establishments

Jails, houses of correction, prisons and reformatories

Approved July 6, 1905

Lodging houses

Approved July 6, 1905

Cremation

Adopted Dec. 5, 1907
Amended Oct. 29, 1918

Cancer clinics

Approved Jan. 15, 1935

Approved prophylatic remedy for use in the eyes of infants at birth

Approved May 12, 1936

Control of gonorrhea and syphilis

Approved Aug. 9, 1938
Revised Aug. 8, 1939
Revised Nov. 6, 1940

Provision of treatment for persons suffering from gonorrhea and syphilis who are unable to pay for private medical care

Approved Aug. 10, 1937

Tuberculosis hospitals

Approved May 10, 1938

Tuberculosis dispensaries

Approved May 10, 1938

Manufacture and bottling of carbonated nonalcoholic beverages, soda water, mineral and spring water

Approved Apr. 7, 1936

Approval of contracts for the production and distribution of certified milk

Approved Oct. 14, 1936

Establishments for the pasteurization of milk

Approved Feb. 12, 1935
Amended July 8, 1941

Short-time high temperature pasteurization of milk

Approved July 8, 1941
Amended Nov. 4, 1941

Purity and quality of food

Approved Feb. 9, 1937

Bakeries and bakery products

Approved Feb. 14, 1933

Frozen desserts and ice cream mix

Approved Sept. 11, 1934

Hams, pork butts and sausage containing pork products intended to be eaten without cooking

Approved Feb. 12, 1924

Business of cold storage

Approved Oct. 10, 1933

Sale of cold storage eggs

Approved July 11, 1922

Business of slaughtering and meat inspection

Approved Dec. 10, 1935
Amended Dec. 10, 1940

Tag to be attached to each article of bedding and each article of upholstered furniture

Approved Nov. 12, 1935

Sterilization of feathers, down and secondhand material intended for use in the manufacture of articles of bedding and upholstered furniture

Approved Nov. 12, 1935

Operation of plants for the purification of shellfish

Approved Apr. 7, 1936
Amended Oct. 10, 1938
Amended Oct. 7, 1941

Cross connections between public water supplies and fire and industrial water supplies

Approved Feb. 9, 1937

Protection of the drainage areas and sources of water supply in cities and towns and fire and water districts and water companies

Amended Apr. 8, 1941

IX. Financial Statement

Federal Grants from the United States Public Health Service and Children's Bureau

The allotments for public health work for the Federal fiscal year July 1, 1941 to June 30, 1942 are as follows:

Federal Security Agency, United States Public Health Service		
Division of Administration	$ 12,192.16	
Division of Adult Hygiene	37,355.00	
Antitoxin and Vaccine Laboratory	17,640.00	
Division of Communicable Diseases	27,560.00	
Division of Food and Drugs	14,105.00	
City of Boston Health Education Project — Subsidy	4,460.00	
Division of Occupational Hygiene	21,195.00	
Pneumonia Control Project	10,000.00	
Division of Sanitary Engineering	66,391.00	
Division of Tuberculosis	27,836.33	
Training Personnel	2,600.00	
Vitamin Assay Work	7,340.00	
Division of Administration (Local Health Units)	12,430.00	
Barnstable County	2,280.00	
Berkshire District	4,505.00	
Nashoba Associated Boards of Health	11,784.00	
North Connecticut Valley District	9,780.00	
South Connecticut Valley District	3,100.00	
Southeastern District	2,070.00	
Worcester Health District	12,502.50	
Total — Public Health Service		$307,125.99
Federal Security Agency, Venereal Disease Control		
Training Personnel	$ 4,335.00	
Division of Genitoinfectious Diseases	120,890.70	
Wassermann Laboratory	35,340.00	
Instruction in Control of Gonorrhea and Syphilis — Subsidy to Harvard School of Public Health	9,220.00	
City of Boston Venereal Disease Control — Subsidy	21,800.00	
Postgraduate Courses in Venereal Disease	8,050.00	
Total — Venereal Disease Control		199,635.70
Department of Labor, Children's Bureau		
Crippled Children's Services A Account	$ 82,506.15	
Crippled Children's Services B Account	48,266.91	
Total — Crippled Children's Services		130,773.06
Maternal and Child Health Services A Account	$ 128,430.47	
Maternal and Child Health Services B Account	12,255.00	
Total — Maternal and Child Health Services		140,685.47
Grand Total — Federal Funds		$778,220.22*

* Includes balances of previous year.

Department of Public Health

Appropriations and Expenditures for Year Ended November 30, 1941

	Appropriation and Amounts Brought Forward	Expenditures to Nov. 30, 1941
Division of Administration	$ 38,062.26	$ 37,366.67
Division of Adult Hygiene	90,800.00	82,630.22
Division of Child Hygiene	83,113.01	80,430.49
Division of Communicable Diseases	92,460.90	88,226.32
Division of Genitoinfectious Diseases	313,303.05	249,934.16
Division of Food and Drugs	76,017.43	71,527.51
Division of Biologic Laboratories:		
Antitoxin and Vaccine	116,274.28	110,644.66
Wassermann Laboratory	26,382.50	24,413.41
Administration of Shellfish Law	2,918.51	2,279.22
Division of Water Supply and Sewage Disposal	156,586.46	146,877.02
Division of Tuberculosis	46,460.64	45,827.89
Subsidies to Cities and Towns	494,745.54	494,739.77
Tuberculosis Clinic Units	50,057.42	47,237.24
Chronic Rheumatism	36,827.75	35,960.94
Sanitary Condition of Certain Rivers	352.52	288.40
	$1,624,362.27	$1,518,383.92

Receipts for Year Ended November 30, 1941

Licenses, etc.	$8,975.71

Financial Statement Verified (Second)
Walter S. Morgan, *Comptroller.*

State Sanatoria and Pondville Hospital

	Appropriations and Balances	Expenditures	Receipts
Lakeville State Sanatorium	$336,455.32	$332,816.59	$121,021.39
North Reading State Sanatorium	275,930.27	268,272.91	69,363.78
Rutland State Sanatorium	365,653.34	359,236.56	74,570.73
Westfield State Sanatorium	440,366.89	437,261.79	121,317.51
Pondville Hospital	361,695.85	354,673.74	67,608.40

Special Appropriations

	Appropriations and Balances	Expenditures
LAKEVILLE		
Chapter 419, 1941, Item 2022–21		
Fire Protection and Sprinklers	$5,840.00	——
Chapter 730, 1941, Item 2022–22		
Water Supply	1,725.00	——
Chapter 419, 1941, Item 2022–23		
Physiotherapy Unit at Children's West Ward	9,000.00	$ 5,290.23
NORTH READING		
Chapter 419, 1941, Item 2023–22		
Fire Protection and Sprinklers	2,200.00	——
Chapter 419, 1941, Item 2023–23		
Fire Protection Equipment	1,375.00	——
Chapter 419, 1941, Item 2023–24		
Improvements to Water Supply	4,100.00	——
RUTLAND		
Chapter 419, 1941, Item 2024–21		
Sewerage and Sewage Disposal	3,200.00	——
Chapter 419, 1941, Item 2024–22		
Fire Protection	2,700 00	——
WESTFIELD		
Chapter 419, 1941, Item 2025–21		
Fire Protection Equipment	2,000.00	——
P.W.A. Docket 1155 — Mass. State Project H-102		
Cancer and Tuberculosis Group	404.13	404.13
PONDVILLE		
Chapter 419, 1941, Item 2031–21		
Water Supply — Replacing Pipe Fixtures	700.00	——
Chapter 419, 1941, Item 2031–22		
Roads — Rebuilding and Resurfacing	3,000.00	2,475.80
Chapter 419, 1941, Item 2031–23		
Sprinkler System	1,200.00	——
Chapter 419, 1941, Item 2031–24		
Fire Fighting Equipment	2,650.00	——
Chapter 683, 1941, Item 2031–25		
Power Plant Improvements	100,000.00	——

Respectfully submitted,

PAUL J. JAKMAUH,
Commissioner of Public Health.

Approved and signed
R. NELSON HATT
GORDON HUTCHINS
FRANCIS H. LALLY
RICHARD M. SMITH
RICHARD P. STRONG
JAMES L. TIGHE
Public Health Council

THE DIVISION OF ADULT HYGIENE

HERBERT L. LOMBARD, M.D., *Director*

A cancer control program must have three objectives: first, prevention of cancer; second, early recognition and treatment of the disease; and third, studies to learn more about the disease. To attain these objectives, diagnostic cancer clinics, treatment centers, research, and education are necessities. Education should incite the individual to action. Diagnostic facilities must be available to him, and treatment centers if he is found to have the disease. Research may cover studies both of the causative factors of the disease and evaluations of the methods used in a cancer control program. Every activity should be subjected to appraisal to determine the

worthwhileness of its continuation. The Massachusetts Cancer Program attempts to integrate cancer control by following these general procedures.

A continuation of the shorter period of delay between first recognizable symptoms and visit to physician first noted in 1936; a far greater use of the Tumor Diagnosis Service; more clinic admissions than ever before; thirty-nine teaching clinics attended by 898 physicians; a continuation in the decline of the adjusted cancer death rate among females; and an extension of the Cooperative Cancer Control Committees — were the principal measures of achievement of the Division of Adult Hygiene for 1941.

TABLE I. — *Outstanding Accomplishments*

	Average 1927–35	Average 1936–40	1941
Number of State-aided cancer clinics	12	21	23
Number of specimens diagnosed by Tumor Diagnosis Service	2,813	3,349	4,669
Number of doctors using Tumor Diagnosis Service	421	700	889
Number of hospitals using Tumor Diagnosis Service	97	115	118
Number of cancer patients attending cancer clinics	759	1,616	1,712
Percentage of cancer patients receiving treatment within one month of first symptoms	3.1	3.8*	6.9**
Percentage of cancer patients receiving treatment within four months of first symptoms	20.3	27.2*	32.9**
Median delay, in months, of cancer patients between first symptoms and visit to physician	6.5	5.2	4.0
Percentage of cancer patients going to physician within one month of first symptoms	15.0	19.1	23.5
Percentage of cancer patients attending cancer clinics referred by physicians	61.1	85.0	84.3
Female age adjusted cancer death rate per 100,000 population	125.2	120.6	118.3

* four-year average.
** 1940.

TABLE II. — *Massachusetts State-Aided Cancer Clinics, 1941*

CLINIC	Attendance New Patients*	Attendance Old Patients	Total Attendance	Attendance New Cancer Patients	Percentage Cancer Among New Patients	Number of Teaching Clinics	Attendance of Physicians at Teaching Clinics	Social Service Contacts	Percentage of Recommended Procedures Carried Out	Percentage Diagnostic X-rays	Percentage Biopsies
Beth Israel	161	1,454	1,615	80	49.7	0	0	132	93	75	34
Beverly	69	281	350	18	26.1	0	0	788	83	43	12
Boston Dispensary	429	2,038	2,467	132	30.7	1	103	1,666	98	30	34
Brockton	137	125	262	64	46.7	3	68	1,031	81	9	31
Fall River	142	544	686	54	38.0	4	143	485	77	6	4
Fitchburg	44	196	240	15	34.1	4	26	746	84	23	23
Gardner	50	76	126	17	34.0	5	71	422	74	40	0
Gloucester	33	63	96	12	36.3	3	41	285	71	42	0
Greenfield	11	40	51	5	45.4	1	15	72	71	0	0
Hyannis	24	80	104	13	54.2	2	29	261	84	0	8
Lawrence	129	90	219	57	44.1	5	91	1,217	89	34	51
Lowell	156	189	345	41	26.3	0	0	1,017	76	24	15
Lynn	249	828	1,077	111	44.2	0	0	2,752	86	14	39
New Bedford	166	357	523	69	41.6	0	0	1,685	66	25	10
Newburyport	25	51	76	6	24.0	4	33	217	68	8	0
North Adams	7	33	40	4	57.2	0	0	181	72	0	0
Pittsfield	10	39	49	2	20.0	0	0	157	91	0	0
Pondville	1,503	7,650	9,153	515	34.2	0	0	–	–	–	–
Quincy	17	54	71	3	17.7	0	0	179	77	24	24
Salem	139	460	599	50	36.0	4	154	1,154	77	14	32
Springfield	90	192	282	19	21.1	0	0	1,583	73	11	42
Westfield	1,229	5,305	6,534	428	34.8	2	87	–	–	–	–
Worcester	297	856	1,153	67	22.5	1	37	2,148	77	15	8
Total	5,117	21,001	26,118	1,782	34.8	39	898				

* Some individuals went to more than one clinic.

TABLE III. — *Massachusetts Cancer Deaths*

Year	Average Age, in Years, of Cancer Deaths	Male Age Adjusted Cancer Death Rate per 100,000*	Female Age Adjusted Cancer Death Rate per 100,000*
1927	62.1	101.2	127.0
1928	62.3	104.1	126.6
1929	62.4	102.7	125.9
1930	62.6	105.7	123.3
1931	62.8	103.0	124.1
1932	62.9	105.8	127.0
1933	63.1	111.2	124.9
1934	63.0	117.6	126.1
1935	63.4	108.5	122.3
1936	63.8	115.0	120.6
1937	64.1	112.4	119.9
1938	63.9	116.9	119.9
1939	64.2	114.0	119.1
1940	64.2	115.3	123.6
1941	64.4	119.3	118.3

*Adjusted to total United States Census Population for 1930.

TABLE IV. — *Median Durations of Delay of Cancer Patients*

Massachusetts State-Aided Cancer Clinics

Year	Median Delay, in Months, between First Symptoms and Visit to Physician	Median Delay, in Months, between First Symptoms and Visit to Clinic
1931	6.7	12.2
1932	6.2	9.3
1933	6.1	9.4
1934	6.2	9.0
1935	6.2	9.3
1936	5.3	8.3
1937	5.7	8.7
1938	5.0	8.0
1939	5.0	8.1
1940	4.6	6.9
1941	4.0	7.0

TABLE V.— *Patients with Cancer Attending State-Aided Cancer Clinics from 1927 to June 30, 1931, Alive 10 Years After Cancer Diagnosis at Clinic, By Location of Cancer*

Location of Cancer	Alive	Dead	Total Population	Percentage Alive		
				Total	Under Age 50 at Clinic Admission	Over Age 50 at Clinic Admission
Buccal cavity	118	297	415	28.4	52.0	25.0
Digestive tract, Respiratory system, Male genitourinary organs	20	257	277	7.2	12.5	5.9
Female genital organs	50	232	282	17.7	22.4	14.5
Breast	66	314	380	17.4	21.6	15.0
Skin	360	374	734	49.0	87.0	44.2
Other and unspecified organs	43	83	126	34.1	39.3	32.2
Total	657	1557	2214			

TABLE VI.— *Percentage of Patients with Cancer Attending State-Aided Cancer Clinics Alive at Yearly Intervals Following Cancer Diagnosis at Clinics*

	Total	Skin*	Others*
Alive 1 year after	65.1	91.2	53.8
Alive 2 years after	51.7	83.2	37.6
Alive 3 years after	44.8	76.1	30.7
Alive 4 years after	40.3	69.9	27.0
Alive 5 years after	36.5	64.5	24.1
Alive 6 years after	33.2	59.9	21.5
Alive 7 years after	30.4	54.7	20.1
Alive 8 years after	27.7	49.5	18.5
Alive 9 years after	26.4	46.8	17.9
Alive 10 years after	24.5	42.9	16.7
Alive 11 years after	21.9	37.5	15.2
Alive 12 years after	19.9	33.8	14.1
Alive 13 years after	18.1	30.7	13.9
Alive 14 years after	13.2	23.3	10.1
Lost or unknown	2.6	5.5	1.9

*Individuals with multiple cancers have been omitted from this tabulation.

TABLE VII.— *Reason for Coming to Clinic, by Diagnosis*

Rate per 100*

REASON	CANCER		PRECANCEROUS LESIONS		ALL OTHERS		TOTAL	
	1940	1941	1940	1941	1940	1941	1940	1941
Physician	86.4	84.3	60.3	60.3	79.9	81.5	80.8	81.4
Past experience or former patient	10.5	10.3	30.0	32.3	8.6	8.0	10.6	10.0
Newspaper	0.6	0.7	1.9	1.6	2.2	1.1	1.6	1.0
Friend or relative	1.2	2.2	3.3	2.7	3.8	3.3	2.9	2.9
Social worker or nurse	1.8	1.7	4.7	1.6	3.5	2.6	3.0	2.2
All others	0.6	2.1	1.1	1.9	2.5	3.9	1.8	3.2

*Does not total 100 per cent, as some individuals gave more than one reason.

TABLE VIII.— *Attendance at State-Aided Cancer Clinics, 1941*

Total individuals attending clinics	4,971
Total individuals having cancer	1,712
Total individuals having precancerous lesions	257
Total individuals having postoperative cancer, no evidence of recurrence	175
Total attendance at clinics	5,117
Total cancer attendance at clinics	1,782
Total precancer attendance at clinics	228
Total postoperative cancer, no evidence of recurrence, attendance at clinics	187
Total diagnoses	5,120
Total cancer diagnoses	1,784
Total precancer diagnoses	257
Total postoperative cancer, no evidence of recurrence, diagnoses	182
Percentage of individuals with cancer	34.4
Percentage of individuals with precancerous lesions	5.2
Median age of total clinic patients	55.7
Median age of cancer patients	63.4

THE DIVISION OF BIOLOGIC LABORATORIES

ELLIOTT S. ROBINSON, M.D., PH.D., *Director*

I. ANTITOXIN AND VACCINE LABORATORY

1. General

The routine production and distribution of biologic products has been maintained at much the usual rate, with no changes in the list. The possibility of war has directed attention towards products needed for national defense, and legislation has been passed to permit the laboratory to prepare and distribute nonsurplus products for military and civilian defense needs.

Licenses were granted by The Federal Security Agency for the manufacture and distribution of immune globulins (placental extract) and of normal serum albumin (human).

2. Distribution of Products

Diphtheria	*1937*	*1938*	*1939*	*1940*	*1941*
Antitoxin, 1,000 unit doses	63,769	56,503	49,538	48,744	44,989
Schick Outfits, 50 doses each	4,905	4,033	3,928	4,136	3,842
Toxin-Antitoxin Mixture, 1 cc. doses	61,530	43,531	43,751	48,945	44,682
Toxoid, 1 cc. doses	274,759	283,139	262,170	251,704	248,003
Toxin (Bulk), cc.	580	1,070	1,885	1,780	1,715
Scarlet Fever					
S.F. Streptococcus Antitoxin, doses	1,893	1,737	1,823	1,405	1,849
S.F. Streptococcus Toxin, 5 cc. vials	636	554	610	391	195
S.F. Streptococcus Toxin, Heated Control, 5 cc. vials	447	386	495	395	186
S.F. Streptococcus Toxoid, 1 cc. doses	25,361	16,121	16,827	11,299	3,618
Pneumonia					
Antipneumococcic Serum, horse, conc. vials	5,800	6,707	6,651	4,037	2,579
Antipneumococcic Serum, horse, (Bulk) c.c.	200	4,427	700	11,550	1,450
Antipneumococcic Serum, rabbit, vials	...	...	193	1,266	1,199*
Diagnostic Serums (of rabbit origin, unless otherwise noted):					
Pneumococcus Type 1 — horse, cc.	235	105	105	15	7
Pneumococcus Type 2 — horse, cc.	245	80	70	10	–
Pneumococcus Type 3 — horse, cc.	230	55	55	15	7
Pneumococcus Type 1, cc.	300	335	237	171	103
Pneumococcus Type 2, cc.	288	271	218	154	92
Pneumococcus Type 3, cc.	276	292	231	162	108
Pneumococcus Type 4, cc.	...	...	35	108	53
Pneumococcus Type 5, cc.	170	264	166	134	91
Pneumococcus Type 7, cc.	134	260	168	142	91
Pneumococcus Type 8, cc.	162	281	190	143	130
Pneumococcus Type 14, cc.	...	...	106	138	53
Pneumococcus, other types	...	...	453	791	796**
Pneumococcus, Pool A, cc.	...	...	256	291	175
Pneumococcus, Pool B, cc.	...	...	260	295	178
Pneumococcus, Pool C, cc.	...	...	217	290	175
Pneumococcus, Pool D, cc.	...	...	206	279	163
Pneumococcus, Pool E, cc.	...	...	201	285	161
Pneumococcus, Pool F, cc.	...	...	205	277	162
Measles					
Placental Extract, vials	2,163	1,304	3,299	3,248	2,666
Sodium Citrate Solution, vials	943	713	535	725	860
Meningitis					
Antimeningococcic Serum, 15 cc. doses	3,339	1,781	1,888	2,201	1,157
Antimeningococcic Serum, Conc. 15 cc. doses	87	2	24	20	51
Influenza (Pfeiffer Bacillus) Antiserum, vials	2,118	2,488	2,796	2,562	1,666
Influenza (Pfeiffer Bacillus) Antiserum, Bulk, cc.	100	...	...	1,200	5,300
Miscellaneous Serums					
Horse Serum, Normal, cc.	87,585	64,600	135,010	173,980	73,150
Enteric Fevers					
Typhoid Vaccine, cc.	54,471	...	...	54,926	45,576
Typhoid-Paratyphoid B vaccine, cc.	15,935	107,426	116,326	45,100	34,377

*5 vials Type 21; 10 vials each Types 10, 22, 28 and 32; 13 vials Type 6; 14 vials Type 15; 15 vials each Types 13, 16, 17; 18 vials Type 11; 19 vials Type 24; 20 vials Types 23 and 31; 21 vials each Types 12 and 27; 28 vials Type 20; 30 vials Type 19; 52 vials Type 29; 60 vials Type 25; 68 vials Type 9; 76 vials each Types 14 and 18; 80 vials Type 2; 222 vials Type 4 and 271 vials Type 3.

**28 vials Type 23; 29 vials each Types 10, 11, 16, 21, 22 and 25; 30 vials each Types 12, 13, 15, 24, 28, 29 and 31; 31 vials each Types 17, 27 and 32; 32 vials each Types 6, 19 and 20; 50 vials Type 18; 59 vials Type 9 and 86 vials Type 33.

Other Products

	1937	1938	1939	1940	1941
Smallpox Vaccine, capillary tubes	244,329	221,576	221,746	233,364	220,638
Tuberculin, ampoules — 0.7 cc.	1,826*	1,821**	1,812	1,769	1,484
Tuberculin, capillary tubes	11,625	12,730	9,185	12,045	9,145
Silver Nitrate Solution, ampoules	76,340	77,488	79,076	83,324	88,800
Serum Sensitivity Outfits	646	947	1,004	1,197	798
Serum Sensitivity Outfits (rabbit)	...	...	...	...	60
Trichina Antigen, ampoules	...	...	...	...	48
Normal Serum Albumin, cc.	...	...	...	...	18,388.5

Syphilis (See also table in report of Division of Genitoinfectious Diseases)

Arsphenamine, 0.4, 0.6, and 3.0 gm. ampoules	3,656	2,625	2,450	2,308	2,183
Sulpharsphenamine, 0.3, 0.6, 1.0# and 3.0 gm. ampoules	6,156	4,329	3,533	3,542	3,509
Neoarsphenamine, 0.3##, 0.45, 0.6, 0.9 gm. ampoules	70,071	67,047	63,490	48,339	36,861
Mapharsen, 0.04, 0.06, 0.4### and 0.6### gm. ampoules	10,855	13,280	21,835	37,465	39,234
Bismuth Salicylate in oil, 10 cc. bottles## and 2 oz. bottles	3,062	5,444	6,663	6,431	6,414
Sulfathiazole, tablets contained in 500 and 1,000 tablet bottles	...	...	...	...	66,500

Products not distributed in 1941

Scarlet Fever Convalescent Serum — 56 vials in 1937 and 3 in 1938
Scarlet Fever Streptococcus Toxin for immunization — 105 1 cc. doses in 1937 and 580 in 1938
Diagnostic Pneumococcus Type 5 Horse Serum — 15 cc. in 1937
Pneumococcus Vaccine, Type 7 — 150 cc. in 1938
Typhus Serum — 1,194 20 cc. vials in 1937
Typhus Serum — 230 cc. in 1937 and 1,000 cc. in 1939
Mumps Convalescent Serum — 110 cc. in 1939
Poliomyelitis Convalescent Serum — 633 vials in 1937 and 75 in 1938
Typhoid-Paratyphoid A and B vaccine — 116,743 cc. in 1937
Diagnostic Typhoid Serum — 12 cc. in 1937
Diagnostic Paratyphoid A serum — 17½ cc. in 1937
Diagnostic Paratyphoid B serum — 17½ cc. in 1937

*Of these ampoules 68 contained 204 cc. in all and 1,758 contained 0.7 cc. each.
**Of these ampoules 15 contained 5 cc. each and 1,806 contained 0.7 cc. each.
#Discontinued in 1937.
##Begun in 1937.
###Begun in 1939.

1. *Antipneumococcic Serum.* Limitation of serum therapy of pneumonia chiefly to patients who fail to respond to chemotherapy has resulted in a further drop in the distribution of this serum.

	Type 1 Units	*Type 2 Units*	*Type 5 Units*	*Type 7 Units*	*Type 8 Units*	*Type 14 Units**
1937	121,060,000	75,880,000	15,139,500	....	....	....
1938	85,550,000	36,524,000	27,384,500	32,280,000	5,640,000	....
1939	85,150,000	35,590,000	28,197,500	38,213,500	28,367,500	3,860,000
1940	54,420,000	27,025,000	22,320,000	23,840,000	22,640,000	3,520,000
1941	28,170,000	15,525,000	26,040,000	19,095,000	15,000,000	1,520,000

*Purchased.

Other types were not distributed prior to 1940, and, therefore, are not given in this table.

2. *Antimeningococcic Serum.* Chemotherapy and a continued low incidence of meningococcus meningitis combine to decrease the use of this product.

3. *Typhoid Vaccines.* An unusually small amount has been distributed, but with no apparent reason for the decrease.

4. *Other products.* Distribution figures are within normal limits.

3. Expenses

Year	Personal Services		Expenses		Total	
	Appropriation	Spent	Appropriation	Spent	Appropriation	Spent
1937	$80,000.00	$77,339.61	$36,813.62	$34,423.30	$116,813.62	$111,762.91
1938	79,350.00	75,821.49	34,570.21	33,474.83	113,920.21	109,296.32
1939	79,300.00	77,524.02	34,496.14	33,561.18	113,796.14	111,085.20
1940	81,700.00	77,323.60	34,628.50	33,169.78	116,328.50	110,493.38
1941	79,500.00	74,748.20	36,774.28	35,896.46	116,274.28	110,644.66

4. *Investigations*

Assistance was rendered the Department of Physical Chemistry, Harvard Medical School, in the preparation of human serum albumin for use as a substitute for blood in transfusions. Laboratory and clinical knowledge concerning this product progressed to the point where a license for its distribution was granted to this laboratory by the Federal Security Agency on August 27, 1941.

II. Wassermann Laboratory

William A. Hinton, M.D., *Chief of Laboratory*

1. *Tests and Examinations*

Kind of Specimen		1937	1938	1939	1940	1941
Blood	Number of Specimens	215,293	254,195	295,114	360,401	425,581
	Tests:					
	Hinton	186,387	223,210	255,589	322,797	389,351
	Wassermann	8,912	6,173	–	–	–
	Davies Micro-Hinton	1,659	3,207	4,072	4,662	4,620
	Bacillus Abortus:					
	Agglutination*	25,431	27,184	29,787	30,380	31,431
	G.C. Compl. Fixation	9,196	10,396	11,101	9,146	679
	Glanders*	39	24	37	22	25
Spinal Fluid	Number of Specimens	8,910	9,740	10,430	11,784	10,934
	Tests:					
	Wassermann	8,911	9,740	10,435	11,784	10,934
	Davies-Hinton	835	3,865	5,097	6,154	8,774
	Gold Sol	546	500	–	–	–
Rabies Diagnosis*	Number of Specimens	460	295	302	306	269
	Tests:					
	Impressions	460	295	302	306	269
	Sections	455	289	296	298	255
	Animal Inoculation	275	230	248	240	232
Path. and Bact. Examinations*	Number of Specimens	7	7	10	8	3
	Tests:					
	Sections	2	4	4	–	–
	Animal Inoculation	5	2	7	1	2
	Cultures	1	1	5	4	2
	Smears	–	2	1	2	1
	Total Tests	243,114	285,122	316,981	385,796	446,575
	Total Specimens	224,670	264,237	305,856	372,496	437,067

*Diagnostic Examinations for Division of Livestock Disease Control.

As shown in the table, the total number of tests performed has increased nearly 16 per cent and in tests for syphilis nearly 20 per cent. This is chiefly attributable to tests for syphilis done for the National Guard and the Selective Service Boards (see below). Performance of the complement fixation test for the detection of gonorrhea was discontinued after February 1941, since it was felt that the test as done at that time was unreliable for such purposes as affect the public health.

2. *Expenses*

Year	Personal Services		Expenses		Total	
	Appropriation	Spent	Appropriation	Spent	Appropriation	Spent
1937	$18,700.00	$18,549.68	$6,000.00	$6,012.02	$24,700.00	$24,561.70
1938	19,000.00	18,973.81	6,000.00	5,992.43	25,000.00	24,966.24
1939	19,300.00	17,093.21	6,200.00	6,177.46	25,500.00	23,270.67
1940	19,650.00	19,085.07	6,322.98	5,956.85	25,972.98	25,041.92
1941	20,050.00	18,164.48	6,332.50	6,248.93	26,382.50	24,413.41

3. Laboratory Approval

In the program for evaluating the performance of laboratories in the serologic detection of syphilis, approximately four hundred different sera have been sent out for testing. Thirty-six institutions have now been approved for testing blood from prospective blood donors, and sixteen institutions for performing routine serologic tests for syphilis. Besides sending specimens to those laboratories seeking approval, we are continuing to send specimens to those laboratories already approved, to ensure that they maintain a satisfactory rating in the performance of these tests.

4. Investigations

Work on the serology of syphilis in rabbits treated with arsphenamine has been continued. The reliability of the complement fixation test for gonorrhea is being reinvestigated at the urgent request of a small group of internists in our Boston hospitals who have expressed a need for this test as an aid in diagnosis in selected cases.

Representatives of the Wassermann Laboratory participated in an evaluation of serologic tests for syphilis held in Washington, D. C., by the American Serologic Congress. They performed the various Hinton technics and their modifications. The Wassermann Laboratory also participated in the regular National Evaluation of Serologic Tests for Syphilis, on invitation of the Surgeon General of the U. S. Public Health Service.

5. New and Proposed Activities

Serologic tests for syphilis on all draftees for the Selective Service System have amounted to 64,262. Tests for syphilis on members of the Massachusetts National Guard were performed on 2,553 specimens.

The performance of serologic tests for syphilis on persons applying for marriage licenses in Massachusetts is a service that has been in operation since November 1, 1941, in response to the new law (Chapter 601 of the Acts of 1941) requiring a medical examination and a blood test on all such persons. The application of this Act will result in many more specimens being submitted to this laboratory.

628 specimens from the American Red Cross Bleeding Clinic have been tested in connection with the serum albumin work at the Antitoxin and Vaccine Laboratory

THE DIVISION OF CHILD HYGIENE

M. Luise Diez, M.D., *Director*

Activities of the Division of Child Hygiene during the year ended December 31, 1941, were chiefly the following:

1. Maternal, Infant and Preschool Hygiene:

New requests for prenatal letters	8,609
Letters sent to fathers	8,609
New requests for postnatal letters, first year series	10,644
Registered for second year postnatal letters	15,515
Total number registered for all monthly letter services	34,768

Follow-up of mothers and babies discharged from Framingham Reformatory for Women continued, through service of Public Health Nursing Supervisors.

Mothers' classes conducted during the year by staff nurses	17
Mothers' classes conducted by local nurses	19
Fathers' classes conducted	3

Prenatal Clinics:

Plan started to secure X-rays of chest for pregnant women attending prenatal clinics. Visitation of local prenatal clinics was continued.

Courses for prenatal clinic physicians	2
Local prenatal clinic service fees paid physician (Westfield)	1

Delivery Nurse Service:

Home delivery nurse service fees paid	27

Maternal Mortality Study:

This year completed the five-year study of causes of maternal deaths in Massachusetts, as well as the study of Caesarean sections occurring in hospitals, carried on through cooperation of the Section of Obstetrics and Gynecology of the Massachusetts Medical Society.

Maternal deaths studies in 1941	220

Premature Infant Program:

The study of deaths of premature infants was continued.

Nursery supervisors taking course on care of premature infant	23

Well Child Conferences:

Physicians taking course for well child conference physicians	6
Well child conference sessions held by State Units	378
Towns covered by this service	67
Number of infant and preschool children examinations	3,583
Nursery school children included in examinations	651
Communities taking over such conferences locally	5
Local well child conferences where fees are paid to physician under Social Security funds	4

Summer Round-up:

Towns conducting Summer Round-Up conferences	139
Total examinations of children in such conferences	9,429

2. School Hygiene:

School physician for the Town of Millville was continued by a staff physician.

School hygiene surveys made	1
"Contact" issues distributed	5
School Physicians' and Superintendents' Conferences held	8

3. Public Health Nursing.

An Institute on "Public Assistance in Massachusetts" was held for nurses and public welfare workers, in seven areas of the State, cooperating with the State Department of Public Welfare. Total attendance 731. Tuberculosis Institutes continued at State and County Sanatoria.

Promotion and stimulation of tuberculosis programs continued in 58 towns, including 83 visits to further tuberculosis nursing program.

Well child conference follow-up visits made	353
Home visits made in communities without nursing service	1,021
Home visits for maternity service	97
Home visits for tuberculosis follow-up	241
Home visits for arthritis study follow-up	31
School nursing survey, as part of school hygiene survey	1
Group conferences held relative to public health nursing	238
Study groups held	10
Toxoid clinics attended	94
Home visits for follow-up of Framingham Reformatory inmates	6
Birth certificates investigated, for Maternal Mortality Study	70
Lectures given on public health nursing subjects	81

Consultant service continued for local nursing associations, county public health associations, community health committees, boards of health, parent-teacher associations, town managers, and other social and lay groups.

Participation in program planning for the three State nursing organizations continued.

4. Nutrition:

Attendance at Fifth Annual Conference of New England Nutritionists	95
Community nutritionists employed locally	7
Nutrition group meetings held	60
Nutrition service at prenatal clinics	16
Visits to tuberculosis clinics	9
Home visits for instruction and follow-up	243
Red Cross nutrition classes conducted	16
Radio talks given	18
Newspaper articles written and published	52
Visits made to further school lunch facilities	360
Number of towns included, school lunch activities	189
Consultant and field service for out-of-state workers	21

Members of the nutrition staff served on national, state and local committees concerned with promotion of adequate nutrition.

Cooperation continued with State Departments of Education, Public Welfare, the Extension Service, Red Cross, Girl Scouts, and State Public Safety Committee. Summer courses continued at State Teachers Colleges for teachers, nurses and school lunchroom managers.

5. Dental Hygiene:

Dental surveys made in schools in 11 towns:

Number of children included in examinations	1,516
School hygiene dental survey made	1
Dental survey of camp children	1
Number of children included in this survey	164
Lectures to student nurses in training in hospitals	17
Dental examinations at well child conferences	12
Dental inspections at well child conferences	3,377

Participation in courses at Harvard School of Public Health, Harvard Dental School, Boston University Medical School, Tufts Dental School and Forsyth Dental Infirmary continued.

An eight-session course for dentists, in Children's Dentistry, was conducted in cooperation with the American Society for Children's Dentistry. This included lectures and demonstrations. Sixteen dentists took the course.

Cooperation and consultation service continued for national, state and local dental societies, and assistance was given the State Welfare Department in securing dental service for State wards.

6. Parent Education:

Parent education courses were continued for teachers and nurses. Courses were given at Fitchburg State Teachers College, for advanced credit, a total of 10 lectures on "Problems of Adolescence."

The second course for lay leaders in Parent Education was carried on. These leaders carried on locally 27 community projects, supervised by the Parent Education Coordinator.

Annotated book lists were prepared and consultation service given.

7. Child Growth and Development Service:

A program of case studies of preschool and school children was developed cooperating with the school superintendents in selected communities. Methods and techniques for hearing testing of preschool children were studied and plans made for perfecting these methods. The Clarke School for the Deaf and Massachusetts Eye and Ear Infirmary cooperated in this work.

The Massachusetts Vision Test was approved by both State Departments of Education and Public Health, and introduced to the schools of the State. Reports were completed of studies and test materials.

8. Social Work:

A study of economic and social factors involved in behavior problems reported from well child conferences by Department Units was carried on and is to be continued. A study of social resources, public and private, in small towns was made to form the basis of a permanent file of social resources.

Monthly group discussions for nurses were held in three centers. Consultation service was given directly and through group discussion of case problems.

9. Audiometer Testing:

Three audiometers were in constant use during the year.

Number of children having hearing tests by audiometer	41,580
Number showing hearing loss	1,750
Number requiring retesting	5,990

10. Health Education:

Health talks given in high Schools	158
Number of high school pupils reached through this service	31,564
Number of communities where high school health study was conducted	45
Health exhibits at State Fairs	12
Exhibits at special conferences	11
Printed material distributed through State Fairs (pieces)	17,621
Pamphlets distributed through Boston Book Fair	12,779
Pamphlets distributed through schools	216,640
Lectures given by staff members	1,147
Communities reached through this service	212
Total number of persons reached	83,493

Cooperating with the University Extension Division, courses were given to teachers and school nurses. The Health Education Coordinator participated in a course at Forsyth Dental Infirmary. Other staff members participated in courses at Harvard School of Public Health, Harvard Dental School and Massachusetts General Hospital; also Fitchburg and Hyannis State Teachers Colleges. In-service training in health education was carried on for Board of Health nurses and dental hygienist and the visiting nurse association of Springfield. A workshop in health education was conducted for teachers in 9 towns.

A special School Health Study was begun this year, under the supervision of the Joint Committee on Health Education, sponsored by the State Departments of Education and Public Health and the School Superintendents' Association, School Principals' Association, and representatives of State medical and dental societies.

The Division participated in health exhibits for Massachusetts Medical Society, New England Health Institute, Public Welfare Convention, Boston Book Fair, State Nurses' Association, and county and local health associations.

"Illustrative Teaching Methods" for grades I, II, III, IV, V, and VI, were printed, in cooperation with the State Department of Education.

Staff education through special courses and field observation trips was afforded to various staff members.

The usual advisory committees were called upon during the year for advice and counsel.

Massachusetts Statistics for 1941
(Allocated)

Birth rate per 1,000 population	16.2
Death rate per 1,000 population	11.7
Infant mortality rate per 1,000 live births	35.3
Maternal mortality rate per 1,000 live births	2.9
Population estimated as of June 30, 1941	4,325,106

THE DIVISION OF COMMUNICABLE DISEASES

ROY F. FEEMSTER, M.D., Dr. P.H., *Director*

GENERAL STATEMENT

Although only statistical tables are included in this summary, a number of the activities of the division are touched upon in the Commissioner's section.

Discovery of Typhoid Carriers

Year	Cases of Typhoid	Carriers Added to List	Rate per 100 Cases	Carriers Found in Investigation of Cases	Rate per 100 Cases	Epidemiological Units#	Per Cent of Units in Which Carrier Was Found
1937	114	20	17.5*	16	14.0	96**	16.7
1938	59	19	32.2*	16	27.1	55**	29.1
1939	78	26	33.3*	21	26.9	66**	31.8
1940	86	19	22.1*	12	13.9	59**	20.3
1941	68	22	32.4*	18	26.4	63**	28.6

#All cases resulting from the same source are counted as a single unit in this column.

*No adjustment has been made for those cases in which disease was probably contracted outside of state numbering as follows: 1937 — 10; 1938 — 2; 1939 — 5; 1940 — 3; 1941 — 3.

**1937 — 1 unit comprising 1 case caused by known carrier.
1938 — 1 unit comprising 1 case caused by known carrier.
1939 — 2 units comprising 2 cases caused by known carriers.
1940 — 6 units comprising 11 cases caused by known carriers.
1941 — 4 units comprising 9 cases caused by known carriers.

OUTBREAKS

Disease	Month	Location	Cases	Vehicle	Diagnosis Confirmed by Lab. Work	Etiological Agent	Remarks
Diphtheria	Mar.	Springfield	7 (4 rept.)	U*	5	–	In family of 11 children (4 clinical and 3 subclinical)
Dysentery	June	Lynn	12	U	12	Flexner	–
Dysentery	July	Dunstable	106	U	106	Flexner	Summer camp.
Dysentery	July	Middleborough	40	U	12	Sonne	Summer camp.
Dysentery	July–Nov.	Worcester State Hospital	84	U	84	Sonne	–
Dysentery	July–Dec.	Fernald State School	26	U	26	Flexner	–
Dysentery	Sept.	Ipswich	Several	U	5	Flexner	In 2 families on dairy farms.
Dysentery	Oct.	Ayer	18	U	4	Flexner	–
Dysentery	Oct.	Melrose	10	U	7	Flexner	Employees in hospital.
Food Poisoning	Dec.	Fall River	8	Muffins	Yes	Sodium fluoride	Muffins served in restaurant.
Gastroenteritis	Jan.	Boston	110	Roast turkey?	–	U*	Banquet.
Gastroenteritis	Feb.	Weymouth	5	U	–	U	In 1 household of 6 persons.
Gastroenteritis	May	Andover	9	U	–	U	In 1 household of 14 persons.
Gastroenteritis	May	Andover	5	U	–	U	5 of 13 employees.
Gastroenteritis	June	Fall River	Many	Water?	–	U	Contaminated water supply in factory.
Gastroenteritis	June	Worcester State Hospital	322	Hamburg and spaghetti	–	U	–
Gastroenteritis	July	Salisbury	40	Water?	–	–	Summer residents.
Gastroenteritis	July	S.S. Washington	Few	Contact	–	U	Refugees.
Gastroenteritis	July	Pembroke	60	Salmon salad?	–	Staph. aureus and albus	Girls' summer camp.
Gastroenteritis	Aug.	Boston	9	U	–	–	At Fort Dawes.
Gastroenteritis	Aug.	Haverhill	Several	U	–	U	Newborn infants in hospital.[1]
Gastroenteritis	Aug.	Plymouth	135	Chop suey?	–	Probably staph.ent.	Camp at Manomet.

*U—Undetermined mode of transmission or etiological agent.

OUTBREAKS — *Continued*

Disease	Month	Location	Cases	Vehicle	Diagnosis Confirmed by Lab. Work	Etiological Agent	Remarks
Gastroenteritis	Aug.	Windsor	Few	U	–	U	Members of 5 families residing on large farm.
Gastroenteritis	Oct.	Natick-Newton	4	Chocolate eclairs	–	Staph. ent.	–
Gastroenteritis	Oct.	Northampton	6	U	–	U	College students.
Gastroenteritis	Oct.	Pittsfield	Several	Eclairs	–	Staph. ent.	In different families.
Gastroenteritis	Oct.	Worcester	30	Roast turkey?	–	Probably staph. ent.	Banquet
Gastroenteritis	Nov.	Boston	10	Cream-filled pastry	–	Staph. ent.	Pastry bought at restaurant.
Gastroenteritis	Nov.	Williamstown	17	U	–	U	Private school.
Gastroenteritis	Dec.	Weymouth	13	U	–	U	Newborn infant in hospital.
Infectious jaundice	Sept.	W. Brookfield	10	U	No		–
Meningitis	June	Camp Edwards	8	–	8	Meningococcus	–
Salmonella	Apr.	Metropolitan State Hospital	9	U	9	Montevideo, 7 Urbana, 1 Oranienburg, 1	Among inmates.
Salmonella	May	Malden	4	U	4	Typhimurium	Family group.
Scarlet fever	Mar.–Apr.	Boston-Winthrop	15	–	–	–	At Fort Banks.
Scarlet fever, sore throat	July	Burlington	81	Ham	15	Hemol. strep. type 2.	Church luncheon.
Scarlet fever, sore throat	Aug.	Foxborough State Hospital	7	U	–	–	7 cases on 4 different wards.
Trichinosis	Feb.	Framingham	4	Pork chops	–	–	1 family.
Trichinosis	June	Camp Edwards	14	U	–	–	–
Trichinosis	Dec.	Attleboro	5	U	–	–	1 family.
Typhoid	May	Boston	3	Water	3	–	Boys drank standing surface water Typhoid carrier lived nearby.
Undulant fever	Mar.-Sept.	Leominster	16	Raw milk	16	Br. abortus	All cases drank raw milk from 1 dairy.

*U—Undetermined mode of transmission or etiological agent.

TABLE I.— *Anterior Poliomyelitis*

YEAR	Cases	Case Rate per 100,000	Deaths	Death Rate per 100,000	Fatality Rate (Per Cent)
1937	351	8.0	22	0.5	6.3
1938	18	0.4	7	0.1	38.9
1939	76	1.7	4	0.1	5.3
1940	45	1.0	2	0.04	4.4
1941	182	4.2	6	0.1	3.3

TABLE II.— *Diphtheria*

1937	175	4.0	18	0.4	10.3
1938	159	3.6	19	0.4	11.9
1939	197	4.4	15	0.3	7.6
1940	144	3.3	8	0.2	5.6
1941	123	2.8	12	0.3	9.8

TABLE III.— *Measles*

1937	21,136	479.9	28	0.6	0.1
1938	10,533	238.0	13	0.3	0.1
1939	26,685	600.1	16	0.3	0.1
1940	21,698	502.6	11	0.3	0.1
1941	22,338	516.5	4	0.1	...

TABLE IV.— *Meningitis, Meningococcal*

YEAR	Cases	Case Rate per 100,000	Deaths	Death Rate per 100,000	Fatality Rate (Per Cent)
1937	166	3.8	72	1.6	43.4
1938	59	1.3	18	0.4	30.5
1939	48	1.1	17	0.4	35.4
1940	47	1.1	15	0.3	31.9
1941	98	2.3	25	0.6	25.5

TABLE V.— *Pneumonia, Lobar*

1937	5,322	120.8	1,846	41.9	34.7
1938	4,296	97.1	1,312	29.6	30.5
1939	4,460	100.3	1,211	27.2	27.1
1940	4,332	100.4	925	21.4	21.4
1941	3,617	83.6	860	19.9	23.8

TABLE VI.— *Scarlet Fever*

1937	8,480	192.5	38	0.9	0.4
1938	10,146	229.3	24	0.5	0.2
1939	5,705	128.3	15	0.3	0.3
1940	5,277	122.2	19	0.4	0.4
1941	7,141	165.1	13	0.3	0.2

TABLE VII.— *Tuberculosis, Pulmonary*

1937	3,534	80.2	1,761	40.0	...
1938	3,220	72.8	1,536	34.7	...
1939	2,959	66.5	1,505	33.8	...
1940	2,816	65.2	1,484	34.4	...
1941	2,987	69.1	1,520	35.1	...

TABLE VIII.— *Tuberculosis, Nonpulmonary*

1937	363	8.2	126	2.9	...
1938	375	8.5	141	3.2	...
1939	310	7.0	97	2.2	...
1940	294	6.8	114	2.6	...
1941	295	6.8	112	2.6	...

TABLE IX.— *Typhoid Fever*

1937	114	2.6	13	0.3	11.4
1938	59	1.3	11	0.2	18.6
1939	78	1.7	11	0.2	14.1
1940	86	2.0	8	0.2	9.3
1941	68	1.6	3	0.1	4.4

TABLE X.— *Whooping Cough*

1937	13,333	302.7	95	2.1	0.7
1938	5,818	131.5	35	0.8	0.6
1939	7,548	169.7	45	1.0	0.6
1940	7,959	184.4	22	0.5	0.3
1941	9,790	226.4	40	0.9	0.4

TABLE XI.— *Number and Kind of Specimens*

	1937	*1938*	*1939*	*1940*	*1941*
Diphtheria	6,104	6,923	7,104	6,614	5,463
Gonorrhea	13,621	12,725	12,942	13,070	12,590
Malaria	48	58	51	50	48
Pneumonia	1,950	3,602	3,965	3,608	3,207
Tuberculosis	5,186	6,392	6,479	7,565	6,937
Typhoid Fever:					
Widal	3,713	2,642	3,311	3,037	2,730
Culture	9,268	7,852	12,766	12,814	11,019
Undulant Fever	1,393	1,871	1,933	1,966	2,686
Miscellaneous	1,911	1,147	1,018	1,368	1,699
Total	43,194	43,212	49,569	50,092	46,379

TABLE XII.— *Specimens and Examinations for 1941*

	Positive	Negative	Total Number of Specimens	Total Number of Examinations
Diphtheria:				
Diagnosis	53	4,729	4,782	11,788[1]
Release	139	542	681	681
Gonorrhea	1,251	11,339	12,590	25,180[2]
Malaria	–	48	48	48
Meningococci, Spinal fluid for	9	43	52	96[3]
Pneumonia:				
Pneumococci found and typed	1,094	–	1,094	1,094
Pneumococci not found	–	2,113	2,113	2,213
Tuberculosis:				
Sputum	576	5,624	6,200	6,200
Urine, spinal fluid, etc. (Culture and animal inoculations)	80	657	737	737
Typhoid Fever:				
Widal	80	2,650[4]	2,730	5,899[5]
Culture (blood, feces, urine, etc.)	317	10,702	11,019	17,046[6]
Undulant Fever	177	2,509	2,686	8,058[7]
Miscellaneous:				
Diphtheria virulence tests	20	3	23	23
Dysentery agglutination tests	1	155	156	156
Dysentery, Amoebic	–	54	54	54
Vincent's angina (sent by dentists)	709	312	1,021	1,021
Weil-Felix reaction for Rickettsial diseases	16	99	115	115
Unclassified	–	–	278	413[8]
			46,379	80,822

[1]Includes examinations for hemolytic streptococci and the organisms of Vincent's angina.
[2]Includes examinations for average number of leucocytes per field.
[3]Includes examinations for influenza bacilli and other organisms.
[4]Includes 194 partial reactions.
[5]Includes 439 agglutination tests for paratyphoid A and 2,730 tests for paratyphoid B.
[6]Includes examinations for paratyphoid and dysentery bacilli.
[7]Includes examinations for agglutinins for typhoid and paratyphoid B.
[8]Includes miscellaneous examinations for identification of organisms.

TABLE XIII.— *Pneumococcus Type Differentiation*

Type	Number	Per Cent	Type	Number	Per Cent
1	93	8.1	20	37	3.2
2	31	2.7	21	13	1.1
3	150	13.1	22	12	1.0
4	56	4.9	23	27	2.4
5	34	3.0	24	22	1.9
6	62	5.4	25	3	0.3
7	65	5.7	27	4	0.4
8	92	8.0	28	16	1.4
9	26	2.3	29	41	3.6
10	22	1.9	31	9	0.8
11	37	3.2	32	1	0.1
12	8	0.7	33	28	2.4
13	29	2.5	Buckley	16	1.4
14	25	2.2	Carver	13	1.1
15	26	2.3	Dougherty	1	0.1
16	17	1.5	Reilly	10	0.9
17	27	2.4			
18	27	2.4	Typed pneumococci	1,144	100.0
19	64	5.6	No pneumococci	2,113	
			Total	3,257[1]	

[1]71 specimens with more than one type.

TABLE XIV.— *Laboratory Examinations for Rabies**

YEAR	POSITIVE		NEGATIVE	TOTAL ANIMALS EXAMINED
	Dogs	Other Animals		
1937	158	6	247	460
1938	49	1	233	255
1939	31	1	264	304
1940	52	4	244	309
1941	20	1	240	274

*Wassermann Laboratory.

Cases and Deaths, with Case and Death Rates per 100,000 Population[1] for Reportable Diseases During the Year 1941

DISEASE	CASES	CASE RATE PER 100,000 POPULATION	DEATHS	DEATH RATE PER 100,000 POPULATION	FATALITY RATE (PER CENT)
Actinomycosis	4	.1	2	*	50.0
Anterior poliomyelitis	182	4.2	6	.1	3.3
Anthrax	7	.2	1	*	14.3
Chicken pox	11,808	273.0	4	.1	*
Diphtheria	123	2.8	12	.3	9.8
Dog bite	11,038	255.2	–	–	–
Dysentery, Amebic	4	.1	–	–	–
Dysentery, Bacillary	303	7.0	6	.1	2.0
Encephalitis, Infectious	21	.5	13	.3	61.9
German measles	2,334	54.0	–	–	–
Gonorrhea	3,791	87.7	7	.2	.2
Malaria	10	.2	1	*	10.0
Measles	22,338	516.5	4	.1	*
Meningitis, Meningococcal	98	2.3	25	.6	25.5
Meningitis, Pfeiffer bacillus	14	**	21	.5	**
Meningitis, Other forms	22	***	–	–	–
Mumps	10,491	242.6	6	.1	.1
Ophthalmia neonatorum	481	11.1	–	–	–
Suppurative Conjunctivitis	492	11.4	–	–	–
Paratyphoid infections	77	1.8	1	*	1.3
Pellagra	18	.4	7	.2	38.9
Pneumonia, Lobar	3,617	83.6	860	19.9	23.8
Scarlet fever	7,141	165.1	13	.3	.2
Septic sore throat	171	4.0	22	.5	12.9
Syphilis	4,613	106.7	267	6.2	5.8
Tetanus	19	.4	5	.1	26.3
Trachoma	24	.6	–	–	–
Trichinosis	50	1.2	–	–	–
Tuberculosis, Pulmonary	2,987	69.1	1,520	35.1	50.9
Tuberculosis, Other forms	295	6.8	112	2.6	38.0
Tuberculosis, Hilum	184	4.3	–	–	–
Tularemia	1	*	–	–	–
Typhoid fever	68	1.6	3	.7	4.4
Typhus	2	*	–	–	–
Undulant fever	86	2.0	2	*	2.3
Whooping cough	9,790	226.4	40	.9	.4
Total	92,704	2,143.4	2,960	68.4	

[1]Population, 4,325,108.
*Less than .05.
**Incompletely reported.
***Made reportable May, 1941.

Cases and Deaths for all Reportable Diseases by Months — 1941

	Jan.		Feb.		March		April		May		June		July		August		September		October		November		December		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Actinomycosis	–	–	–	–	–	1	–	–	–	–	–	–	–	–	1	–	–	–	2	1	1	–	–	–	4	2
Anterior poliomyelitis	–	–	–	–	1	–	1	–	–	–	1	–	5	–	45	2	66	2	46	1	10	1	7	–	182	6
Anthrax	–	–	1	–	–	–	–	–	–	–	2	1	–	–	1	–	–	–	2	–	–	–	1	–	7	1
Chicken pox	1574	–	1103	–	1408	–	1181	1	1276	1	1170	1	519	–	125	–	106	–	571	–	1172	–	1603	1	11808	4
Diphtheria	9	1	6	–	8	–	14	1	9	–	11	–	9	1	6	1	10	–	8	3	14	2	19	3	123	12
Dog bite	511	–	531	–	655	–	1286	–	1259	–	1265	–	1286	–	998	–	1153	–	857	–	687	–	550	–	11038	–
Dysentery, Amebic	–	–	–	–	1	–	1	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–	4	–
Dysentery, Bacillary	3	–	12	–	3	–	1	–	2	1	14	–	24	–	29	2	110	2	43	–	46	–	16	1	303	6
Encephalitis, infectious	1	1	1	–	2	1	3	2	–	3	2	1	1	–	3	3	2	–	2	1	3	1	1	–	21	13
German measles	63	–	89	–	147	–	523	–	640	–	535	–	116	–	31	–	28	–	35	–	59	–	68	–	2334	–
Gonorrhea	263	–	282	1	324	–	315	–	319	2	302	–	344	–	283	1	403	2	351	–	332	–	273	1	3791	7
Malaria	–	–	5	–	1	–	1	–	1	–	1	–	–	–	1	1	–	–	–	–	–	–	–	–	10	1
Measles	1887	1	1896	–	3126	–	4012	–	4118	1	3923	2	1420	–	281	–	168	–	373	–	456	–	678	–	22338	4
Meningitis, meningococcal	3	1	6	2	10	5	6	2	8	5	16	3	5	–	3	2	8	1	8	2	14	1	11	1	98	25
Meningitis, Pfeiffer bacillus	3	3	–	3	1	1	1	1	–	1	1	4	2	2	1	–	–	–	1	1	2	1	2	4	14	21
Meningitis, pneumococcal**											–	–	5	–	2	–	2	–	1	–	3	–	4	–	17	–
Meningitis, other forms**											–	–	1	–	1	–	–	–	1	–	2	–	–	–	5	–
Mumps	836	1	696	–	1349	–	1492	–	1479	3	1113	–	533	–	273	1	233	–	335	–	692	1	1460	–	10491	6
Ophthalmia neonatorum*	158	–	82	–	83	–	109	–	76	–	56	–	100	–	60	–	59	–	59	–	49	–	82	–	973	–
Paratyphoid infections	5	–	4	–	3	–	7	–	23	–	5	–	4	–	9	–	2	–	6	–	5	–	4	1	77	1
Pellagra	1	–	2	–	–	1	1	1	1	–	1	–	2	1	2	–	3	–	–	2	3	–	2	2	18	7
Pneumonia, lobar	1052	218	461	103	369	102	390	75	210	66	207	36	155	35	74	22	106	32	192	40	193	60	208	71	3617	860
Scarlet fever	586	–	528	1	650	2	874	5	823	–	639	2	232	–	195	1	243	–	466	1	734	1	1171	–	7141	13
Septic sore throat	16	3	26	2	23	–	23	1	19	1	16	–	8	1	3	1	2	1	11	7	8	2	16	3	171	22
Syphilis	296	32	344	18	462	24	419	26	437	24	391	22	388	16	341	24	361	27	450	16	389	23	335	15	4613	267
Tetanus	–	–	1	–	–	–	1	–	3	1	5	2	1	–	1	–	1	–	1	1	3	–	2	1	19	5
Trachoma	3	–	4	–	3	–	2	–	1	–	1	–	1	–	2	–	1	–	3	–	2	–	1	–	24	–
Trichinosis	1	–	6	–	1	–	1	–	–	–	15	–	–	–	2	–	8	–	2	–	2	–	12	–	50	–
Tuberculosis, pulmonary	269	166	176	136	285	134	268	132	303	124	264	126	204	133	260	90	229	109	289	110	199	128	241	132	2987	1520
Tuberculosis, other forms	26	9	12	11	27	5	25	11	30	10	22	11	28	16	24	11	23	5	29	6	23	8	26	9	295	112
Tuberculosis, hilum	15	–	11	–	21	–	20	–	11	–	24	–	9	–	20	–	5	–	11	–	10	–	27	–	184	–
Tularemia	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–
Typhoid fever	4	–	3	–	3	1	1	–	9	–	7	–	4	–	8	–	7	–	11	–	2	1	9	1	68	3
Typhus fever	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
Undulant fever	5	–	5	–	6	–	13	–	12	–	6	1	4	–	13	–	8	–	6	–	5	–	3	1	86	2
Whooping cough	1076	3	930	4	969	6	807	4	1157	2	978	2	659	6	575	6	546	3	555	2	710	1	828	1	9790	40
Total	8666	439	7223	281	9942	283	11799	262	12226	245	10994	214	6069	211	3674	168	3893	184	4727	194	5830	231	7661	248	92704	2960

* Includes suppurative conjunctivitis figures.

** Made reportable May 13, 1941.

Cases of Reportable Diseases by Ages for 1941

Disease	Under 1 Year	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 to 14 years	15 to 19 years	20 to 24 years	25 to 29 years	30 to 39 years	40 to 49 years	50 to 59 years	60 to 69 years	70 years and over	Age Unknown	Total	Male	Female
Actinomycosis	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4	–	–	–	–	4	3	1
Anterior poliomyelitis	3	5	10	16	9	24	11	9	11	7	33	16	9	5	12	2	–	–	–	–	182	116	66
Anthrax	–	–	–	–	–	–	–	–	–	–	–	1	2	1	1	1	–	1	–	–	7	6	1
Chicken pox	338	468	594	726	911	1373	2188	1514	1130	623	1111	179	66	48	52	16	5	–	1	465	11808	6233	5575
Diphtheria	–	5	9	12	15	8	10	11	8	6	15	6	1	3	4	4	2	2	–	–	123	65	58
Dysentery, Amebic	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	2	–	1	–	4	1	3
Dysentery, Bacillary	1	5	5	2	1	5	7	4	21	19	60	37	17	6	25	21	22	19	26	–	303	186	117
Encephalitis, Infectious	–	1	–	–	4	2	–	1	–	2	2	3	1	1	2	1	1	–	–	–	21	9	12
German measles	51	93	76	72	48	83	123	119	107	76	373	485	353	122	59	9	3	–	–	82	2234	1332	1002
Gonorrhea	8	1	6	6	3	5	1	2	8	4	10	339	1287	928	792	259	84	26	3	19	3791	3006	785
Hookworm	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Leprosy	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Malaria	–	–	–	–	–	–	–	–	–	–	–	–	2	–	2	5	1	–	–	–	10	8	2
Measles	420	1020	1262	1677	1864	2601	3634	2832	1891	1167	2100	547	249	118	93	25	8	5	3	822	22338	11736	10602
Meningitis, Meningococcal	13	7	4	3	3	1	1	1	4	1	6	8	12	13	10	5	4	2	–	–	98	62	36
Meningitis, Pfeiffer bacillus	6	1	3	1	–	–	1	–	–	–	–	–	–	–	1	–	1	–	–	–	14	11	3
Mumps	32	158	255	424	564	948	1575	1274	1147	739	1984	442	171	120	196	76	26	13	7	340	10491	5742	4749
Paratyphoid infections	4	4	1	–	2	1	2	–	2	1	7	8	4	3	5	17	5	7	4	–	77	44	33
Pellagra	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	4	8	3	2	–	18	13	5
Pneumonia, Lobar	95	58	72	49	46	50	45	33	24	25	115	159	179	177	410	456	529	498	467	130	3617	2190	1427
Rabies	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Rocky Mountain spotted fever	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Scarlet fever	36	133	315	466	585	715	844	659	562	472	1318	338	173	113	152	48	16	7	2	187	7141	3652	3489
Septic sore throat	1	3	4	2	2	5	6	6	4	4	23	11	31	14	25	15	11	2	2	–	171	70	101
Smallpox	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Syphilis	15	3	2	2	1	7	6	7	4	8	39	129	439	517	978	1008	882	436	95	35	4613	2794	1819
Tetanus	1	–	1	–	1	1	1	1	2	–	3	2	2	1	–	–	1	1	1	–	19	16	3
Trachoma	–	–	–	–	–	1	–	–	1	–	3	1	–	1	–	5	7	3	2	–	24	16	8
Trichinosis	–	–	–	–	–	–	–	–	2	1	3	7	16	7	7	5	2	–	–	–	50	30	20
Tuberculosis, Pulmonary	3	3	10	5	5	6	3	2	4	3	32	187	333	309	532	482	412	239	124	293	2987	1825	1162
Tuberculosis, Other forms	3	9	8	5	4	4	6	3	3	4	18	30	20	30	35	38	28	21	10	16	295	126	169
Tuberculosis, Hilum	2	2	3	5	7	4	7	11	5	6	37	15	14	13	21	13	6	4	1	8	184	84	100
Tularemia	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	1	–
Typhoid fever	–	–	–	2	1	2	2	3	3	1	8	11	8	6	11	3	6	1	–	–	68	37	31
Typhus fever	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	2	1	1
Undulant fever	–	–	–	1	–	1	–	1	1	1	2	4	10	11	22	12	9	7	4	–	86	54	32
Whooping cough	654	741	908	986	1060	1040	1383	957	575	342	533	55	13	19	29	11	2	4	6	472	9790	4816	4974

Cases of Reportable Diseases by Counties — 1941

Disease	Barnstable	Berkshire	Bristol	Dukes	Essex	Franklin	Hampden	Hampshire	Middlesex	Nantucket	Norfolk	Plymouth	Suffolk	Worcester	Total
Actinomycosis	–	–	–	–	–	–	1	–	2	–	–	–	1	–	4
Anterior poliomyelitis	6	6	36	–	27	–	6	6	32	–	11	17	18	17	182
Anthrax	–	–	–	–	3	–	2	–	1	–	–	–	–	1	7
Chicken pox	60	162	481	–	1,672	379	926	130	2,604	1	892	344	2,905	1,252	11,808
Diphtheria	1	–	52	–	7	–	9	–	20	–	6	2	21	5	123
Dog bite	102	163	432	–	1,545	69	558	103	2,811	8	947	245	3,120	935	11,038
Dysentery, Amebic	–	–	–	–	–	–	–	–	–	–	–	–	2	2	4
Dysentery, Bacillary	–	1	4	–	45	–	2	5	163	–	1	1	10	71	303
Encephalitis, Infectious	–	–	5	–	2	–	3	–	5	–	1	2	1	2	21
German measles	247	33	76	1	219	40	97	116	546	–	126	129	388	316	2,334
Gonorrhea	163	58	200	4	301	26	285	15	909	1	116	109	1,431	173	3,791
Malaria	–	–	–	–	1	–	–	–	–	–	6	–	3	–	10
Measles	370	89	183	–	721	122	1,159	272	6,750	1	1,912	1,057	7,008	2,694	22,338
Meningitis, Meningococcus	12	1	11	–	6	–	3	2	13	–	12	9	13	16	98
Mumps	63	164	462	–	1,230	174	406	48	2,187	–	944	690	2,702	1,421	10,491
Ophthalmia neonatorum*	15	3	82	–	21	–	53	2	97	–	8	108	535	49	973
Paratyphoid infections	–	2	–	–	19	–	–	1	39	–	5	–	8	3	77
Pellagra	–	–	1	–	1	–	–	–	1	–	1	–	10	4	18
Pfeiffer bacillus meningitis	–	–	1	–	3	–	3	1	3	–	–	1	–	2	14
Pneumonia, Lobar	66	31	123	–	405	11	239	75	919	–	284	98	935	431	3,617
Scarlet fever	69	92	526	–	441	55	817	39	1,667	–	493	495	1,763	684	7,141
Septic sore throat	–	2	21	–	26	6	5	–	29	–	5	7	65	5	171
Syphilis	64	78	332	13	425	18	355	46	862	6	240	168	1,728	278	4,613
Tetanus	–	–	3	–	3	–	–	–	4	–	2	3	2	2	19
Trachoma	–	–	3	–	4	–	1	–	5	–	1	–	7	3	24
Trichimosis	17	–	7	–	2	–	–	–	8	–	–	1	12	3	50
Tuberculosis, Pulmonary	16	44	224	3	267	14	175	30	603	1	203	81	1,053	273	2,987
Tuberculosis, Other forms	4	4	27	1	29	–	17	4	64	–	13	9	97	26	295
Tularemia	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1
Typhoid fever	1	1	4	–	6	1	6	–	11	–	5	4	22	7	68
Typhus fever	–	–	–	–	–	–	–	1	1	–	–	–	–	–	2
Undulant fever	1	8	3	–	4	6	1	2	14	–	4	6	2	35	86
Whooping cough	94	104	471	–	1,048	14	553	45	2,669	–	820	617	2,445	910	9,790

*Includes suppurative conjunctivitis.

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Sheffield	233
Shelburne	239
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Somerset	121
Somerville	8
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Southampton	286
Southborough	206
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Southwick	243
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Stockbridge	226
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Stoughton	84
Stow	266
Sturbridge	203
Sudbury	225
Sunderland	273
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Walpole	101
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West Springfield	47
West Stockbridge	276
West Tisbury	334
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Westfield	46
Westford	146
Westhampton	321
Westminster	211
Weston	150
Westover Field	363
Westport	142
Westwood	154
Weymouth	35
Whately	283
Whitman	94
Wilbraham	168
Williamsburg	238
Williamstown	137
Wilmington	131
Winchendon	110
Winchester	57
Windsor	330
Winthrop	49
Woburn	44
Worcester	3
Worthington	311
Wrentham	129
Yarmouth	198

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1941	Anterior Poliomyelitis		Chicken Pox		Diphtheria		Dog Bite		German Measles		Gonorrhea	
			Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
1	Massachusetts	4,325,108	182	6	11808	4	123	12	11038	–	2334	–	3791	7
	Cities of over 500,000													
2	Boston	769,520	16	1	2841	–	16	2	2873	–	362	–	1199	–
	Cities of over 150,000													
3	Worcester	193,493	6	–	636	–	2	–	593	–	191	–	74	–
	Cities of 100,000–150,000	*689,039*	*39*	*1*	*1910*	*1*	*62*	*8*	*1484*	–	*216*	–	*536*	*1*
4	Springfield	149,510	3	–	623	–	7	2	278	–	62	–	175	–
5	Fall River	115,445	3	–	229	–	48	3	157	–	19	–	51	–
6	Cambridge	110,534	8	–	818	–	1	1	551	–	89	–	87	–
7	New Bedford	110,060	18	1	70	–	1	–	101	–	32	–	101	1
8	Somerville	101,960	6	–	82	1	3	–	191	–	11	–	77	–
9	Lowell	101,530	1	–	88	–	2	2	206	–	3	–	45	–
	Cities and Towns of 50,000–100,000	*615,706*	*27*	*1*	*1606*	*1*	*3*	*1*	*1617*	–	*177*	–	*330*	*1*
10	Lynn	97,600	7	–	396	–	–	–	331	–	28	–	74	–
11	Lawrence	84,235	1	1	76	–	–	–	132	–	6	–	66	–
12	Quincy	76,285	5	–	436	–	–	–	211	–	16	–	29	–
13	Newton	70,446	2	–	222	–	–	–	186	–	46	–	38	–
14	Medford	63,500	2	–	97	–	1	1	148	–	10	–	26	–
15	Brockton	62,162	8	–	146	–	–	–	107	–	25	–	23	1
16	Malden	58,005	2	–	97	1	1	–	249	–	26	–	35	–
17	Holyoke	53,403	–	–	41	–	–	–	100	–	5	–	26	–
18	Brookline	50,070	–	–	95	–	1	–	153	–	15	–	13	–
	Cities and Towns of 25,000–50,000	*574,207*	*21*	–	*1055*	–	*16*	*1*	*1407*	–	*113*	–	*301*	*1*
19	Pittsfield	49,684	4	–	34	–	–	–	60	–	3	–	36	–
20	Everett	46,582	–	–	20	–	1	–	81	–	4	–	34	–
21	Haverhill	46,509	4	–	70	–	–	–	205	–	13	–	35	–
22	Fitchburg	41,965	1	–	15	–	1	–	18	–	1	–	22	–
23	Chicopee	41,382	–	–	62	–	–	–	69	–	2	–	18	–
24	Salem	40,947	1	–	108	–	–	–	127	–	10	–	18	–
25	Chelsea	40,692	1	–	25	–	4	–	131	–	9	–	21	–
26	Arlington	40,500	–	–	205	–	1	–	138	–	13	–	10	–
27	Waltham	40,115	–	–	44	–	4	–	63	–	1	–	24	–
28	Taunton	37,398	4	–	1	–	2	1	3	–	–	–	11	–
29	Watertown	35,490	1	–	117	–	2	–	144	–	6	–	18	–
30	Revere	34,247	–	–	2	–	1	–	34	–	–	–	32	1
31	Belmont	27,500	–	–	137	–	–	–	139	–	18	–	4	–
32	Melrose	25,603	3	–	96	–	–	–	72	–	21	–	5	–
33	Beverly	25,593	2	–	119	–	–	–	123	–	12	–	13	–
	Cities and Towns of 10,000–25,000	*729,853*	*29*	–	*1945*	*1*	*11*	–	*1959*	–	*546*	–	*302*	–
34	Northampton	24,845	–	–	71	–	–	–	48	–	96	–	7	–
35	Weymouth	24,240	–	–	17	–	–	–	86	–	1	–	10	–
36	Gloucester	24,028	–	–	10	–	1	–	76	–	–	–	8	–
37	Framingham	23,339	1	–	83	–	1	–	108	–	44	–	20	–
38	North Adams	22,285	–	–	23	–	–	–	50	–	2	–	2	–
39	Leominster	22,277	1	–	42	–	–	–	59	–	4	–	4	–
40	Attleboro	22,108	2	–	44	–	–	–	89	–	11	–	11	–
41	Methuen	21,980	5	–	121	–	–	–	46	–	3	–	6	–
42	Peabody	21,756	–	–	22	–	1	–	39	–	3	–	20	–
43	Gardner	20,306	–	–	30	1	–	–	42	–	1	–	9	–
44	Woburn	19,786	–	–	31	–	–	–	6	–	1	–	9	–
45	Milton	18,991	–	–	87	–	–	–	43	–	6	–	3	–
46	Westfield	18,670	–	–	10	–	–	–	47	–	1	–	8	–
47	West Springfield	17,191	1	–	75	–	1	–	20	–	5	–	6	–
48	Southbridge	17,145	–	–	27	–	–	–	10	–	1	–	2	–
49	Winthrop	16,758	–	–	36	–	–	–	82	–	4	–	9	–
50	Braintree	16,460	–	–	46	–	–	–	106	–	4	–	9	–
51	Wakefield	16,212	1	–	1	–	–	–	63	–	4	–	10	–
52	Greenfield	15,693	–	–	278	–	–	–	50	–	1	–	10	–
53	Wellesley	15,585	1	–	86	–	–	–	86	–	59	–	7	–
54	Dedham	15,554	1	–	6	–	–	–	11	–	2	–	2	–
55	Milford	15,468	–	–	2	–	–	–	45	–	–	–	7	–
56	Norwood	15,424	–	–	1	–	–	–	37	–	2	–	3	–
57	Winchester	15,376	–	–	32	–	–	–	58	–	11	–	6	–
58	Marlborough	15,100	–	–	4	–	–	–	1	–	1	–	2	–
59	Saugus	14,840	1	–	43	–	3	–	84	–	17	–	10	–
60	Danvers	14,330	2	–	2	–	–	–	13	–	3	–	4	–
61	Natick	13,883	2	–	27	–	1	–	82	–	101	–	3	–
62	Newburyport	13,771	–	–	168	–	2	–	31	–	2	–	8	–
63	Lexington	13,652	–	–	15	–	–	–	47	–	8	–	8	–

Lobar Pneumonia		Measles		Menin. Meningitis		Mumps		Ophthalmia Neonatorum		Scarlet Fever		Syphilis		Tuberculosis, Pulmonary		Tuberculosis, Other Forms		Typhoid Fever		Whooping Cough		Line No.
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	
3617	860	22338	4	98	25	10491	6	973	–	7141	13	4613	267	2987	1520	295	112	68	3	9790	40	1
890	220	6203	–	13	2	2571	1	532	–	1698	–	1600	64	1003	458	90	25	18	1	2271	10	2
177	42	1331	–	5	2	839	–	42	–	405	–	121	12	132	58	12	5	3	1	376	–	3
527	*112*	*2405*	*1*	*9*	*5*	*751*	–	*181*	–	*1248*	*2*	*799*	*50*	*482*	*291*	*57*	*22*	*10*	–	*1323*	*9*	
106	21	855	1	–	1	93	–	52	–	451	–	232	15	73	36	8	3	3	–	359	2	4
61	15	56	–	1	2	255	–	57	–	406	2	74	6	76	58	8	4	4	–	158	3	5
196	32	904	–	1	1	207	–	27	–	85	–	182	9	109	57	12	6	2	–	496	1	6
28	11	24	–	7	1	140	–	21	–	21	–	149	7	83	53	9	6	–	–	153	1	7
80	19	527	–	–	–	14	–	3	–	255	–	87	4	69	40	13	2	1	–	89	–	8
56	14	39	–	–	–	39	1	21	–	30	–	75	9	72	47	7	1	–	–	73	2	9
549	*140*	*3482*	*1*	*14*	*3*	*1765*	–	*133*	–	*1041*	*2*	*536*	*40*	*365*	*174*	*36*	*16*	*7*	–	*1564*	*5*	
98	35	75	–	2	–	503	–	16	–	158	2	98	10	70	42	5	1	–	–	215	–	10
26	21	95	–	–	–	8	–	1	–	10	–	79	4	56	20	9	2	–	–	70	2	11
112	14	520	–	4	1	366	–	1	–	139	–	64	6	55	21	5	3	–	–	270	–	12
65	17	687	–	–	–	229	–	2	–	75	–	59	2	20	17	2	4	2	–	283	–	13
60	11	334	–	1	–	34	–	3	–	90	–	47	2	41	15	6	3	2	–	140	1	14
49	9	761	1	7	2	424	–	106	–	344	–	50	1	22	11	4	–	1	–	258	–	15
40	12	683	–	–	–	25	–	2	–	91	–	61	5	37	19	3	1	–	–	178	–	16
62	11	107	–	–	–	48	–	1	–	109	–	34	6	35	19	1	1	1	–	42	2	17
37	10	220	–	–	–	128	–	1	–	25	–	44	4	29	10	1	1	1	–	108	–	18
495	*109*	*1852*	–	*7*	*6*	*1336*	–	*42*	–	*485*	*2*	*497*	*23*	*289*	*160*	*30*	*15*	*10*	–	*1044*	*2*	
7	7	8	–	–	–	21	–	2	–	16	1	30	2	18	9	1	1	–	–	30	–	19
41	11	81	–	1	–	41	–	2	–	75	–	47	3	21	16	4	1	–	–	47	–	20
56	9	23	–	–	–	160	–	–	–	69	–	66	3	15	11	1	1	2	–	145	–	21
43	12	12	–	2	3	23	–	1	–	13	–	26	–	30	15	1	–	1	–	52	–	22
17	2	65	–	2	1	28	–	–	–	58	1	25	2	31	13	4	1	2	–	16	–	23
53	13	39	–	–	–	140	–	–	–	19	–	30	2	16	11	1	1	–	–	98	1	24
27	10	216	–	–	–	94	–	2	–	17	–	44	4	26	14	4	1	2	–	14	1	25
34	7	515	–	–	–	92	–	2	–	38	–	26	1	17	10	2	1	2	–	164	–	26
79	6	186	–	1	1	89	–	1	–	42	–	30	2	25	6	1	–	–	–	28	–	27
7	7	–	–	1	–	–	–	–	–	10	–	52	1	24	24	4	2	–	–	1	–	28
20	5	128	–	–	–	127	–	–	–	29	–	32	1	20	11	2	4	–	–	94	–	29
3	8	37	–	–	1	6	–	–	–	11	–	41	1	19	10	2	1	–	–	13	–	30
19	–	331	–	–	–	362	–	27	–	10	–	13	–	5	3	1	1	–	–	201	–	31
31	5	169	–	–	–	122	–	3	–	63	–	14	–	9	5	–	–	–	–	44	–	32
58	7	42	–	–	–	31	–	2	–	15	–	21	1	13	2	2	–	1	–	97	–	33
483	*109*	*3627*	*1*	*20*	*3*	*1391*	*3*	*19*	–	*1124*	*4*	*449*	*36*	*338*	*189*	*41*	*13*	*10*	–	*1602*	*8*	
28	2	40	–	–	–	20	–	2	–	10	–	18	5	9	10	2	1	–	–	13	–	34
9	2	32	–	2	–	1	–	1	–	16	–	11	–	11	9	–	–	–	–	21	–	35
7	3	6	–	1	–	12	–	1	–	1	–	19	–	17	12	2	–	–	–	10	–	36
35	4	273	–	3	–	223	–	–	–	143	1	9	1	17	9	1	–	–	–	118	1	37
15	8	–	–	–	–	9	–	–	–	36	–	10	–	9	5	1	–	1	–	1	–	38
9	3	12	–	–	–	10	–	–	–	21	–	17	1	7	6	1	–	–	–	9	1	39
17	4	32	–	–	–	3	–	–	–	32	1	13	1	11	7	1	–	–	–	73	–	40
8	6	24	–	–	–	22	–	1	–	15	–	20	–	15	8	2	2	–	–	55	1	41
24	1	17	1	–	–	165	–	–	–	17	–	17	1	12	11	2	1	–	–	31	1	42
28	2	12	–	–	–	2	–	3	–	3	–	12	3	7	6	1	–	1	–	33	1	43
7	6	34	–	2	–	–	–	–	–	36	–	15	–	7	6	1	2	1	–	16	–	44
3	1	287	–	1	–	41	–	–	–	23	–	16	–	6	2	1	–	–	–	41	–	45
9	3	17	–	–	–	11	1	–	–	25	–	18	1	14	4	1	–	–	–	–	–	46
6	1	77	–	–	–	124	–	–	–	67	–	6	–	8	7	3	–	–	–	91	–	47
10	4	3	–	–	–	18	–	1	–	48	–	9	–	8	2	–	–	–	–	1	–	48
15	2	545	–	–	–	29	–	1	–	21	–	7	–	5	3	1	–	2	–	146	1	49
15	3	90	–	3	–	139	–	1	–	11	–	15	2	12	3	1	–	–	–	102	–	50
9	1	247	–	–	–	78	1	–	–	27	–	10	1	9	3	–	–	–	–	57	–	51
2	3	7	–	–	–	159	–	–	–	23	–	11	5	6	2	–	1	–	–	7	–	52
15	2	155	–	–	–	22	1	–	–	21	–	13	2	6	2	–	–	1	–	61	–	53
5	1	171	–	–	–	4	–	–	–	27	–	5	–	4	5	–	–	–	–	17	–	54
15	1	4	–	1	–	17	–	1	–	2	–	10	1	4	3	1	–	–	–	14	–	55
16	4	65	–	1	–	19	–	2	–	19	–	9	1	5	–	–	–	1	–	3	–	56
11	–	45	–	–	–	12	–	–	–	54	–	12	–	4	5	–	–	–	–	49	–	57
3	3	350	–	–	–	34	–	–	–	39	–	10	–	3	2	–	–	–	–	17	–	58
4	1	192	–	–	–	15	–	–	–	15	–	6	–	9	4	–	–	–	–	62	–	59
19	4	2	–	–	–	2	–	–	–	6	–	7	1	6	1	3	1	1	–	21	1	60
11	4	47	–	–	–	40	–	1	–	175	–	8	1	1	3	1	1	–	–	162	–	61
8	2	4	–	–	–	2	–	–	–	8	–	11	–	2	1	–	–	–	–	35	–	62
28	2	136	–	–	–	7	–	–	–	4	–	6	–	32	3	5	–	–	–	17	–	63

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1941	Anterior Poliomyelitis		Chicken Pox		Diphtheria		Dog Bite		German Measles		Gonorrhea	
			Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
64	Webster	13,209	–	–	15	–	1	–	1	–	58	–	7	–
65	Plymouth	13,106	–	–	35	–	–	–	21	–	1	–	11	–
66	Needham	12,643	–	–	35	–	–	–	63	–	7	–	4	–
67	Adams	12,598	1	–	20	–	–	–	12	–	1	–	5	–
68	Clinton	12,394	–	–	8	–	–	–	10	–	–	–	1	–
69	Andover	11,265	1	–	102	–	–	–	27	–	64	–	4	–
70	Athol	11,242	–	–	13	–	–	–	–	–	–	–	9	–
71	Marblehead	11,128	–	–	75	–	–	–	90	–	8	–	3	–
72	Reading	11,002	–	–	28	–	–	–	33	–	1	–	7	–
73	Fairhaven	10,937	1	–	–	–	–	–	–	–	–	–	5	–
74	Stoneham	10,852	1	–	54	–	–	–	60	–	3	–	5	–
75	Swampscott	10,812	–	–	77	–	–	–	36	–	3	–	–	–
76	Amesbury	10,734	–	–	31	–	–	–	41	–	1	–	10	–
77	North Attleborough	10,378	2	–	–	–	–	–	–	–	–	–	4	–
78	Northbridge	10,307	1	–	–	–	–	–	–	–	1	–	3	–
79	Easthampton	10,190	4	–	12	–	–	–	–	–	–	–	1	–
	Towns of 5,000–10,000	*339,232*	*16*	–	*804*	*1*	*6*	–	*502*	–	*161*	–	*169*	*1*
80	Palmer	9,097	–	–	2	–	1	–	–	–	1	–	5	–
81	Middleborough	9,084	1	–	8	–	–	–	5	–	6	–	1	–
82	Dartmouth	9,039	–	–	18	–	–	–	23	–	5	–	3	–
83	Bridgewater	8,884	–	–	19	–	–	–	21	–	37	–	5	–
84	Stoughton	8,684	–	–	10	–	1	–	18	–	2	–	6	–
85	Barnstable	8,465	1	–	5	–	–	–	27	–	5	–	15	–
86	Chelmsford	8,208	–	–	7	–	–	–	12	–	1	–	3	–
87	Billerica	8,189	1	–	6	–	–	–	19	–	–	–	1	–
88	Hingham	8,170	–	–	81	–	2	–	34	–	–	–	1	–
89	Rockland	8,157	–	–	–	–	–	–	4	–	–	–	1	–
90	Ludlow	8,095	–	–	45	–	–	–	1	–	2	–	6	–
91	Concord	8,033	–	–	72	–	–	–	9	–	2	–	1	–
92	Hudson	7,990	–	–	–	–	–	–	–	–	–	–	4	–
93	Agawam	7,934	–	–	5	–	–	–	–	–	2	–	7	–
94	Whitman	7,774	–	–	1	–	–	–	1	–	–	–	4	–
95	Randolph	7,769	–	–	–	–	–	–	–	–	–	–	4	–
96	Shrewsbury	7,669	–	–	6	–	–	–	–	–	2	–	–	–
97	North Andover	7,594	–	–	61	–	–	–	25	–	9	–	2	–
98	Ware	7,578	2	–	–	–	–	–	–	–	–	–	–	–
99	Montague	7,521	–	–	8	1	–	–	10	–	–	–	3	–
100	Grafton	7,509	–	–	1	–	–	–	2	–	–	–	2	–
101	Walpole	7,463	1	–	1	–	–	–	5	–	–	–	–	–
102	Dracut	7,391	–	–	1	–	–	–	12	–	–	–	1	–
103	Franklin	7,335	–	–	21	–	–	–	3	–	1	–	2	–
104	Falmouth	7,130	3	–	12	–	–	–	35	–	7	–	17	–
105	Millbury	6,985	–	–	5	–	–	–	28	–	14	–	–	–
106	South Hadley	6,866	–	–	11	–	–	–	21	–	3	–	1	–
107	Maynard	6,770	–	–	3	–	–	–	3	–	–	–	7	–
108	Auburn	6,689	–	–	77	–	1	–	1	–	3	–	2	–
109	Spencer	6,686	1	–	65	–	–	–	5	–	3	–	4	–
110	Winchendon	6,621	–	–	55	–	–	–	10	–	1	–	3	–
111	Mansfield	6,550	–	–	25	–	–	–	25	–	1	–	1	–
112	Amherst	6,475	–	–	29	–	–	–	19	–	17	–	2	–
113	Westborough	6,468	–	–	2	–	–	–	9	–	5	–	–	1
114	Canton	6,451	–	–	10	–	–	–	39	–	1	–	6	–
115	Wareham	6,447	4	–	3	–	–	–	–	–	–	–	25	–
116	Ipswich	6,440	–	–	1	–	–	–	–	–	14	–	2	–
117	Uxbridge	6,433	1	–	13	–	–	–	12	–	1	–	2	–
118	Foxborough	6,421	–	–	11	–	1	–	14	–	5	–	1	–
119	Tewksbury	6,344	–	–	17	–	–	–	7	–	1	–	2	–
120	Longmeadow	5,958	–	–	13	–	–	–	20	–	3	–	–	–
121	Somerset	5,931	–	–	7	–	–	–	–	–	–	–	3	–
122	Great Barrington	5,812	–	–	22	–	–	–	6	–	4	–	4	–
123	Abington	5,688	–	–	–	–	–	–	–	–	–	–	1	–
124	Monson	5,680	–	–	42	–	–	–	–	–	2	–	1	–
125	Orange	5,640	–	–	2	–	–	–	–	–	–	–	6	–
126	Easton	5,115	1	–	1	–	–	–	17	–	1	–	2	–
	Towns of 2,500–5,000	220,849	*15*	*3*	*461*	–	*5*	–	*349*	–	*121*	–	*85*	*2*
127	Seekonk	4,930	–	–	–	–	–	–	–	–	–	–	–	–
128	Leicester	4,901	–	–	–	–	–	–	–	–	–	–	–	–
129	Wrentham	4,809	–	–	7	–	2	–	7	–	–	–	–	–
130	Swansea	4,776	2	–	–	–	–	–	3	–	–	–	1	–
131	Wilmington	4,723	–	–	1	–	–	–	–	–	–	–	1	–
132	Oxford	4,706	–	–	19	–	–	–	16	–	5	–	2	–
133	Dudley	4,659	1	–	–	–	–	–	–	–	–	–	1	–
134	Templeton	4,656	–	–	–	–	–	–	1	–	–	–	1	–

Dangerous to the Public Health, 1941 — Continued.

Lobar Pneumonia		Measles		Menin. Meningitis		Mumps		Ophthalmia Neonatorium		Scarlet Fever		Syphilis		Tuberculosis, Pulmonary		Tuberculosis, Other Forms		Typhoid Fever		Whooping Cough		Line No.
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	
2	2	10	–	–	–	8	–	1	–	8	–	4	1	2	7	2	2	–	–	–	–	64
3	3	88	–	–	–	18	–	–	–	29	–	9	1	4	3	1	–	–	–	49	–	65
13	1	20	–	–	–	21	–	2	–	14	–	4	1	7	5	–	–	–	–	58	1	66
3	–	3	–	–	–	5	–	1	–	7	–	8	–	6	4	1	1	–	–	–	–	67
5	2	11	–	–	–	1	–	–	–	4	–	4	1	3	2	1	–	–	–	–	–	68
3	2	71	–	–	–	22	–	–	–	13	–	1	–	3	1	1	–	–	–	49	–	69
8	1	182	–	–	–	14	–	–	–	7	–	9	–	4	2	–	–	–	–	13	–	70
6	1	37	–	–	–	6	–	–	–	16	–	7	1	4	4	–	–	2	–	27	–	71
12	–	12	–	2	–	1	–	–	–	24	–	7	–	3	2	1	–	–	–	6	–	72
–	2	–	–	1	1	3	–	–	–	1	–	9	–	7	–	2	–	–	–	1	1	73
6	3	209	–	–	–	24	–	–	–	2	–	9	1	8	3	1	–	–	–	77	–	74
4	–	13	–	–	–	25	–	–	–	16	–	6	1	3	1	–	–	–	–	14	–	75
8	1	6	–	–	–	2	–	–	–	32	–	7	–	4	1	–	–	–	–	20	–	76
–	2	–	–	–	–	–	–	–	–	2	2	4	1	1	3	–	1	–	–	–	–	77
5	3	2	–	2	1	–	–	–	–	3	–	2	1	4	4	–	–	–	–	1	–	78
14	3	37	–	1	1	1	–	–	–	1	–	9	–	9	3	–	–	–	–	4	–	79
228	*63*	*1415*	*1*	*10*	*1*	*813*	*1*	*19*	–	*535*	*1*	*218*	–	*179*	*88*	*13*	*7*	*3*	–	*753*	*4*	
8	–	4	–	1	–	4	–	–	–	27	–	5	–	4	1	–	–	–	–	9	–	80
3	2	6	–	–	–	113	–	–	–	7	–	10	4	2	4	1	–	1	–	101	–	81
2	–	4	–	1	–	19	–	3	–	–	–	7	1	8	2	–	–	–	–	17	–	82
18	2	5	–	–	–	5	–	–	–	10	–	2	–	21	4	–	1	–	–	31	–	83
2	2	35	–	–	–	18	–	–	–	113	–	3	1	7	3	1	1	1	–	13	–	84
1	4	31	–	1	1	2	–	14	–	7	–	5	–	6	2	–	–	–	–	12	–	85
4	3	6	–	–	–	2	–	–	–	1	–	–	–	2	3	–	–	–	–	3	–	86
3	–	9	–	–	–	–	–	–	–	13	–	7	–	2	1	–	–	–	–	9	–	87
4	1	40	–	–	–	5	–	–	–	38	–	10	–	5	–	1	–	–	–	12	–	88
1	1	3	–	–	–	–	–	–	–	3	–	5	–	4	1	–	–	–	–	1	–	89
3	1	1	–	–	–	23	–	–	–	10	–	6	–	–	5	–	–	–	–	12	–	90
2	2	112	–	–	–	6	–	1	–	7	–	5	–	1	1	–	–	–	–	32	–	91
–	1	–	–	–	–	–	–	–	–	2	–	7	–	–	3	–	–	–	–	1	–	92
6	–	2	–	–	–	31	1	–	–	37	–	10	–	–	2	–	–	–	–	13	–	93
1	–	1	–	–	–	–	–	1	–	2	–	3	–	4	2	–	–	–	–	6	–	94
3	1	–	–	1	–	–	–	–	–	1	–	7	–	5	–	–	–	–	–	–	–	95
10	3	87	–	–	–	24	–	–	–	3	–	1	–	4	2	–	–	–	–	11	–	96
1	1	2	–	–	–	2	–	–	–	–	–	–	–	10	3	–	–	–	–	13	–	97
3	1	–	–	1	–	–	–	–	–	–	–	3	1	1	2	–	–	–	–	12	1	98
–	–	3	–	–	–	–	–	–	–	14	–	1	–	5	1	–	–	–	–	1	–	99
25	–	6	–	–	–	2	–	–	–	–	–	4	–	29	–	–	–	–	–	1	–	100
5	2	67	–	–	–	16	–	–	–	5	–	–	1	2	–	1	–	–	–	3	–	101
–	1	1	–	–	–	1	–	–	–	1	–	1	–	1	3	–	–	–	–	–	1	102
1	3	3	–	–	–	16	–	–	–	2	–	8	1	–	–	1	–	–	–	1	–	103
4	3	19	1	–	–	8	–	–	–	15	–	15	2	3	–	–	–	–	–	49	–	104
6	1	37	–	–	–	5	–	–	–	3	–	–	–	2	2	–	–	–	–	7	–	105
9	3	14	–	–	–	8	–	–	–	23	–	–	–	5	2	1	2	–	–	10	–	106
4	3	77	–	–	–	11	–	–	–	3	–	2	–	1	1	–	–	–	–	6	–	107
7	1	83	–	–	–	161	–	–	–	18	–	2	1	2	2	1	–	–	–	77	–	108
4	2	24	–	1	–	5	–	–	–	8	–	1	–	3	3	–	–	1	–	20	1	109
5	–	232	–	–	–	11	–	–	–	16	–	4	–	6	1	–	–	–	–	63	–	110
2	1	15	–	–	–	–	–	–	–	6	–	7	–	1	2	–	–	–	–	17	1	111
6	1	122	–	–	–	4	–	–	–	1	–	7	1	2	2	1	–	–	–	–	–	112
9	–	174	–	–	–	39	–	–	–	1	–	3	2	1	–	1	–	–	–	34	–	113
10	1	44	–	–	–	32	–	–	–	29	–	5	–	–	3	–	–	–	–	28	–	114
2	3	–	–	2	–	–	–	–	–	7	–	21	3	2	8	–	1	–	–	–	–	115
4	–	45	–	2	–	1	–	–	–	6	–	5	–	–	2	–	–	–	–	21	–	116
10	1	5	–	–	–	3	–	–	–	40	–	5	1	1	3	–	–	–	–	5	–	117
17	2	17	–	–	–	8	–	–	–	6	–	6	–	12	1	1	–	–	–	6	–	118
3	1	–	–	–	–	165	–	–	–	–	–	2	–	–	–	–	–	–	–	37	–	119
5	3	8	–	–	–	20	–	–	–	3	–	5	–	–	–	–	–	–	–	2	–	120
–	2	2	–	–	–	3	–	–	–	6	1	2	–	2	3	1	1	–	–	–	–	121
–	–	8	–	–	–	12	–	–	–	5	–	8	–	3	1	1	–	–	–	35	–	122
–	1	–	–	–	–	–	–	–	–	4	–	6	–	1	3	–	–	–	–	–	–	123
7	–	5	–	–	–	1	–	–	–	7	–	1	–	7	–	–	–	–	–	–	–	124
4	2	15	–	–	–	4	–	–	–	4	–	1	–	2	1	–	–	–	–	6	–	125
4	1	41	–	–	–	23	–	–	–	21	–	–	–	–	3	1	1	–	–	16	–	126
106	*35*	*1216*	–	*4*	*1*	*622*	–	*3*	–	*259*	*1*	*149*	*14*	*73*	*54*	*10*	*4*	*5*	–	*466*	*1*	
–	1	–	–	–	–	–	–	–	–	–	–	1	–	2	1	–	–	–	–	–	–	127
2	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	1	–	–	–	128
6	2	3	–	–	–	59	–	–	–	7	–	1	–	7	–	–	–	–	–	26	–	129
2	2	1	–	–	–	1	–	–	–	3	–	4	–	4	3	1	1	–	–	12	–	130
7	–	–	–	–	–	–	–	–	–	10	–	4	–	1	2	–	–	–	–	3	–	131
6	1	4	–	–	–	36	–	–	–	4	–	3	–	2	3	–	–	–	–	10	–	132
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4	1	–	–	–	–	–	133
4	1	–	–	–	–	–	–	–	–	–	–	1	–	–	1	–	–	–	–	–	–	134

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1941	Anterior Poliomyelitis		Chicken Pox		Diphtheria		Dog Bite		German Measles		Gonorrhea	
			Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
135	Blackstone	4,554	–	–	–	–	–	–	–	–	–	–	–	–
136	Medfield	4,422	–	–	1	–	–	–	–	–	–	–	1	–
137	Williamstown	4,342	1	–	15	–	–	–	–	–	21	–	–	–
138	Scituate	4,256	–	–	–	–	–	–	–	–	–	–	–	–
139	Lee	4,242	–	–	27	–	–	–	12	–	–	–	2	–
140	Dalton	4,205	–	–	–	–	–	–	–	–	–	–	1	–
141	Acushnet	4,151	3	2	–	–	–	–	–	–	–	–	2	–
142	Westport	4,101	–	–	83	–	–	–	9	–	1	–	1	–
143	Bedford	3,957	–	–	1	–	–	–	10	–	–	–	2	–
144	Holden	3,930	–	–	21	–	–	–	16	–	3	–	–	–
145	East Bridgewater	3,862	–	–	38	–	–	–	16	–	44	–	6	–
146	Westford	3,857	–	–	1	–	–	–	2	–	–	–	3	–
147	Sharon	3,784	1	–	–	–	–	–	31	–	2	–	–	–
148	Provincetown	3,652	1	–	3	–	–	–	8	–	–	–	4	–
149	Ayer	3,635	–	–	37	–	–	–	8	–	6	–	4	–
150	Weston	3,623	–	–	3	–	–	–	21	–	–	–	1	–
151	Wayland	3,575	–	–	6	–	–	–	15	–	2	–	2	–
152	Rockport	3,548	–	–	–	–	–	–	38	–	–	–	–	–
153	Belchertown	3,548	–	–	–	–	–	–	5	–	–	–	–	–
154	Westwood	3,534	1	1	13	–	–	–	3	–	2	–	5	–
155	Barre	3,529	–	–	–	–	–	–	–	–	–	–	2	–
156	Warren	3,503	–	–	11	–	–	–	18	–	3	–	3	–
157	East Longmeadow	3,411	–	–	2	–	–	–	4	–	2	–	2	–
158	Nantucket	3,368	–	–	1	–	–	–	8	–	–	–	1	–
159	Bourne	3,367	1	–	24	–	1	–	4	–	2	–	3	–
160	North Brookfield	3,340	1	–	1	–	–	–	4	–	1	–	1	–
161	Holbrook	3,328	–	–	3	–	–	–	18	–	–	–	2	–
162	Medway	3,314	–	–	–	–	–	–	2	–	–	–	2	–
163	West Bridgewater	3,252	1	–	6	–	–	–	6	–	1	–	1	–
164	Norton	3,152	–	–	3	–	–	–	5	–	6	–	1	–
165	Pepperell	3,137	–	–	–	–	–	–	–	–	–	–	1	–
166	Hopedale	3,129	–	–	–	–	–	–	–	–	–	–	–	–
167	Cohasset	3,113	–	–	1	–	–	–	6	–	–	–	2	–
168	Wilbraham	3,081	1	–	1	–	–	–	10	–	1	–	4	–
169	Holliston	3,016	–	–	2	–	–	–	3	–	4	–	1	1
170	North Reading	3,003	–	–	–	–	–	–	–	–	–	–	4	–
171	Lancaster	2,970	–	–	22	–	–	–	–	–	–	–	–	–
172	Dighton	2,963	–	–	–	–	–	–	–	–	–	–	–	–
173	Bellingham	2,953	–	–	–	–	–	–	–	–	–	–	1	–
174	Lenox	2,901	–	–	–	–	–	–	4	–	–	–	–	–
175	Hanover	2,882	–	–	2	–	–	–	8	–	1	–	–	–
176	Sutton	2,824	–	–	–	–	–	–	–	–	–	–	1	–
177	Kingston	2,796	–	–	–	–	–	–	–	–	–	–	–	–
178	Rehoboth	2,751	–	–	–	–	1	–	–	–	–	–	2	–
179	Acton	2,727	–	–	3	–	1	–	16	–	–	–	–	–
180	Hopkinton	2,713	–	–	3	–	–	–	4	–	2	–	–	–
181	Douglas	2,669	–	–	74	–	–	–	–	–	1	–	–	–
182	Deerfield	2,661	–	–	8	–	–	–	1	–	5	–	2	–
183	Shirley	2,630	–	–	9	–	–	–	3	–	–	–	1	–
184	Hanson	2,617	1	–	–	–	–	–	–	–	2	–	4	–
185	Charlton	2,607	–	–	–	–	–	–	–	–	–	–	3	–
186	Groton	2,563	–	–	10	–	–	–	4	–	4	–	–	–
187	Hadley	2,564	–	–	–	–	–	–	–	–	–	–	–	–
188	Harwich	2,560	–	–	–	–	–	–	–	–	–	–	1	–
189	Marshfield	2,517	–	–	–	–	–	–	–	–	–	–	1	–
	Towns of 1,000–2,500	*158,650*	*11*	–	*450*	–	*2*	–	*220*	–	*92*	–	*76*	*1*
190	Ashland	2,489	–	–	7	–	–	–	16	–	4	–	3	–
191	Manchester	2,452	1	–	8	–	–	–	1	–	–	–	–	–
192	Duxbury	2,441	–	–	–	–	–	–	–	–	–	–	2	–
193	Northborough	2,435	–	–	–	–	–	–	–	–	–	–	2	–
194	Middleton	2,426	–	–	–	–	–	–	–	–	–	–	–	–
195	Norfolk	2,401	1	–	1	–	1	–	5	–	–	–	–	–
196	Salisbury	2,398	–	–	88	–	–	–	21	–	–	–	8	–
197	Lynnfield	2,373	–	–	9	–	–	–	4	–	4	–	–	–
198	Yarmouth	2,347	–	–	2	–	–	–	10	–	2	–	1	–
199	Millis	2,345	–	–	1	–	–	–	–	–	–	–	2	–
200	Burlington	2,343	–	–	2	–	–	–	16	–	–	–	–	–
201	Avon	2,327	–	–	–	–	–	–	–	–	–	–	–	–
202	Merrimac	2,312	2	–	2	–	–	–	10	–	–	–	5	–
203	Sturbridge	2,283	–	–	9	–	–	–	–	–	–	–	–	–
204	Ashburnham	2,276	–	–	6	–	–	–	–	–	–	–	–	–
205	Upton	2,276	–	–	2	–	–	–	4	–	–	–	1	–
206	Southborough	2,238	2	–	14	–	–	–	1	–	5	–	–	–

Dangerous to the Public Health, 1941 — Continued

Lobar Pneumonia		Measles		Menin. Meningitis		Mumps		Ophthalmia Neonatorum		Scarlet Fever		Syphilis		Tuberculosis, Pulmonary		Tuberculosis, Other Forms		Typhoid Fever		Whooping Cough		Line No.
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	
1	1	–	–	–	–	–	–	–	–	1	–	–	–	–	1	1	–	–	–	–	–	135
–	–	69	–	–	–	2	–	–	–	–	–	2	–	7	1	–	–	–	–	16	–	136
1	–	21	–	–	–	1	–	–	–	4	–	6	2	2	1	–	–	–	–	3	–	137
–	1	1	–	–	–	–	–	–	–	–	–	6	–	2	2	1	–	1	–	–	–	138
–	1	–	–	–	–	96	–	–	–	7	–	3	–	1	1	–	–	–	–	–	–	139
–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	1	–	–	–	–	–	–	140
–	–	–	–	–	–	–	–	1	–	–	–	2	–	1	2	–	–	–	–	–	–	141
–	–	3	–	–	–	14	–	–	–	6	–	1	2	1	1	–	–	–	–	16	–	142
2	1	1	–	–	–	6	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	143
10	1	97	–	–	–	34	–	–	–	11	–	2	–	1	–	–	–	–	–	5	–	144
2	–	34	–	–	–	12	–	–	–	11	–	4	1	–	–	–	–	–	–	30	–	145
–	–	1	–	–	–	2	–	–	–	1	–	1	–	2	1	–	–	–	–	18	–	146
1	1	27	–	–	–	27	–	–	–	6	–	6	–	4	1	–	–	–	–	3	–	147
–	–	7	–	–	–	32	–	1	–	5	–	2	1	–	–	–	–	–	–	22	–	148
6	1	17	–	–	–	1	–	–	–	17	–	7	–	2	–	–	–	1	–	7	–	149
3	1	38	–	–	–	66	–	–	–	–	–	1	–	–	–	–	–	–	–	38	–	150
–	–	16	–	–	–	57	–	–	–	31	1	1	–	–	2	–	–	–	–	3	–	151
–	–	3	–	–	–	1	–	–	–	1	–	–	–	5	1	–	–	–	–	–	–	152
6	1	2	–	–	–	–	–	–	–	–	–	1	–	1	1	–	–	–	–	–	–	153
2	–	52	–	–	–	4	–	–	–	6	–	1	–	1	–	–	–	1	–	2	–	154
2	1	67	–	1	–	–	–	–	–	3	–	–	–	3	–	–	–	–	–	1	–	155
8	3	4	–	–	–	28	–	–	–	3	–	1	1	2	2	–	–	–	–	20	–	156
2	1	7	–	–	–	5	–	–	–	13	–	1	–	1	2	–	1	–	–	4	–	157
–	–	1	–	–	–	–	–	–	–	–	–	6	2	1	1	–	–	–	–	–	–	158
6	2	192	–	1	–	6	–	–	–	8	–	6	1	–	1	1	–	–	–	3	–	159
1	1	41	–	–	–	4	–	–	–	4	–	–	–	2	–	1	–	–	–	3	–	160
2	2	7	–	–	–	4	–	–	–	1	–	5	–	2	–	–	–	–	–	12	–	161
1	–	–	–	–	–	7	–	–	–	6	–	1	2	2	1	1	1	–	–	11	–	162
–	2	56	–	–	–	19	–	–	–	2	–	6	–	–	–	1	–	–	–	29	–	163
–	–	5	–	–	–	–	–	–	–	2	–	2	–	1	1	–	–	–	–	6	1	164
–	–	–	–	–	–	–	–	–	–	13	–	1	–	1	1	–	–	–	–	–	–	165
–	1	–	–	1	1	5	–	–	–	5	–	1	–	–	1	–	–	–	–	6	–	166
1	1	10	–	–	–	2	–	–	–	6	–	7	–	1	1	–	–	–	1	9	–	167
1	–	6	–	–	–	–	–	–	–	5	–	–	–	–	1	–	–	–	–	1	–	168
3	–	3	–	–	–	1	–	–	–	4	–	2	–	–	–	–	–	–	–	6	–	169
1	1	4	–	–	–	1	–	–	–	4	–	3	–	–	1	–	–	–	–	–	–	170
2	–	3	–	–	–	1	–	–	–	2	–	3	–	–	1	–	–	–	–	43	–	171
–	–	–	–	–	–	1	–	–	–	3	–	1	–	2	2	–	–	–	–	1	–	172
–	–	7	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	173
–	–	1	–	1	–	1	–	–	–	1	–	2	–	–	–	–	–	–	–	4	–	174
5	–	4	–	–	–	70	–	–	–	11	–	1	–	3	3	–	–	–	–	12	–	175
–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	176
–	1	–	–	–	–	3	–	–	–	6	–	2	–	–	–	–	–	–	–	3	–	177
–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	1	–	–	–	–	–	–	178
1	–	214	–	–	–	3	–	1	–	12	–	1	–	1	–	–	–	–	–	5	–	179
4	–	99	–	–	–	1	–	–	–	1	–	1	–	–	1	–	–	–	–	18	–	180
–	–	–	–	–	–	–	–	–	–	8	–	1	–	2	–	–	–	–	–	43	–	181
–	–	71	–	–	–	2	–	–	–	–	–	–	–	–	1	–	–	1	–	–	–	182
3	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	1	–	–	7	–	183
2	1	13	–	–	–	2	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	184
–	–	–	–	–	–	–	–	–	–	–	–	5	–	–	–	1	–	–	–	–	–	185
–	–	4	–	–	–	4	–	–	–	5	–	–	–	–	–	–	–	–	–	5	–	186
–	1	–	–	–	–	–	–	–	–	–	–	1	–	–	2	–	–	–	–	–	–	187
–	–	–	–	–	–	–	–	–	–	–	–	9	1	1	–	1	–	–	–	–	–	188
–	–	–	–	–	–	–	–	–	–	–	–	8	–	1	–	–	–	–	–	–	–	189
78	*30*	*552*	–	*6*	*2*	*347*	–	*1*	–	*216*	*1*	*123*	*9*	*64*	*40*	*5*	*5*	*2*	–	*378*	*1*	
1	–	38	–	–	–	5	–	–	–	28	–	–	–	–	–	–	–	–	–	76	–	190
–	–	–	–	1	–	17	–	–	–	–	–	–	–	1	1	–	–	–	–	3	–	191
–	–	–	–	–	–	2	–	–	–	–	–	7	–	–	–	–	–	–	–	1	1	192
3	1	–	–	–	–	–	–	–	–	2	–	1	–	1	–	–	–	–	–	–	–	193
–	–	–	–	–	–	1	–	–	–	–	–	2	–	–	2	–	–	–	–	–	–	194
6	–	2	–	–	–	1	–	–	–	4	–	–	–	17	1	–	–	–	–	–	–	195
4	–	1	–	–	–	–	–	–	–	2	–	6	–	–	–	–	–	–	–	1	–	196
–	–	4	–	–	–	39	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	197
1	1	4	–	1	–	–	–	–	–	2	1	2	–	–	1	–	–	–	–	2	–	198
1	–	1	–	–	–	2	–	–	–	1	–	–	–	1	–	–	–	–	–	1	–	199
–	–	2	–	–	–	–	–	–	–	35	–	3	–	3	1	–	–	–	–	2	–	200
–	–	–	–	–	–	–	–	–	–	–	–	3	1	–	1	–	–	–	–	–	–	201
1	–	–	–	–	–	1	–	–	–	1	–	4	–	2	2	–	–	–	–	1	–	202
1	–	3	–	–	–	2	–	–	–	6	–	–	–	–	–	–	–	–	–	–	–	203
6	1	1	–	–	–	3	–	–	–	5	–	2	–	1	1	–	–	–	–	–	–	204
–	1	45	–	–	–	19	–	–	–	–	–	2	–	–	–	–	–	–	–	6	–	205
1	–	72	–	–	–	5	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	206

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1941	Anterior Poliomyelitis		Chicken Pox		Diphtheria		Dog Bite		German Measles		Gonorrhea	
			Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
207	Lunenburg	2,228	–	–	5	–	–	–	1	–	1	–	–	–
208	Hatfield	2,185	–	–	7	–	–	–	4	–	–	–	2	–
209	Hull	2,182	–	–	1	–	–	–	8	–	10	–	5	–
210	Chatham	2,161	–	–	1	–	–	–	–	–	–	–	2	–
211	Westminster	2,151	–	–	–	–	–	–	–	–	–	–	–	–
212	Rutland	2,149	–	–	3	–	–	–	–	–	–	–	–	–
213	Raynham	2,141	–	–	–	–	–	–	–	–	–	–	–	–
214	Hardwick	2,117	1	–	1	–	–	–	4	–	8	–	1	–
215	Townsend	2,103	–	–	1	–	–	–	–	–	2	–	–	–
216	Groveland	2,096	–	–	2	–	–	–	3	–	6	–	–	–
217	Marion	2,078	–	–	4	–	–	–	5	–	1	–	11	–
218	Hamilton	2,037	–	–	–	–	–	–	–	–	–	–	2	–
219	Dennis	2,037	–	–	2	–	–	–	5	–	1	–	1	–
220	Tisbury	2,018	–	–	–	–	–	–	–	–	–	–	1	–
221	Northfield	1,985	–	–	6	–	–	–	4	–	8	–	–	–
222	Norwell	1,914	–	–	–	–	–	–	4	–	1	–	1	–
223	Harvard	1,890	–	–	29	–	–	–	4	–	–	–	–	–
224	Nahant	1,857	–	–	7	–	–	–	4	–	–	–	–	–
225	Sudbury	1,825	–	–	–	–	–	–	–	–	–	–	1	–
226	Stockbridge	1,821	–	–	1	–	–	–	4	–	2	–	2	–
227	Lincoln	1,818	–	–	–	–	–	–	–	–	–	–	–	–
228	Lakeville	1,805	1	–	–	–	–	–	2	–	–	–	–	–
229	Georgetown	1,798	–	–	59	–	–	–	20	–	–	–	–	–
230	West Boylston	1,786	–	–	3	–	–	–	–	–	–	–	–	–
231	Pembroke	1,745	–	–	–	–	–	–	–	–	–	–	–	–
232	Sterling	1,739	1	–	3	–	–	–	6	–	–	–	–	–
233	Sheffield	1,715	–	–	5	–	–	–	4	–	–	–	1	–
234	Cheshire	1,709	–	–	2	–	–	–	–	–	–	–	–	–
235	Littleton	1,676	–	–	1	–	–	–	–	–	–	–	–	–
236	Millville	1,675	–	–	–	–	–	–	–	–	–	–	–	–
237	Tingsborough	1,667	–	–	55	–	1	–	1	–	6	–	–	–
238	Williamsburg	1,659	–	–	–	–	–	–	1	–	–	–	–	–
239	Shelburne	1,647	–	–	16	–	–	–	3	–	3	–	–	–
240	Mattapoisett	1,620	–	–	–	–	–	–	–	–	–	–	–	–
241	Oak Bluffs	1,615	–	–	–	–	–	–	–	–	–	–	2	–
242	Newbury	1,606	–	–	–	–	–	–	–	–	–	–	–	–
243	Southwick	1,592	1	–	–	–	–	–	6	–	–	–	1	–
244	Freetown	1,576	–	–	–	–	–	–	–	–	–	–	1	1
245	Rowley	1,554	–	–	–	–	–	–	3	–	–	–	–	–
246	Buckland	1,530	–	–	–	–	–	–	–	–	–	–	–	–
247	West Newbury	1,512	–	–	–	–	–	–	1	–	–	–	1	–
248	Colrain	1,509	–	–	29	–	–	–	–	–	14	–	1	–
249	Orleans	1,484	–	–	–	–	–	–	7	–	1	–	1	–
250	Carver	1,479	1	–	–	–	–	–	2	–	–	–	–	–
251	Boylston	1,424	–	–	–	–	–	–	–	–	–	–	–	–
252	West Brookfield	1,403	–	–	1	–	–	–	7	–	1	–	3	–
253	Brookfield	1,398	–	–	11	–	–	–	3	–	1	–	1	–
254	Dover	1,395	–	–	3	–	–	–	–	–	1	–	2	–
255	Edgartown	1,381	–	–	–	–	–	–	–	–	–	–	–	–
256	Essex	1,374	–	–	–	–	–	–	1	–	–	–	–	–
257	Sandwich	1,352	–	–	–	–	–	–	–	–	–	–	–	–
258	Huntington	1,351	–	–	–	–	–	–	–	–	–	–	1	–
259	Mendon	1,340	–	–	–	–	–	–	–	–	–	–	–	–
260	Lanesborough	1,339	–	–	–	–	–	–	–	–	–	–	1	–
261	Erving	1,335	–	–	10	–	–	–	–	–	–	–	–	–
262	Clarksburg	1,319	–	–	–	–	–	–	–	–	–	–	–	–
263	Rochester	1,284	–	–	–	–	–	–	–	–	–	–	2	–
264	Plainville	1,267	–	–	–	–	–	–	–	–	–	–	–	–
265	Chester	1,262	–	–	–	–	–	–	1	–	–	–	–	–
266	Stow	1,255	–	–	–	–	–	–	1	–	–	–	–	–
267	Hinsdale	1,246	–	–	–	–	–	–	–	–	–	–	–	–
268	Russell	1,242	–	–	2	–	–	–	2	–	–	–	1	–
269	Wenham	1,232	–	–	4	–	–	–	4	–	1	–	2	–
270	Topsfield	1,170	–	–	–	–	–	–	1	–	7	–	–	–
271	Berkley	1,130	–	–	–	–	–	–	–	–	–	–	–	–
272	Granby	1,108	–	–	–	–	–	–	–	–	–	–	–	–
273	Sunderland	1,077	–	–	6	–	–	–	–	–	–	–	–	–
274	Hampden	1,064	–	–	–	–	–	–	–	–	–	–	–	–
275	Berlin	1,056	–	–	1	–	–	–	–	–	–	–	–	–
276	West Stockbridge	1,055	–	–	1	–	–	–	–	–	–	–	1	–
277	Ashby	1,031	–	–	16	–	–	–	–	–	–	–	–	–
278	Sherborn	1,030	–	–	–	–	–	–	1	–	–	–	–	–
279	East Brookfield	1,027	–	–	1	–	–	–	5	–	1	–	–	–
280	Brimfield	1,027	–	–	–	–	–	–	–	–	1	–	1	–
281	Hubbardston	1,023	–	–	–	–	–	–	–	–	–	–	–	–

Dangerous to the Public Health, 1941 — Continued

Lobar Pneumonia		Measles		Menin. Meningitis		Mumps		Ophthalmia Neonatorum		Scarlet Fever		Syphilis		Tuberculosis, Pulmonary		Tuberculosis, Other Forms		Typhoid Fever		Whooping Cough		Line No.
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	
3	1	–	–	–	–	1	–	–	–	3	–	3	–	1	1	–	–	–	–	–	–	207
4	–	–	–	–	–	14	–	–	–	–	–	4	–	1	–	–	–	–	–	2	–	208
3	–	40	–	–	–	4	–	–	–	13	–	4	–	1	1	–	–	–	–	15	–	209
–	1	3	–	1	–	–	–	–	–	9	–	1	–	1	1	–	–	–	–	–	–	210
1	–	–	–	–	1	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–	211
–	1	36	–	–	–	–	–	–	–	3	–	2	–	2	9	–	–	–	–	7	–	212
–	–	–	–	–	–	–	–	–	–	7	–	–	–	–	–	–	–	–	–	–	–	213
–	–	34	–	1	1	13	–	–	–	–	–	1	–	2	–	–	–	–	–	6	–	214
2	–	2	–	–	–	37	–	–	–	4	–	2	–	–	–	–	–	–	–	1	–	215
1	–	14	–	–	–	35	–	–	–	2	–	1	–	2	–	–	–	–	–	16	–	216
3	–	–	–	–	–	11	–	1	–	2	–	–	–	1	–	1	1	–	–	26	–	217
5	2	–	–	–	–	–	–	–	–	–	–	5	–	1	–	–	–	–	–	–	–	218
–	2	63	–	–	–	1	–	–	–	5	–	3	1	–	1	1	–	1	–	–	–	219
–	–	–	–	–	–	–	–	–	–	–	–	4	–	1	1	1	1	–	–	–	–	220
–	–	13	–	–	–	2	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	221
–	1	–	–	–	–	1	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	222
–	–	2	–	–	–	–	–	–	–	1	–	2	–	–	–	–	–	–	–	–	–	223
1	–	–	–	–	–	–	–	–	–	1	–	–	1	–	1	–	–	–	–	2	–	224
–	1	2	–	–	–	–	–	–	–	4	–	–	–	–	–	–	–	–	–	–	–	225
–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	2	–	–	–	–	–	–	226
–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	1	–	–	–	–	–	–	227
1	–	1	–	–	–	–	–	–	–	–	–	–	–	5	–	–	–	–	–	41	–	228
2	1	2	–	–	–	4	–	–	–	4	–	–	–	–	–	–	–	–	–	36	–	229
–	–	7	–	–	–	9	–	–	–	–	–	–	1	2	2	1	1	–	–	1	–	230
1	2	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	231
–	–	4	–	–	–	1	–	–	–	7	–	2	–	–	–	–	–	–	–	–	–	232
4	1	33	–	–	–	6	–	–	–	14	–	1	–	2	–	–	–	–	–	14	–	233
–	–	4	–	–	–	–	–	–	–	–	–	1	1	1	–	–	–	–	–	–	–	234
–	–	2	–	–	–	–	–	–	–	5	–	–	–	–	–	–	–	–	–	27	–	235
–	1	–	–	–	–	–	–	–	–	1	–	–	1	–	1	–	–	–	–	6	–	236
–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	3	–	237
2	–	43	–	–	–	1	–	–	–	–	–	–	–	1	1	–	–	–	–	2	–	238
–	–	2	–	–	–	1	–	–	–	1	–	–	–	1	–	–	1	–	–	–	–	239
–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	240
–	–	–	–	–	–	–	–	–	–	–	–	5	–	–	–	–	1	–	–	–	–	241
–	–	1	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	242
3	1	1	–	–	–	6	–	–	–	–	–	3	1	1	–	–	–	–	–	2	–	243
–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	244
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	245
–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	246
–	–	1	–	–	–	1	–	–	–	2	–	–	–	–	1	–	–	–	–	–	–	247
–	–	–	–	–	–	1	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	248
–	–	21	–	–	–	1	–	–	–	2	–	–	–	1	1	–	–	–	–	3	–	249
–	–	4	–	–	–	–	–	–	–	4	–	7	–	–	1	–	–	1	–	2	–	250
–	–	–	–	–	–	–	–	–	–	–	–	2	1	–	1	–	–	–	–	–	–	251
–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	8	–	252
1	–	3	–	–	–	74	–	–	–	1	–	1	–	–	–	–	–	–	–	15	–	253
1	–	8	–	–	–	5	–	–	–	5	–	2	–	–	–	–	–	–	–	8	–	254
–	–	–	–	–	–	–	–	–	–	–	–	3	–	1	–	–	–	–	–	–	–	255
2	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	256
3	1	–	–	–	–	–	–	–	–	–	–	4	–	1	1	–	–	–	–	2	–	257
1	–	1	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–	258
–	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	259
–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	260
–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	261
–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	262
–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	263
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	264
3	–	1	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–	2	–	265
–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4	–	266
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	267
–	1	–	–	–	–	–	–	–	–	1	–	5	–	–	–	–	–	–	–	–	–	268
–	–	1	–	–	–	13	–	–	–	1	–	–	–	–	–	1	–	–	–	4	–	269
2	–	1	–	–	–	–	–	–	–	8	–	1	–	–	–	–	–	–	–	1	–	270
–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	271
–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	1	–	–	–	–	–	–	272
–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	273
–	–	–	–	–	–	1	–	–	–	2	–	1	–	–	–	–	–	–	–	–	–	274
1	–	21	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	12	–	275
1	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	13	–	276
–	2	–	–	–	–	2	–	–	–	5	–	1	–	–	–	–	–	–	–	2	–	277
2	2	–	–	–	–	–	–	–	–	3	–	1	–	–	–	–	–	–	–	–	–	278
–	–	3	–	–	–	1	–	–	–	–	–	2	–	1	–	–	–	–	–	–	–	279
–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	280
–	–	–	–	1	–	–	–	–	–	–	–	1	–	1	1	–	–	–	–	–	–	281

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1941	Anterior Poliomyelitis		Chicken Pox		Diphtheria		Dog Bite		German Measles		Gonorrhea	
			Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
	Towns under 1,000	*34,559*	–	–	*57*	–	–	–	*33*	–	*18*	–	*13*	–
282	New Marlborough	967	–	–	3	–	–	–	1	–	–	–	–	–
283	Whately	961	–	–	1	–	–	–	–	–	–	–	–	–
284	Bernardston	961	–	–	5	–	–	–	1	–	–	–	–	–
285	Petersham	955	–	–	1	–	–	–	–	–	–	–	–	–
286	Southampton	951	–	–	–	–	–	–	2	–	–	–	1	–
287	Conway	949	–	–	2	–	–	–	–	–	–	–	–	–
288	Gill	925	–	–	3	–	–	–	–	–	9	–	–	–
289	Wellfleet	897	–	–	–	–	–	–	3	–	–	–	1	–
290	Halifax	883	–	–	–	–	–	–	1	–	–	–	–	–
291	Ashfield	873	–	–	4	–	–	–	–	–	–	–	–	–
292	Brewster	833	–	–	–	–	–	–	1	–	–	–	–	–
293	Paxton	804	–	–	–	–	–	–	–	–	–	–	–	–
294	Royalston	801	–	–	–	–	–	–	–	–	–	–	–	–
295	Boxford	793	–	–	11	–	–	–	8	–	5	–	–	–
296	Charlemont	787	–	–	–	–	–	–	–	–	–	–	4	–
297	Bolton	776	–	–	2	–	–	–	–	–	–	–	–	–
298	Carlisle	768	–	–	–	–	–	–	–	–	–	–	1	–
299	Princeton	713	–	–	–	–	–	–	–	–	–	–	–	–
300	Becket	690	–	–	–	–	–	–	–	–	–	–	–	–
301	Leverett	689	–	–	1	–	–	–	–	–	–	–	–	–
302	Granville	668	–	–	–	–	–	–	–	–	–	–	–	–
303	Richmond	629	–	–	–	–	–	–	–	–	–	–	2	–
304	Cummington	616	–	–	–	–	–	–	1	–	–	–	–	–
305	Truro	593	–	–	11	–	–	–	–	–	2	–	–	–
306	Eastham	585	–	–	–	–	–	–	1	–	–	–	–	–
307	Pelham	581	–	–	–	–	–	–	–	–	–	–	–	–
308	Plympton	534	–	–	–	–	–	–	–	–	–	–	1	–
309	Phillipston	496	–	–	–	–	–	–	–	–	–	–	–	–
310	Blandford	472	–	–	–	–	–	–	–	–	–	–	–	–
311	Worthington	470	–	–	–	–	–	–	–	–	–	–	–	–
312	Egremont	458	–	–	7	–	–	–	1	–	–	–	1	–
313	Dunstable	454	–	–	1	–	–	–	–	–	1	–	–	–
314	Warwick	452	–	–	–	–	–	–	–	–	–	–	–	–
315	Mashpee	445	–	–	–	–	–	–	–	–	–	–	1	–
316	New Braintree	442	–	–	–	–	–	–	–	–	–	–	1	–
317	Florida	434	–	–	–	–	–	–	–	–	–	–	–	–
318	Chesterfield	422	–	–	–	–	–	–	2	–	–	–	–	–
319	Sandisfield	421	–	–	1	–	–	–	–	–	–	–	–	–
320	Oakham	415	–	–	–	–	–	–	–	–	–	–	–	–
321	Westhampton	405	–	–	–	–	–	–	–	–	–	–	–	–
322	Wendell	394	–	–	–	–	–	–	–	–	–	–	–	–
323	Boxborough	383	–	–	–	–	–	–	2	–	–	–	–	–
324	Wales	367	–	–	–	–	–	–	–	–	–	–	–	–
325	Otis	364	–	–	1	–	–	–	8	–	–	–	–	–
326	Heath	361	–	–	–	–	–	–	–	–	–	–	–	–
327	New Salem	351	–	–	–	–	–	–	–	–	–	–	–	–
328	Hancock	330	–	–	–	–	–	–	–	–	–	–	–	–
329	Monterey	320	–	–	–	–	–	–	1	–	–	–	–	–
330	Windsor	307	–	–	–	–	–	–	–	–	–	–	–	–
331	Savoy	300	–	–	–	–	–	–	–	–	–	–	–	–
332	Washington	272	–	–	–	–	–	–	–	–	–	–	–	–
333	Leyden	260	–	–	–	–	–	–	–	–	–	–	–	–
334	West Tisbury	260	–	–	–	–	–	–	–	–	–	–	–	–
335	Plainfield	259	–	–	–	–	–	–	–	–	–	–	–	–
336	Holland	259	–	–	–	–	–	–	–	–	–	–	–	–
337	Hawley	251	–	–	–	–	–	–	–	–	–	–	–	–
338	Goshen	236	–	–	–	–	–	–	–	–	–	–	–	–
339	Rowe	226	–	–	–	–	–	–	–	–	–	–	–	–
340	Chilmark	224	–	–	–	–	–	–	–	–	1	–	–	–
341	Tyringham	210	–	–	–	–	–	–	–	–	–	–	–	–
342	Monroe	206	–	–	–	–	–	–	–	–	–	–	–	–
343	Alford	201	–	–	–	–	–	–	–	–	–	–	–	–
344	Middlefield	201	–	–	–	–	–	–	–	–	–	–	–	–
345	Shutesbury	188	–	–	–	–	–	–	–	–	–	–	–	–
346	Montgomery	181	–	–	3	–	–	–	–	–	–	–	–	–
347	Peru	145	–	–	–	–	–	–	–	–	–	–	–	–
348	Gosnold	137	–	–	–	–	–	–	–	–	–	–	–	–
349	Tolland	129	–	–	–	–	–	–	–	–	–	–	–	–
350	Gay Head	124	–	–	–	–	–	–	–	–	–	–	–	–
351	New Ashford	88	–	–	–	–	–	–	–	–	–	–	–	–
352	Mt. Washington	57	–	–	–	–	–	–	–	–	–	–	–	–
353	Tewksbury State Hospital		–	–	39	–	–	–	–	–	–	–	–	–

Dangerous to the Public Health, 1941 — Continued

Lobar Pneumonia		Measles		Menin. Meningitis		Mumps		Ophthalmia Neonatorium		Scarlet Fever		Syphilis		Tuberculosis, Pulmonary		Tuberculosis, Other Forms		Typhoid Fever		Whooping Cough		
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Line No.
8	–	87	–	–	–	23	–	–	–	36	–	24	–	6	8	1	–	–	–	7	–	
–	–	3	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	282
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	283
–	–	8	–	–	–	–	–	–	–	3	–	–	–	1	–	–	–	–	–	–	–	284
1	–	1	–	–	–	1	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	285
1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	286
–	–	–	–	–	–	1	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	287
–	–	–	–	–	–	1	–	–	–	9	–	2	–	1	–	–	–	–	–	1	–	288
–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	289
2	–	2	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	290
–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	291
–	–	4	–	–	–	–	–	–	–	1	–	2	–	–	–	–	–	–	–	–	–	292
–	2	2	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	293
–	–	–	–	–	–	–	–	–	–	3	–	3	–	1	–	–	–	–	–	–	–	294
–	–	–	–	–	–	1	–	–	–	4	–	1	–	–	–	–	–	–	–	–	–	295
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	296
–	–	–	–	–	–	2	–	–	–	1	–	–	–	–	1	–	–	–	–	–	–	297
1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	298
–	–	9	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	299
–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	2	–	300
–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	301
–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	302
–	–	2	–	–	–	1	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–	303
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	304
–	–	2	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	305
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	306
–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	2	–	–	–	–	–	–	307
–	–	2	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	308
–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	309
–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	310
–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	311
–	–	2	–	–	–	1	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	312
–	–	3	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–	313
1	–	8	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	314
–	1	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	315
–	–	4	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	316
–	–	1	–	–	–	2	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	317
–	–	32	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	318
1	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–	319
–	–	–	–	–	–	10	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–	320
–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	321
–	–	2	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	322
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	323
–	–	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	324
–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–	325
–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	326
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	327
–	–	2	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	328
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	329
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	330
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	331
1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	332
–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–	333
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	334
–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	335
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	336
–	1	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	337
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	338
–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–	339
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	340
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	341
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	342
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	343
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	344
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	345
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	346
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	347
–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	348
–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	349
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	350
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	351
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	352
25	–	–	–	–	–	–	–	1	–	–	–	–	–	56	–	1	–	–	–	–	–	353

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1941	Anterior Poliomyelitis		Chicken Pox		Diphtheria		Dog Bite		German Measles		Gonorrhea	
			Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
354	Camp Edwards		–	–	–	–	–	–	1	–	227	–	116	–
355	Fort Banks		–	–	1	–	–	–	–	–	12	–	64	–
356	Fort Devens		1	–	3	–	–	–	–	–	89	–	392	–
357	Fort Rodman		–	–	–	–	–	–	–	–	–	–	3	–
358	Gallups Island		–	–	–	–	–	–	–	–	–	–	1	–
359	Navy Yard		1	–	–	–	–	–	–	–	1	–	16	–
360	U. S. Marine Hospital, Boston		–	–	–	–	–	–	–	–	–	–	24	–
361	U. S. Marine Hospital, Tisbury		–	–	–	–	–	–	–	–	–	–	1	–
362	U. S. Naval Hospital, Chelsa		–	–	–	–	–	–	–	–	–	–	65	–
363	Westover Field		–	–	–	–	–	–	–	–	8	–	24	–

Dangerous to the Public Health, 1941 — Concluded.

Lobar Pneumonia		Measles		Menin. Meningitis		Mumps		Ophthalmia Neonatorum		Scarlet Fever		Syphilis		Tuberculosis, Pulmonary		Tuberculosis, Other Forms		Typhoid Fever		Whooping Cough		
Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Line No.
51	–	27	–	8	–	12	–	–	–	7	–	11	–	–	–	–	–	–	–	–	–	354
–	–	6	–	–	–	–	–	–	–	16	–	4	–	–	–	–	–	–	–	1	–	355
–	–	131	–	2	–	15	–	–	–	71	–	46	–	–	–	–	–	–	–	–	–	356
–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	357
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	358
–	–	1	–	–	–	2	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	359
–	–	–	–	–	–	–	–	–	–	–	–	18	–	–	–	–	–	–	–	–	–	360
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	361
–	–	–	–	–	–	–	–	–	–	–	–	13	–	–	–	–	–	–	–	–	–	362
–	–	3	–	–	–	4	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–	363

In addition to the above, there occurred 4 cases of **actinomycosis** with 2 deaths:

	Cases	Deaths
Boston	1	–
Chicopee	1	–
Malden	1	–
Reading	1	1
Southbridge	–	1

7 cases of **anthrax** with 1 death:

Holyoke	1	–
Lynn	1	–
Malden	1	–
Peabody	2	–
Springfield	1	–
West Boylston	1	1

4 cases of **amebic dysentery:**

Boston	2	–
Fitchburg	1	–
Worcester	1	–

303 cases of **bacillary dysentery** with 6 deaths:

Adams	1	–
Arlington	2	–
Ayer	16	–
Belmont	4	–
Boston	10	–
Brockton	1	1
Cambridge	2	–
Danvers	19	1
Dracut	2	–
Dunstable	91	–
Easthampton	3	–
Fairhaven	1	–
Fall River	3	–
Framingham	1	–
Holliston	4	–
Ipswich	10	–
Lawrence	1	1
Lowell	9	–
Lynn	13	–
Medford	1	–
Melrose	9	–
Northampton	2	–
Peabody	1	–
Revere	–	1
Russell	1	–
Salem	1	–
Seekonk	–	1
Southborough	1	–
Springfield	1	–
Stoneham	1	–
Waltham	18	–
Watertown	2	–
Winchester	1	–
Worcester	70	1
Wrentham	1	–

21 cases of **encephalitis infectious,** with 13 deaths:

Agawam	1	–
Attleboro	1	–
Beverly	–	1
Cambridge	1	–
Danvers	1	–
Dedham	1	–
Fall River	2	1
Gardner	–	1
Greenfield	–	1
Hadley	–	1
Haverhill	–	1
Holyoke	–	1
Lawrence	–	1
Lowell	1	–
Lynn	1	–
Malden	–	1
Middleborough	1	–
Milton	–	1
New Bedford	1	1
Scituate	1	1
Springfield	2	–
Sterling	1	–
Taunton	1	–
Waltham	1	–
Watertown	1	–
Westford	1	1
Winthrop	1	–
Worcester	1	–

10 cases of **malaria** with 1 death:

Boston	1	1
Fort Banks	1	–
Foxboro	6[1]	–
Haverhill	1	–
Winthrop	1	–

[1]Therapeutic.

14 cases of **meningitis, Pfeiffer bacillus** with 21 deaths:

	Cases	Deaths
Arlington	1	–
Attleboro	1	–
Boston	–	4
Brockton	1	–
Chicopee	1	1
Dedham	–	1
Everett	–	1
Fitchburg	–	1
Framingham	1	1
Gloucester	–	1
Lancaster	1	–
Maynard	–	1
Methuen	–	1
Newbury	1	–
Northampton	1	–
Orange	–	1
Palmer	1	–
Revere	–	1
Salem	2	1
Scituate	–	1
Springfield	1	1
Waltham	1	–
Weymouth	–	1
Wilmington	–	1
Woburn	–	1
Worcester	1	1

17 cases of **meningitis, pneumococcal:**

Arlington	1	–
Boston	1	–
Braintree	1	–
Brockton	1	–
Cambridge	1	–
Fort Devens	1	–
Gloucester	3	–
Haverhill	2	–
Lawrence	1	–
Lowell	1	–
Norwell	1	–
Quincy	1	–
Weymouth	1	–
Worcester	1	–

5 cases of **meningitis,** other forms:

Boston	1	–
Chicopee	1	–
East Bridgewater	1	–
Taunton	1	–
Winthrop	1	–

77 cases of **paratyphoid fever** and all other **Salmonella** infections with 1 death:

Adams	2	–
Belmont	1	–
Beverly	3	–
Boston	7	1
Brookline	1	–
Cambridge	3	–
Charlton	1	–
Chelmsford	1	–
Everett	1	–
Fort Banks	1	–
Fort Devens	1	–
Foxborough	1	–
Haverhill	2	–
Ipswich	1	–
Lawrence	1	–
Lexington	10	–
Lowell	2	–
Lynn	2	–
Malden	14	–
Marblehead	1	–
Medford	3	–
Northampton	1	–
Norwood	1	–
Peabody	2	–
Salem	6	–
Saugus	1	–
Tewksbury State Hospital	1	–
Waltham	1	–
Westwood	2	–
Winchester	1	–
Worcester	2	–

18 cases of **pellagra** with 7 deaths:

Adams	–	1
Boston	10	1
Fall River	1	–
Grafton	3	–
Newton	–	1
North Adams	–	1
Peabody	1	–
Quincy	1	–
Wakefield	1	1

	Cases	Deaths
West Brookfield	–	1
Winchendon	1	1
171 cases of septic sore throat with 22 deaths:		
Amesbury	3	–
Andover	3	–
Arlington	1	–
Ashland	1	–
Bernardston	3	–
Beverly	9	1
Boston	61	4
Boxford	1	–
Brockton	2	–
Cambridge	4	–
Chelsea	1	–
Chicopee	1	2
Concord	2	–
Easton	1	–
Everett	1	–
Fall River	20	1
Fort Banks	1	–
Fitchburg	–	1
Framingham	1	–
Gill	1	–
Greenfield	2	1
Hanson	2	–
Hingham	1	–
Holyoke	1	–
Ipswich	–	1
Lexington	1	–
Lowell	1	–
Lynn	4	–
Malden	2	1
Marlborough	–	2
Medford	8	–
Merrimac	4	–
Milford	–	1
Millbury	1	–
Milton	2	–
Monson	1	–
New Braintree	1	–
Newton	2	2
Norfolk	1	–
Oxford	2	–
Peabody	1	–
Plymouth	1	–
Revere	2	–
Salisbury	1	1
Scituate	1	–
Somerville	1	2
Springfield	1	1
Waltham	3	–
West Springfield	1	–
Weymouth	1	–
Williamstown	2	–
Winchester	1	–
Worcester	1	–
Wrentham	1	–
Yarmouth	–	1
19 cases of tetanus with 5 deaths:		
Attleboro	1	1
Boston	2	1
Brockton	1	–
Cambridge	1	–
Concord	1	–
Dudley	1	–
Hingham	1	–
Lowell	–	1
Methuen	1	–
Middleborough	1	1
New Bedford	2	1
Quincy	2	–
Saugus	1	–
Swampscott	1	–
Wakefield	1	–
Woburn	1	–
Worcester	1	–
24 cases of trachoma:		
Arlington	1	–
Boston	7	–
Burlington	1	–
Cambridge	1	–
Dedham	1	–
Everett	1	–
Fall River	1	–
Haverhill	1	–
Lynn	2	–
Milford	1	–
Natick	1	–
New Bedford	2	–
Peabody	1	–
Springfield	1	–
Worcester	2	–

50 cases of trichinosis:

	Cases	Deaths
Attleboro	6	–
Boston	10	–
Camp Edwards	17	–
Chelsea	2	–
Everett	1	–
Fall River	1	–
Framingham	4	–
Gloucester	1	–
Lawrence	1	–
Medford	2	–
Middleborough	1	–
Southbridge	2	–
Wakefield	1	–
Worcester	1	–
184 cases of tuberculosis, hilum:		
Boston	160	–
Brookline	1	–
Cambridge	1	–
Framingham	1	–
Haverhill	2	–
Lawrence	2	–
Lexington	1	–
Lowell	2	–
Malden	2	–
New Bedford	2	–
Quincy	3	–
Salem	1	–
Springfield	1	–
Wakefield	2	–
Watertown	1	–
Westfield	2	–
1 case of tularemia:		
Lawrence	1	–
2 cases of typhus fever:		
Chelmsford	1	–
Northampton	1	–
86 cases of undulant fever with 2 deaths:		
Acton	1	–
Adams	2	–
Amherst	1	–
Arlington	1	–
Athol	1	–
Boston	2	1
Bridgewater	1	–
Brockton	2	–
Brookfield	1	–
Carver	1	–
Deerfield	1	–
Falmouth	1	1
Franklin	1	–
Gloucester	2	–
Great Barrington	2	–
Haverhill	1	–
Hopkinton	1	–
Hudson	1	–
Leominster	16	–
Littleton	1	–
Lowell	2	–
Medford	1	–
Milford	1	–
Montague	2	–
Newburyport	1	–
Newton	1	–
Norfolk	1	–
North Adams	2	–
North Brookfield	1	–
Northampton	1	–
Northbridge	1	–
Orange	1	–
Palmer	1	–
Pittsfield	2	–
Plymouth	1	–
Reading	1	–
Royalston	1	–
Sheffield	1	–
Shelburne	2	–
Somerset	1	–
Somerville	1	–
Stockbridge	1	–
Templeton	1	–
Uxbridge	1	–
Walpole	1	–
Warren	1	–
Wayland	1	–
Webster	2	–
Wellesley	1	–
West Brookfield	2	–
Westborough	1	–
Westford	2	–
Whitman	1	–
Worcester	5	–

THE DIVISION OF FOOD AND DRUGS

HERMANN C. LYTHGOE, *Director*

The Food and Drug Division during the year 1941 has been engaged in the usual routine work relative to the enforcement of the laws pertaining to the sale of milk, foods and drugs; the slaughtering laws; the cold storage laws: the bakery laws; the frozen dessert laws; the laws pertaining to the pasteurization of milk; the laws pertaining to the bottling of carbonated nonalcoholic beverages; certain phases of the narcotic law; the law pertaining to the sale of wood alcohol; the laws pertaining to the sale of articles of bedding and upholstered furniture; and examination of liquors, chemicals, etc. for Police Departments.

There has been a reduction in the number of samples of improperly pasteurized milk and a great increase in the number of samples of pasteurized milk with high bacteria counts. This has been traced largely to the substitution of dirty milking machines for cream and milk because of the difficulty in securing help.

There has been a great increase in the sale of decomposed meats, particularly hamburg steak, sausage, and sausage meat. Violations pertaining to the sale of adulterated olive oil, while many, show a reduction over recent years. Violations of the sanitary food law show an increase due to difficulty in securing help. There has also been an increase in violations of the law pertaining to articles of bedding and upholstered furniture. The actual number of prosecutions was slightly less than in 1940.

TABLE 1.— *Prosecutions for Violations of the Food and Drug Laws*
For Sale of Milk not of Good Standard Quality

NAME	ADDRESS	COURT	DATE	RESULT
Clover Luck Dairy, Inc.	Newton	Newton	Oct. 9, 1941	Conviction [1]
Green Parrott, Inc.	North Cambridge	Cambridge	Aug. 22, 1941	Conviction
For Sale of Milk from Which a Portion of the Cream Had Been Removed				
Fenway Farms Dairy, Inc.	East Longmeadow	Springfield	May 9, 1941	Conviction
Smith, William Henry	Great Barrington	Great Barrington	June 7, 1941	Conviction
For Sale of Milk Containing Added Water				
Clark, Joseph W.	West Brookfield	Brookfield	Mar. 14, 1941	Conviction
Cronin, William	Methuen	Methuen.	Oct. 10, 1941	Conviction [2]
Hagopian, Kapreal	Marlborough	Marlborough	Jan. 17, 1941	Conviction
Hood & Sons, H. P., Inc.	Newburyport	Newburyport	Jan. 27, 1941	Conviction [2]
Jackson, Mrs. Emma N.	Berkley	Taunton	Apr. 17, 1941	Conviction
Medeiros, Joseph	Taunton	Taunton	Apr. 17, 1941	Conviction
Mickewicz, Anthony	North Wilmington	Woburn	July 10, 1941	Conviction
Noel, Felix	Granby	Northampton	Feb. 13, 1941	Conviction
Patch, Frank G.	Wilmington	Woburn	July 10, 1941	Conviction [1]
Patch, Frank G.	Wilmington	Woburn	July 10, 1941	Conviction
Simard, John D.	Pelham	Northampton	July 18, 1941	Conviction
Tumidajewicz, Jr., Joseph	Willimansett	Chicopee	Apr. 28, 1941	Conviction
Whitaker, Gowen [3]	Chester	Westfield	Apr. 17, 1941	Conviction
Representing Unpasteurized Milk as Pasteurized				
Angelo, Antone	New Bedford	New Bedford	Feb. 28, 1941	Discharged
Bean, Charles A.	Sherborn	Natick	May 2, 1941	Conviction
Bellerose, Rosaire	Charlton	Southbridge	Feb. 14, 1941	Conviction
Choiniere, Arthur [4]	Webster	Webster	Sept. 30, 1941	Conviction
Cronin, Joseph	Methuen	Methuen	Oct. 10, 1941	Conviction [2]
Cronin, William	Methuen	Methuen	Oct. 10, 1941	Conviction [2]
Dolinski, Michael	Westfield	Westfield	Aug. 7, 1941	Conviction
New Bedford Creamery, Inc.	New Bedford	New Bedford	Feb. 28, 1941	Discharged
Oaks Farm, Inc.	Cohasset	Quincy	Oct. 1, 1941	Conviction
Reynolds, Charles H.	Ludlow	Springfield	May 9, 1941	Conviction [2]
Robinson, James A.	Waltham	Waltham	Feb. 13, 1941	Dismissed
Souza, Manuel	Dartmouth	New Bedford	June 20, 1941	Conviction

[1] Guilty, $50 fine—suspended.
[2] Appealed.
[3] Two cases.
[4] A cream sample.

For Violation of Pasteurization Law and Regulations

Name	Address	Court	Date	Result
Harnisch, Ernest	Methuen	Lawrence	Jan. 13, 1941	Conviction [1]
Harper, David	Lancaster	Clinton	Aug. 19, 1941	Conviction
Hood & Sons, H. P., Inc.[2]	Charlestown	Charlestown	May 13, 1941	Conviction
Lanzillo, Frank	Wakefield	Malden	Feb. 26, 1941	Conviction
Pocius, Gus	Middleborough	Middleborough	Jan. 14, 1941	Conviction
Slosek, John	Ludlow	Springfield	May 16, 1941	Conviction
Slosek, Thomas	Ludlow	Springfield	May 16, 1941	Dismissed
Velantzas, Anastos	Lowell	Lowell	Jan. 20, 1941	Conviction
Velozo, John	Somerset	Fall River	Feb. 25, 1941	Conviction

For Violation of the Milk Grading Regulations

Clover Leaf Dairy, Inc.	Southbridge	Southbridge	July 28, 1941	Conviction
Hescock, Harry A.	Westfield	Westfield	July 31, 1941	Conviction
Hood & Sons, H. P., Inc.	Springfield	Springfield	Mar. 7, 1941	Conviction
Kobritz, Nathan	Pittsfield	Pittsfield	July 11, 1941	Conviction
Nelson, Frank	Charlton	Southbridge	July 28, 1941	Conviction
Rhinehart, Miller	Lanesborough	Pittsfield	July 23, 1941	Conviction
Weeks Creamery, Inc.	Chicopee	Chicopee	Apr. 11, 1941	Conviction

For Use of Unclean Utensils in Handling Milk

Miller, Edward J.	Amherst	Northampton	Apr. 30, 1941	Conviction
Munsell, Frank	Hampden	Springfield	Sept. 5, 1941	Conviction

For Sale of Adulterated or Misbranded Foods other than Milk and Milk Products

Clams

(Contained Added Water)

Botticelli, Anthony	Revere	Boston	May 6, 1941	Conviction [1]
Dow, George R.	Salisbury	Amesbury	Apr. 30, 1941	Conviction [3]
Savage, Carl	Rowley	Boston	May 6, 1941	Conviction
Stavis, I. W.	Boston	Boston	Sept. 30, 1941	Conviction

Hamburg Steak

(Contained Pork in Violation of the Regulations of the Department)

Bernstein, Hyman	Holyoke	Holyoke	Jan. 30, 1941	Conviction

Hamburg Steak

(Violation of the Law Relative to Use of Sodium Sulphite in Meat and Meat Products)

Alter, William	Roxbury	Roxbury	June 25, 1941	Conviction
Linchitz, Leonard	Woburn	Woburn	Feb. 12, 1941	Conviction
Marvin Food Co., Inc.	Somerville	Somerville	Nov. 19, 1941	Conviction
Pasquale, Enrico	Waltham	Waltham	Aug. 8, 1941	Conviction
Roover, Albert C.	South Boston	South Boston	Nov. 5, 1941	Conviction

Olive Oil

(Contained Edible Oil Other than Olive Oil)

Cimini, Paul	Pittsfield	Pittsfield	Sept. 4, 1941	Conviction
Dearo, Donald	Utica, N. Y.	Springfield	July 22, 1941	Conviction
Dearo, Donald	Utica, N. Y.	Pittsfield	Oct. 20, 1941	Conviction
Del Castello, Mary [4]	Southboro	Westboro	July 23, 1941	Discharged
Gandolfo, John	Boston	Somerville	June 11, 1941	Conviction
La Flatta, Antonio	North Attleborough	Attleboro	Dec. 3, 1940	Conviction
Lalos, Donatos	Southbridge	Southbridge	Nov. 5, 1941	Conviction
Manzi, L. A., Inc. [5]	Worcester	Southbridge	Mar. 21, 1941	Conviction
Mazzarelli & Sons, S., Inc. [4]	Milford	Milford	June 27, 1941	Conviction [1]
Moroni, Fred	Holyoke	Holyoke	July 17, 1941	Conviction
Previte, Dominick	Boston	Cambridge	Apr. 24, 1941	Conviction [1]
Rapallo, Joseph [4]	Medford	Malden	Apr. 29, 1941	Conviction
Teti, Joseph	Utica, N. Y.	Springfield	July 22, 1941	Conviction

Olive Oil

(Misbranded Oil)

Colicci, Luciano	Providence, R. I.	Southbridge	Apr. 30, 1941	Conviction
Mazzarelli & Sons, S., Inc.	Milford	Worcester	Sept. 10, 1941	Conviction
Previte, Dominick	Boston	Cambridge	Apr. 24, 1941	Conviction

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[1] Appealed.
[2] Involving 2 cases.
[3] Guilty, $100 fine: suspended and put on probation for 2 years.
[4] Involving 1 case of misbranding.
[5] Involving 3 counts on adulteration; 3 counts on misbranding.

For Sale of Adulterated or Misbranded Foods other than Milk and Milk Products — Continued

Name	Address	Court	Date	Result
Sausage and Sausage Meat				
(Violation of the Law Relative to Use of Sodium Sulphite in Meat and Meat Products)				
Alpert, Jennie	Roxbury	Roxbury	Feb. 28, 1941	Conviction
Big Bear Meat Department, Inc.	Cambridge	Cambridge	Sept. 26, 1941	Conviction
Consumers' Provision Co., Inc.	Worcester	Worcester	Apr. 25, 1941	Conviction
Contas Brothers, J. S., Inc.	Waltham	Waltham	Aug. 8, 1941	Conviction
Fiermont, Charles	Newton	Newton	Jan. 24, 1941	Conviction
Grupposo, Antonio	Natick	Natick	Jan. 14, 1941	Conviction
Pasquale, Enrico	Waltham	Waltham	Aug. 8, 1941	Conviction
Viscosi, Fillameo	Worcester	Worcester	Apr. 25, 1941	Conviction
Sausage and Sausage Meat				
(Excessive Cereal or Vegetable Substance)				
Colonial Provision Co., Inc.[1]	Boston	Boston	Sept. 30, 1941	Conviction
Colonial Provision Co., Inc.[1]	Boston	New Bedford	Nov. 12, 1941	Conviction
Colonial Provision Co., Inc.[1]	Boston	Fall River.	Nov. 14, 1941	Conviction
Colonial Provision Co., Inc.[1]	Boston	Taunton	Nov. 21, 1941	Conviction
Morrison, Hugh.	Everett	Boston	Mar. 21, 1941	Conviction
Omaha Packing Co., Inc.	Lowell	Fall River.	Sept. 11, 1941	Conviction
Omaha Packing Co., Inc.	Boston	Boston	Sept. 30, 1941	Conviction
Omaha Packing Co., Inc.[2]	Lowell	Worcester	Oct. 3, 1941	Conviction
United Sausage Co., Inc.	Lynn	Taunton	Nov. 7, 1941	Conviction

For Sale of Decomposed Food

Hamburg Steak				
Bernstein, Hyman	Holyoke	Holyoke	Jan. 30, 1941	Conviction
Cafferty, Anthony J.	Boston	Boston	Oct. 10, 1941	Conviction
Economy Grocery Stores Corp.	Hudson	Marlborough	Jan. 17, 1941	Conviction
Grenon, Simon	Marlborough	Marlborough	Jan. 17, 1941	Conviction
Kaplin, Jack	Woburn	Woburn	Feb. 12, 1941	Conviction
Linchitz, Leonard	Woburn	Woburn	Feb. 12, 1941	Conviction
Pasquale, Enrico	Waltham	Waltham	Aug. 8, 1941	Conviction
Shwachman, Philip	Boston	Boston	Aug. 1, 1941	Conviction
Terminal Markets, Inc.	Roxbury	Roxbury	June 9, 1941	Conviction
Lamb Patties				
Grand Union Co., Inc., The	Pittsfield	Pittsfield	Feb. 5, 1941	Conviction
Sausage and Sausage Meat				
Alpert, Jennie	Roxbury	Roxbury	Feb. 28, 1941	Conviction
Armour & Co. (2 counts)	Roxbury	Roxbury	Feb. 20, 1941	Discharged
Armour & Co.	Boston	Cambridge	Mar. 11, 1941	Conviction
Atlantic & Pacific Tea Co., The Great	Salem	Salem	Nov. 28, 1941	Conviction
Bellantoni, Joseph	Boston	Roxbury	Oct. 7, 1941	Conviction
Berkson, John	Charlestown	Charlestown	Nov. 21, 1941	Conviction[3]
Big Bear Meat Department, Inc.	Cambridge	Cambridge	Sept. 26, 1941	Conviction
Brockelman Brothers, Inc.[2]	Marlborough	Marlborough	Jan. 17, 1941	Conviction
Brockelman Brothers, Inc.	Marlborough	Marlborough	Oct. 6, 1941	Conviction
Cooper, David	Salem	Salem	Dec. 20, 1940	Conviction
Economy Grocery Stores Corp.	Springfield	Springfield	Jan. 7, 1941	Conviction[3]
Economy Grocery Stores Corp.	Cambridge	Cambridge	Feb. 24, 1941	Discharged
Economy Grocery Stores Corp.	Brockton	Brockton	Nov. 24, 1941	Conviction[3]
Elgart, Myer	Woburn	Woburn	Feb. 12, 1941	Conviction
Elias, James	Norwood	Dedham	Mar. 14, 1941	Discharged
Esaian, Paul	Boston	Boston	Jan. 23, 1941	Conviction
First National Stores, Inc.	Newton	Newton	Feb. 3, 1941	Conviction[3]
Foster, Dave	Charlestown.	Charlestown	Nov. 21, 1941	Conviction
Freedman, Joseph	Roxbury	Roxbury	Feb. 28, 1941	Conviction
Goldberg, J.	Boston	Boston	June 11, 1941	Conviction

[1] Doing business as State Sausage Co.
[2] Involving 2 cases.
[3] Appealed.

For Sale of Decomposed Food — Continued

SAUSAGE AND SAUSAGE MEAT—Concluded

NAME	ADDRESS	COURT	DATE	RESULT
Howes, Newton [1]	Holyoke	Holyoke	Jan. 30, 1941	Conviction
Jaffe, Harold	Pittsfield	Pittsfield	Feb. 5, 1941	Conviction
Jankowski, Konstanty	Norwood	Dedham	Jan. 23, 1941	Conviction
Kelsey's Market, Inc.	Great Barringgton	Great Barrington	Dec. 27, 1940	Conviction
Klys, Antonia	Palmer	Palmer	Mar. 7, 1941	Conviction
Krasnoff, Morris	Cambridge	Cambridge	Nov. 26, 1941	Conviction
Levy, Samuel	Pittsfield	Pittsfield	Feb. 19, 1941	Conviction
L'Heureux, Donat	Salem	Salem	Feb. 5, 1941	Discharged
Linchitz, Leonard	Woburn	Woburn	Feb. 12, 1941	Conviction
Liro, Joseph	Southbridge	Southbridge	Nov. 5, 1941	Conviction
Massachusetts Mohican Co., Inc., The [1]	Springfield	Springfield	Jan. 7, 1941	Conviction
Massachusetts Mohican Co., Inc., The	Salem	Salem	Oct. 16, 1941	Conviction [2]
McKenna, Joseph P.	Stoneham	Woburn	Feb. 4, 1941	Dismissed
McKenna, Thomas E.	Stoneham	Woburn	Feb. 4, 1941	Dismissed
Miller, Louis	Charlestown	Charlestown	Nov. 21, 1941	Conviction
Mohican Market, Inc.	Newton	Newton	Apr. 21, 1941	Conviction
Morino, Ermando	Norwood	Dedham	Mar. 14, 1941	Discharged
Neighborhood Stores, Inc.	Athol	Athol	Dec. 16, 1940	Conviction
Neway Market, Inc.	Chicopee	Chicopee	Jan. 10, 1941	Discharged
New England Market, Inc.	Cambridge	Cambridge	Jan. 22, 1941	Conviction
O'Loughlin, Michael	South Boston	South Boston	Jan. 28, 1941	Conviction
Omer, Richard	Springfield	Springfield	Dec. 20, 1940	Conviction
Quink, Francis	Belchertown	Northampton	Dec. 19, 1940	Conviction
Ritso, William	Norwood	Dedham	Feb. 19, 1941	Conviction
Saletsky, Jack	Boston	Boston	Aug. 7, 1941	Conviction
Solin's Market, Inc.	Chicopee	Chicopee	Jan. 3, 1941	Conviction
Squire Company, John P.	Cambridge	Salem	Nov. 18, 1941	Conviction
St. Amand, Adrian	Holyoke	Holyoke	Feb. 18, 1941	Conviction
Tillman, Herbert	Springfield	Springfield	Jan. 7, 1941	Conviction
Torelli, Emilio	Framingham	Framingham	Feb. 6, 1941	Conviction
Viera, Manuel	Cambridge	Cambridge	Nov. 17, 1941	Conviction
White Star Foods, Inc.	Waltham	Waltham	Aug. 8, 1941	Conviction
Willworth, Frank G.	Boston	Boston	June 1, 1941	Conviction [3]

Using Decomposed Eggs in the Manufacture of Food Products

Vigeant, Louis E.	Southbridge	Southbridge	June 20, 1941	Conviction

For Violation of Sanitary Food Law

Bence Pharmacy, Inc.	Cambridge	Cambridge	June 13, 1941	Conviction
Berger's, Bob, Inc.	Boston	Boston	July 14, 1941	Conviction
Cataldo, Angelo [3]	Boston	Boston	July 9, 1941	Conviction
Cataldo, Angelo.	Boston	Boston	July 9, 1941	Dismissed
Gillispee, John E.	Stoneham	Woburn	Sept. 27, 1941	Conviction
Greylock Confectionery Corp. [3]	Cambridge	Cambridge	June 10, 1941	Conviction
Harvard Grill Garden, Inc.	Cambridge	Cambridge	July 7, 1941	Conviction
Johnson Co., Howard D.	Andover	Lawrence	Aug. 27, 1941	Conviction
Scollo, Pasquale.	North Reading	Woburn	Aug. 29, 1941	Conviction
Scollo, Pasquale.	North Reading	Woburn	Sept. 12, 1941	Conviction
Vigeant, Louis E.	Southbridge	Southbridge	June 20, 1941	Conviction
Waldorf System, Inc.	Cambridge	Cambridge	July 7, 1941	Conviction
Walton Lunch Co.	Boston	Boston	Sept. 26, 1941	— [4]
Wursthaus Restaurant, Inc.	Cambridge	Cambridge	July 7, 1941	Conviction

For Violation of Bakery Laws

Brockton Public Market, Inc.	New Bedford	New Bedford	Oct. 17, 1941	Conviction
Fishman, Harry.	Springfield	Springfield	May 20, 1941	Conviction
Fishman, Harry.	Springfield	Springfield	Sept. 19, 1941	Conviction
Purity Bakeries, Inc. [1]	Springfield	Springfield	Jan. 24, 1941	Conviction
Sternman, John	Springfield	Springfield	May 20, 1941	Dismissed
Sternman, John	Springfield	Springfield	Sept. 19, 1941	Conviction
Waltham Baking Co., The [3]	Waltham	Waltham	June 20, 1941	Conviction

[1] Two counts.
[2] Appealed.
[3] Involving 2 cases.
[4] Dismissed for want of prosecution.

For Violation of Law and Regulations Relative to the Manufacture and Bottling of Carbonated Nonalcoholic Beverages, Soda Water, Mineral and Spring Water

Name	Address	Court	Date	Result
Chruscial, Jacob	Everett	Malden	Aug. 14, 1941	Conviction
Czerwonka, Walter	Fall River	Fall River	May 1, 1941	Conviction
Davis Co., George A.	Gloucester	Gloucester	May 7, 1941	Conviction
Dobbs Beverage Co.	Leicester	Worcester	July 24, 1941	Conviction
Rozbicki, Stanley	Everett	Malden	Aug. 14, 1941	Dismissed
Thomas Beverage Co.	Malden	Malden	Aug. 26, 1941	Conviction

For Sale of an Adulterated Drug not Conforming to the Requirements of the U. S. Pharmacopoeia

Johnson Wholesale Perfume Co., Inc.	Springfield	Springfield	Jan. 8, 1941	Conviction [1]

For Violation of Law Pertaining to Bedding and Upholstered Furniture

American Upholstering Corp., The	Waterbury, Conn.	Springfield	Feb. 5, 1941	Conviction
Berkshire Upholstered Furniture Co. [2]	Springfield	Worcester	Oct. 3, 1941	Conviction
Boston Dry Goods Mfg. Co.	Boston	Boston	Jan. 7, 1941	Conviction
Boyatzi, Kyriaco	Worcester	Worcester	July 28, 1941	Conviction
Buchman Co., Inc., The L.	Brooklyn, N. Y.	Boston	Jan. 7, 1941	Conviction
Buchman Co., Inc., The L.	Brooklyn, N. Y.	Worcester	Jan. 9, 1941	Conviction
Chuker, Pinkus	Boston	Boston	Jan. 7, 1941	Conviction
Chuker, Pinkus	Boston	Boston	Feb. 13, 1941	Conviction
Comfort Pillow & Feather Co. [2]	Somerville	Boston	Nov. 6, 1941	Conviction
Denholm & McKay Co.	Worcester	Worcester	Jan. 9, 1941	Dismissed
Ehrlich Inc., Charles J.	New Bedford	New Bedford	July 31, 1941	Conviction
Feinberg, William	Chelsea	Boston	Oct. 6, 1941	Conviction
General Mattress Co.	Fall River	Fall River	July 24, 1941	Conviction [1]
Gilchrist Co.	Boston	Boston	Dec. 17, 1940	Conviction
Goodrest Trading Corp.	Springfield	Fitchburg	May 20, 1941	Conviction
Hadley Co., The	Springfield	Springfield	Feb. 5, 1941	Discharged
Hartford Mattress Co., Inc.	Hartford, Conn.	Springfield	July 10, 1941	Conviction
Hutner, Etta	Springfield	Springfield	Feb. 26, 1941	Conviction
Jordan Marsh Co.	Boston	Boston	Dec. 17, 1940	Conviction
Jordan Marsh Co.	Boston	Boston	Jan. 17, 1941	Dismissed
Lavine, Edward I. [3]	New Haven, Conn.	Fall River.	Jan. 16, 1941	Conviction
Lincoln Stores, Inc.	Lowell	Lowell	July 21, 1941	Dismissed
Lincoln Stores, Inc.	Fitchburg	Fitchburg	July 22, 1941	Dismissed
Lullaby Products Co.	Carnegie, Pa.	Lowell	July 21, 1941	Conviction
Lullaby Products Co.	Carnegie, Pa.	Fitchburg	July 22, 1941	Conviction
Metropolitan Furniture Co.	Springfield	Springfield	Feb. 5, 1941	Discharged
Moller's Inc.	Cambridge	Cambridge	Dec. 3, 1940	Conviction
New England Dry Goods Co.	Boston	Boston	Jan. 7, 1941	Conviction
New England Furniture Corp.	Pittsfield	Pittsfield	Feb. 27, 1941	Conviction
Reliable Upholstering Corp.	Cambridge	Fall River.	Apr. 17, 1941	Discharged
Russell Furniture Co., Inc., Ellis H.	Salem	Salem	Apr. 1, 1941	Conviction [1]
Sears Roebuck & Co.	Pittsfield	Pittsfield	Feb. 27, 1941	Conviction
Scharco Mfg. Co., Inc.	New York, N. Y.	Boston	July 18, 1941	Conviction
Sherer Co., Inc., C. T.	Worcester	Worcester	Jan. 9, 1941	Dismissed
Sherman, Isadore [2]	Chelsea	Boston	Oct. 6, 1941	Conviction
Simon & Sons, Inc., A.	Framingham	Framingham	June 3, 1941	Conviction
Solbro Batting Co., Inc.	Worcester	Gardner	Nov. 27, 1941	Conviction
Stillman Co., John [2]	Springfield	Springfield	Feb. 5, 1941	Discharged
Velsco, Inc.	New York, N. Y.	Southbridge	Oct. 10, 1941	Conviction
Victory Mattress Co., Inc.	Boston	Boston	Nov. 6, 1941	Conviction
White Co., R. H.	Boston	Boston	Jan. 7, 1941	Conviction
Wilson, Fred	Pittsfield	Pittsfield	Feb. 27, 1941	Conviction

Obstruction of an Inspector of the Department of Public Health

Astuti, Frank	Boston	Boston	Apr. 15, 1941	Conviction

[1] Appealed.
[2] Involving 2 cases.
[3] Doing business as New Haven Quilt Co., New Haven.

TABLE 2.— *Summary of Milk Statistics*

Number of samples above standard	6,279
Number of samples below	716
Total samples	6,995
Number having more than 15% solids	32
Number having between 14% and 15% solids	270
Number having between 13% and 14% solids	1,907
Number having between 12% and 13% solids	4,070
Number having between 11% and 12% solids	656
Number having between 10% and 11% solids	43
Number having between 9% and 10% solids	14
Number having between 8% and 9% solids	3
Number showing removal of cream	50
Number showing addition of water	76

TABLE 3.— *Average Composition of Milk Samples*

	Total Samples				Samples Not Declared Adulterated			
	Number of Samples	Total Solids %	Fat %	Solids not Fat %	Number of Samples	Total Solids %	Fat %	Solids not Fat %
December	363	12.92	4.06	8.86	359	12.93	4.07	8.86
January	413	12.76	3.96	8.82	397	12.85	3.99	8.86
February	712	12.87	4.01	8.86	703	12.89	4.02	8.87
March	652	12.84	3.95	8.89	629	12.89	3.97	8.92
April	642	12.82	3.99	8.83	633	12.84	4.00	8.84
May	692	12.73	3.96	8.77	682	12.73	3.97	8.76
June	611	12.59	3.94	8.65	587	12.66	3.97	8.69
July	610	12.50	3.86	8.64	600	12.53	3.88	8.65
August	625	12.57	3.95	8.62	617	12.59	3.97	8.62
September	440	12.71	3.98	8.73	438	12.72	3.99	8.73
October	688	12.84	4.02	8.83	683	12.84	4.03	8.81
November	415	12.82	4.00	8.82	409	12.83	4.00	8.83
Average for year	6,863	12.75	3.97	8.78	6,737	12.77	3.98	8.79

TABLE 4.— *Summary of Bacteriological Examinations of Milk*

	Samples Examined In Boston		In Westfield	
Certified Milk				
Total Samples		84		11
Samples with count below 10,000		83		5
Samples with count above 10,000		1		6
Highest count	17,000		450,000	
Lowest count	500		3,000	
Geometric Mean	2,450		15,241	
Pasteurized Certified Milk				
Total Samples		73		2
Samples with count below 500		71		2
Samples with count above 500		2		–
Highest count	550		200	
Lowest count	less than 10		100	
Geometric Mean	29		140	
Grade A Raw Milk				
Total Samples		8		26
Samples with count below 100,000		7		23
Samples with count above 100,000		1		3
Highest count	620,000		422,000	
Lowest count	13,000		2,300	
Geometric Mean	9,446		18,160	
Grade A Pasteurized Milk				
Total Samples		146		111
Samples with count below 10,000		122		74
Samples with count above 10,000		24		37
Highest count	1,000,000		2,000,000	
Lowest count	less than 100		200	
Geometric Mean	2,787		4,512	
Pasteurized Milk				
Total Samples		2,725		1,135
Samples with count below 25,000		1,755		719
Samples with count below 40,000		1,966		847
Samples with count above 40,000		759		288
Highest count	4,000,000		10,000,000	
Lowest count	less than 100		100	
Geometric Mean	14,487		14,425	

TABLE 4.— *Summary of Bacteriological Examinations of Milk* — Concluded

	Samples Examined In Boston		Samples Examined In Westfield	
Special Milk Pasteurized				
Total Samples		6		1
Samples with count below 5,000		6		1
Samples with count above 5,000		–		–
Highest count	4,700		800	
Lowest count	350		–	
Geometric Mean	1,235		800	
Raw Milk to be Pasteurized				
Total Samples		2,513		833
Samples with count below 100,000		1,635		584
Samples with count below 250,000		2,046		669
Samples with count below 400,000		2,217		704
Samples with count above 400,000		296		129
Highest count	3,800,000		5,200,000	
Lowest count	200		1,000	
Geometric Mean	42,658		49,934	
Raw Milk to be Pasteurized—Grade A				
Total Samples		84		3
Samples with count below 100,000		57		3
Samples with count above 100,000		21		–
Highest count	487,000		87,000	
Lowest count	300		12,000	
Geometric Mean	48,084		31,406	
Raw Milk Sold as Such				
Total Samples		289		474
Samples with count below 100,000		224		332
Samples with count below 400,000		258		429
Samples with count above 400,000		31		45
Highest count	4,200,000		5,900,000	
Lowest count	800		1,000	
Geometric Mean	50,119		48,944	
Special Raw Milk				
Total Samples		–		7
Samples with count below 50,000		–		6
Samples with count above 50,000		–		1
Highest count	–		230,000	
Lowest count	–		3,000	
Geometric Mean	–		9,311	
Cream				
Total Samples		276		17
Samples with count below 100,000		195		12
Samples with count above 100,000		81		9
Highest count	4,100,000		5,000,000	
Lowest count	100		11,200	
Geometric Mean	154,000		300,275	

TABLE 5.— *Summary of Analyses of Food Samples*

Character of Sample	Not Declared Adulterated or Misbranded	Adulterated or Misbranded	Total
Butter	72	11	83
Cheese	33	13	46
Clams	37	48	85
Cream	304	21	325
Frozen desserts	226	2	228
Flavoring extracts	12	1	13
Fruit juices	11	–	11
Maple products	17	3	20
Meat products:			
Chops	4	1	5
Hamburg steak	140	24	164
Lamb and meat patties	19	4	23
Poultry	2	–	2
Sausage	192	113	305
Miscellaneous*	30	12	42
Olive Oil	85	84	169
Preserved fruits	11	–	11
Soft drinks	6	1	7
Vinegar	58	12	70
Totals	1,259	350	1,609

*Includes individual items totaling less than 5.

TABLE 6.— *Articles Other than Fish Placed in Cold Storage from December 1, 1940, to December 1, 1941*

	Butter (lbs.)	Eggs (Dozens)	Broken-out Eggs (lbs.)	Broilers (lbs.)	Roasters (lbs.)	Fowls (lbs.)	Turkeys (lbs.)	Ducks (lbs.)	Miscellaneous Poultry (lbs.)	Beef (lbs.)	Pork (lbs.)	Lamb and Mutton (lbs.)	Miscellaneous Meats (lbs.)
December	194,101	205,110	827,075	134,376	832,860	476,003	5,068,901	42,871	602,684	961,572	3,298,833	108,885	1,630,561
January	180,600	81,030	610,720	80,873	561,038	422,136	1,285,526	7,707	299,261	707,691	4,584,192	106,327	1,161,736
February	180,389	70,020	740,832	53,044	462,192	278,857	558,480	7,179	113,104	455,355	1,681,765	131,385	680,249
March	261,804	106,590	1,174,060	114,235	298,932	201,419	729,441	41,378	112,568	724,200	1,126,752	219,388	596,704
April	457,754	1,449,030	2,242,374	109,457	270,197	173,867	1,091,610	44,097	307,206	1,106,559	2,045,584	142,438	868,755
May	1,696,116	1,937,370	2,020,965	108,979	376,400	208,319	982,948	281,995	198,522	1,161,184	1,401,409	114,255	926,498
June	3,119,266	1,027,770	1,918,912	121,594	242,638	415,270	594,995	371,246	196,433	1,112,515	2,237,526	27,800	1,085,511
July	2,397,244	630,330	1,893,448	237,551	273,389	355,531	667,503	341,504	172,096	731,154	1,482,354	77,003	1,006,962
August	912,551	288,600	867,930	274,127	242,420	305,626	430,993	180,082	211,228	1,042,659	1,399,046	52,393	1,021,898
September	606,900	254,460	699,636	401,183	683,542	714,560	364,067	116,909	277,068	861,696	2,108,209	44,337	716,098
October	666,292	206,130	594,005	284,914	1,191,473	1,463,728	370,338	105,793	271,004	975,907	1,496,156	139,297	1,199,597
November	317,482	46,290	830,535	162,921	1,223,270	451,770	1,588,482	65,192	490,917	1,024,858	1,909,367	183,355	1,215,738

TABLE 7.— *Articles Other than Fish on Hand in Cold Storage on the First Day of the Month from January 1, 1941, through December 1, 1941*

	Butter (lbs.)	Eggs (Dozens)	Broken-out Eggs (lbs.)	Broilers (lbs.)	Roasters (lbs.)	Fowls (lbs.)	Turkeys (lbs.)	Ducks (lbs.)	Miscellaneous Poultry (lbs.)	Beef (lbs.)	Pork (lbs.)	Lamb and Mutton (lbs.)	Miscellaneous Meats (lbs.)
January	1,124,806	224,580	1,454,174	368,861	2,187,664	1,053,008	6,603,892	639,563	851,157	1,860,727	4,664,094	363,097	2,795,647
February	605,341	92,340	1,103,664	297,722	2,148,433	806,400	7,006,001	436,743	824,176	1,915,150	7,996,660	320,796	2,760,500
March	427,062	65,130	979,874	231,277	1,979,846	705,125	6,045,355	250,536	713,490	1,803,025	8,270,290	308,186	2,537,276
April	408,213	97,350	1,230,799	216,001	1,526,232	384,334	4,895,133	50,162	607,926	1,947,797	8,214,843	364,055	2,195,277
May	550,610	1,457,280	2,448,764	189,678	1,176,300	284,050	3,964,398	21,882	662,309	2,245,055	8,530,869	354,811	2,186,506
June	1,949,465	2,912,310	3,210,849	220,178	971,567	335,200	3,423,935	280,847	687,053	2,408,954	7,017,898	344,893	2,109,066
July	4,413,754	3,537,450	3,930,791	264,352	762,139	519,198	2,717,491	633,936	641,302	2,492,441	6,114,933	263,921	1,886,551
August	6,126,462	3,490,650	4,794,141	286,796	595,905	676,443	1,977,814	948,791	548,819	2,167,968	4,384,257	210,569	1,770,511
September	6,248,956	3,028,110	4,609,969	404,147	500,561	759,919	1,140,259	1,028,240	573,982	2,077,892	3,003,733	163,116	1,358,222
October	6,184,702	2,674,350	4,020,918	698,718	930,509	1,216,452	642,787	1,116,513	733,079	1,980,668	2,397,431	126,576	1,047,249
November	5,868,571	1,664,880	2,943,801	836,357	1,847,113	2,461,784	371,748	1,052,929	782,760	2,063,550	2,016,914	165,049	1,113,527
December	4,998,700	626,640	2,727,271	897,484	2,862,972	2,743,987	1,421,429	858,933	1,104,296	2,381,364	2,735,274	262,944	1,201,067

TABLE 8.— *Fish Placed in Cold Storage from December 15, 1940 to December 15, 1941*

	Bluefish (lbs.)	Butterfish (lbs.)	Catfish (lbs.)	Cod, Hake, Pollock and Haddock (lbs.)	Cod Fillets (lbs.)	Flounders (lbs.)	Haddock Fillets (lbs.)	Halibut (lbs.)	Herring (lbs.)	Mackerel (lbs.)	Pollock Fillets (lbs.)
January	2,946	5,792	2,001	132,235	100,015	191,150	421,455	101,135	40,888	58,846	1,501,255
February	1,673	2,490	1,371	101,283	125,920	109,186	1,318,623	143,969	39,135	91,697	284,776
March	863	1,891	385	52,496	70,360	19,520	1,268,425	183,548	559,860	90,019	14,905
April	719	11,595	1,648	105,441	389,961	42,690	1,830,396	104,652	207,645	89,758	171,240
May	658	1,627	20,450	136,452	897,135	69,470	2,580,359	6,533	186,031	142,241	391,180
June	4,716	29,606	5,069	230,403	802,149	131,130	3,205,407	25,117	275,499	1,363,093	133,775
July	6,482	81,961	3,545	177,000	793,905	113,675	3,766,325	33,031	70,721	357,932	339,725
August	188	62,998	1,416	152,749	531,545	92,745	3,557,790	27,053	73,498	2,092,484	113,896
September	9,502	34,432	2,020	165,328	296,141	249,562	3,584,628	80,679	53,689	1,549,897	156,462
October	11,682	36,755	124	154,850	291,070	209,332	2,348,959	130,414	304,950	2,189,681	562,947
November	1,394	11,718	2,440	284,566	1,311,045	75,070	774,206	242,828	496,095	2,116,679	2,692,475
December	–	3,179	1,420	178,183	421,922	78,520	829,263	253,832	237,780	279,131	3,929,340

	Redfish Fillets (lbs.)	Fall and Silver Salmon (lbs.)	Salmon, all Others (lbs.)	Scup (lbs.)	Shad (lbs.)	Shellfish (lbs.)	Smelts, Eulachon, etc. (lbs.)	Squid (lbs.)	Swordfish lbs.)	Whiting (lbs.)	Miscellaneous Frozen Fish (lbs.)
January	1,464,022	51,688	9,066	1,350	10	84,040	357,098	27,201	165,857	152,485	241,234
February	1,217,139	69,516	21,900	–	57	76,584	566,767	46,335	60,145	188,863	135,229
March	1,489,205	51,436	9,530	–	108	31,643	546,912	41,249	17,804	204,635	72,735
April	2,476,860	42,243	16,258	875	246	35,674	57,705	18,057	18,964	202,050	83,457
May	3,503,678	4,672	2,037	3,050	4,614	166,184	11,919	20,566	64,160	100,798	181,114
June	3,618,392	3,337	3,365	48,169	8,878	255,115	345	442,042	11,969	2,216,632	217,947
July	2,911,252	28,148	64,760	66,174	3,604	282,771	675	122,385	79,665	7,490,637	297,278
August	3,833,532	4,352	1,745	4,393	2,410	423,623	1,625	214,360	377,245	8,748,857	669,153
September	3,777,944	71,201	37,200	8,477	400	182,783	3,240	223,520	198,665	5,130,342	514,347
October	3,460,267	7,890	1,935	415	195	270,094	7,697	179,282	21,734	2,792,197	426,285
November	3,318,408	59,182	80,925	11,199	2,290	463,736	59,502	86,045	52,183	1,408,952	495,255
December	1,755,248	157,620	585	700	31,595	376,076	40,682	49,445	3,468	179,356	229,687

TABLE 9.— *Fish on Hand in Cold Storage on the Fifteenth Day of the Month from January 15, 1941, through December 15, 1941*

	Bluefish (lbs.)	Butterfish (lbs.)	Catfish (lbs.)	Cod, Hake, Pollock and Haddock (lbs.)	Cod Fillets (lbs.)	Flounders (lbs.)	Haddock Fillets (lbs.)	Halibut (lbs.)	Herring (lbs.)	Mackerel (lbs.)	Pollock Fillets (lbs.)
January	8,598	82,584	1,271	606,754	1,403,653	562,744	2,008,293	101,067	588,515	4,215,365	5,504,408
February	3,453	53,724	1,052	496,520	932,830	425,513	1,619,664	145,521	458,452	2,795,877	4,347,809
March	1,869	16,412	402	321,713	463,088	123,286	1,098,911	99,372	726,290	1,388,970	2,776,196
April	1,642	15,743	1,010	255,982	440,990	52,381	1,231,979	66,483	399,666	374,230	1,615,018
May	1,364	10,514	12,895	177,005	1,033,854	67,188	2,046,552	52,921	468,045	324,409	1,131,326
June	5,273	32,404	8,402	267,517	1,399,418	142,861	3,236,319	60,909	561,769	1,528,422	472,800
July	8,973	106,364	4,625	269,303	1,463,583	180,406	3,945,211	63,428	487,314	1,473,186	383,735
August	7,774	161,275	3,116	253,544	948,191	188,084	4,863,981	63,087	424,092	2,845,168	235,186
September	15,489	180,234	4,270	300,097	576,337	370,697	5,933,054	114,657	394,769	3,652,565	116,016
October	22,358	203,163	3,473	277,311	509,882	368,071	5,901,377	111,220	527,796	5,295,757	217,921
November	18,905	186,856	4,391	436,641	1,361,763	275,691	4,114,541	225,818	829,423	6,296,925	2,042,469
December	15,820	167,251	4,790	458,907	1,476,674	238,317	3,491,415	363,542	798,820	5,402,857	4,810,064

	Redfish Fillets (lbs.)	Fall and Silver Salmon (lbs.)	Salmon, all Others (lbs.)	Scup (lbs.)	Shad (lbs.)	Shellfish (lbs.)	Smelts, Eulachon, etc. (lbs.)	Squid (lbs.)	Swordfish (lbs.)	Whiting (lbs.)	Miscellaneous Frozen Fish (lbs.)
January	918,540	76,375	43,216	18,345	44,211	961,010	461,775	396,437	317,393	4,731,646	1,453,123
February	411,128	63,405	48,403	8,587	42,511	717,697	846,297	273,557	184,103	3,251,862	1,240,033
March	295,303	57,427	33,223	3,738	39,085	384,231	1,189,052	178,818	89,764	1,147,493	965,659
April	926,391	33,202	18,978	3,055	27,753	173,753	970,573	40,113	18,929	145,439	777,501
May	2,236,877	2,655	2,071	3,394	16,827	200,445	816,440	23,739	50,139	99,599	800,621
June	3,598,034	4,864	3,942	51,513	22,579	353,383	757,351	459,469	19,224	1,179,623	769,500
July	3,727,799	15,378	55,478	117,622	25,412	488,599	702,845	530,109	67,549	5,545,201	808,273
August	3,335,612	15,486	50,612	121,924	23,282	640,911	640,830	628,949	424,131	9,633,275	1,150,233
September	3,478,046	82,366	69,382	130,301	21,432	652,616	553,172	633,358	588,215	9,832,313	1,230,556
October	3,224,279	58,272	58,944	121,020	19,134	699,788	446,913	550,207	444,240	8,847,852	1,239,358
November	3,664,937	65,081	116,124	104,386	20,242	971,918	391,196	536,365	333,115	7,185,314	1,391,390
December	3,107,903	158,120	71,489	85,618	45,991	1,213,455	212,741	395,754	212,076	5,344,504	1,249,546

TABLE 10.— *Requests for Extension of Time Granted on Goods in Cold Storage, from December 1, 1940, to December 1, 1941*

(Reason for such extension being that goods were in proper condition for further storage.)

ARTICLE	Weight (Pounds)	Placed in Storage	Extension Granted to	Name
Sugar Yolks	750	Apr. 22, 1940	July 1, 1941	Standard Brands, Inc.
Sugar Yolks	2,430	May 1, 1940	Aug. 1, 1941	Wilson & Co.
Sugar Yolks	3,000	June 25, 1940	Sept. 25, 1941	Wilson & Co.
Voltex	250	May 3, 1940	Aug. 1, 1941	Standard Brands, Inc.
Voltex	38,700	May 23, 1940	Aug. 23, 1941	Standard Brands, Inc.
Voltex	500	May 27, 1941	Aug. 27, 1941	Standard Brands, Inc.
Voltex	2,430	May 31, 1940	Aug. 31, 1941	Standard Brands, Inc.
Voltex	11,370	June 11, 1940	Aug. 21, 1941	Standard Brands, Inc.
Voltex	750	June 10, 1940	Sept. 10, 1941	Standard Brands, Inc.
Egg Whites	750	Apr. 19, 1940	July 19, 1941	Armour & Co.
Egg Whites	1,860	†Apr. 8, 1939	Mar. 22, 1941	The Emulsol Corp.
Egg Whites	1,140	Apr. 1, 1940	July 1, 1941	Standard Brands, Inc.
Egg Whites	450	Apr. 26, 1940	Aug. 1, 1941	Standard Brands, Inc.
Egg Whites	800	May 21, 1940	Aug. 21, 1941	Standard Brands, Inc.
Egg Whites	750	May 29, 1940	Aug. 27, 1941	Standard Brands, Inc.
Egg Whites	35,970	†Apr. 1940	*Dec. 1, 1941	Swift & Co.
Egg Whites	17,820	May, 1940	Aug. 1, 1941	Swift & Co.
Egg Whites	2,730	May, 1940	*Dec. 1, 1941	Swift & Co.
Egg Whites	5,550	May 1, 1940	Aug. 1, 1941	Wilson & Co.
Whole Eggs	3,000	June 3, 1940	Aug. 21, 1941	Standard Brands, Inc.
Whole Eggs	6,060	May 20, 1940	Aug. 1, 1941	Wilson & Co.
Whole Eggs	3,150	May 30, 1940	Sept. 25, 1941	Wilson & Co.
Chicken	7,042	Oct. 10, 1940	Feb. 10, 1942	Benson Bros. Corp.
Geese	677	Dec. 2, 1939	June 1, 1941	Berman & Co., Inc.
Geese (2 lots)	453	Feb. 23, 1940	Aug. 23, 1941	Berman & Co., Inc.
Roasters	1,118	July 1, 1940	Dec. 1, 1941	Frosted Foods Sales Corp.
Roasters	3,388	July 4, 1940	Dec. 1, 1941	Frosted Foods Sales Corp.
Turkeys (4 lots)	3,440	Dec. 1, 1939	June 1, 1941	Berman & Co., Inc.
Turkeys (2 lots)	1,225	Dec. 4, 1939	June 1, 1941	Berman & Co., Inc.
Turkeys	1,471	Dec. 8, 1939	June 8, 1941	Berman & Co., Inc.
Turkeys (2 lots)	1,129	Dec. 12, 1939	June 12, 1941	Berman & Co., Inc.
Turkeys	2,510	Dec. 28, 1939	June 8, 1941	Berman & Co., Inc.
Turkeys (2 lots)	2,521	Dec. 29, 1939	June 12, 1941	Berman & Co., Inc.
Turkeys	2,379	Jan. 23, 1940	June 23, 1941	Berman & Co., Inc.
Turkeys	632	Jan. 26, 1940	June 23, 1941	Berman & Co., Inc.
Turkeys (2 lots)	2,640	Feb. 1, 1940	*Jan. 1, 1942	Dewey & Almy Chemical Co.
Turkeys	269	†Nov. 16, 1939	Sept. 1, 1941	Frosted Foods Sales Corp.
Turkeys	405	†Nov. 22, 1939	June 1, 1941	Frosted Foods Sales Corp.
Turkeys	453	†Nov. 22, 1939	Sept. 1, 1941	Frosted Foods Sales Corp.
Turkeys (2 lots)	1,386	†Dec. 5, 1939	June 1, 1941	Frosted Foods Sales Corp.
Turkeys (3 lots)	2,911	†Dec. 8, 1939	June 1, 1941	Frosted Foods Sales Corp.
Turkeys (4 lots)	3,791	†Dec. 11, 1939	June 1, 1941	Frosted Foods Sales Corp.
Turkeys	143	†Dec. 12, 1939	Sept. 1, 1941	Frosted Foods Sales Corp.
Turkeys (4 lots)	12,898	†Dec. 18, 1939	June 1, 1941	Frosted Foods Sales Corp.
Turkeys	1,436	†Dec. 20, 1939	June 1, 1941	Frosted Foods Sales Corp.
Turkeys	1,139	†Dec. 27, 1939	June 1, 1941	Frosted Foods Sales Corp.
Turkeys (5 lots)	21,658	Dec. 2, 1939	Apr. 2, 1941	Quincy Market, C. S. & W. Co.
Beef Kidneys	6,873	May 29, 1940	Nov. 29, 1941	Mades Co., Inc., M. M.
Calves' Livers	5,460	Nov. 15, 1940	Mar. 15, 1942	Beane Co., H. E.
Chopped Steak	7,020	†Oct. 24, 1939	June 1, 1941	Frosted Foods Sales Corp.
Chopped Steak (2 lots)	56,700	†Feb. 26, 1940	Aug. 1, 1941	Frosted Foods Sales Corp.
Chopped Steak	13,860	Feb. 27, 1940	Aug. 1, 1941	Frosted Foods Sales Corp.
Chopped Steak	14,040	†Mar. 5, 1940	Aug. 1, 1941	Frosted Foods Sales Corp.
Chopped Steak	19,620	†Mar. 12, 1940	Aug. 1, 1941	Frosted Foods Sales Corp.
Chopped Steak	38,040	†Mar. 25, 1940	Aug. 1, 1941	Frosted Foods Sales Corp.
Chopped Steak	54,480	Apr. 9, 1940	*Dec. 31, 1941	Frosted Foods Sales Corp.
Rump Steak	2,184	†Dec. 19, 1939	July 1, 1941	Frosted Foods Sales Corp.
Sirloin Steaks	114	†Jan. 8, 1940	Sept. 1, 1941	Frosted Foods Sales Corp.
Lamb Flanks	3,650	Nov. 1, 1940	Mar. 1, 1942	Folsom's Market, Inc.
Lamb Flanks	1,000	Nov. 4, 1940	Jan. 1, 1942	Folsom's Market, Inc.
Lamb Fores	634	†Nov. 8, 1939	June 1, 1941	Frosted Foods Sales Corp.
Lamb Fores	4,452	†Dec. 7, 1939	June 1, 1941	Frosted Foods Sales Corp.
Lamb Legs	1,214	†Feb. 23, 1939	Sept. 1, 1941	Frosted Foods Sales Corp.
Lamb Legs	898	†Nov. 17, 1939	June 1, 1941	Frosted Foods Sales Corp.
Pork Loin Roasts	778	†Dec. 16, 1938	*Dec. 31, 1941	Frosted Foods Sales Corp.
Pork Loin Roasts	3,082	†Nov. 13, 1939	*Dec. 1, 1941	Frosted Foods Sales Corp.
Spare Ribs	7,500	Jan. 27, 1940	Mar. 31, 1941	United Markets, Inc.
Dog Meat	60	May 19, 1939	Dec. 31, 1941	Smith, E. H.
Dog Meat	100	June 29, 1939	Dec. 31, 1941	Smith, E. H.
Dog Meat	40	July 14, 1939	Dec. 31, 1941	Smith, E. H.
Dog Meat	90	July 26, 1939	Dec. 31, 1941	Smith, E. H.
Dog Meat	60	Aug. 3, 1939	Dec. 31, 1941	Smith, E. H.
Dog Meat	40	Sept. 20, 1939	Dec. 31, 1941	Smith, E. H.
Dog Meat	120	Sept. 22, 1939	Dec. 31, 1941	Smith, E. H.
Dog Meat	440	Oct. 11, 1939	Dec. 31, 1941	Smith, E. H.
Dog Meat	360	Oct. 20, 1939	Dec. 31, 1941	Smith, E. H.

*The extension of time granted on this lot was amended before the expiration of the time to which extended. The length of time given includes the total amended period, and the weights given are the initial weights upon which extensions were asked.

†Previously frozen.

TABLE 10.— *Requests for Extension of Time Granted on Goods in Cold Storage, from December 1, 1940 to December 1, 1941* — Concluded

ARTICLE	Weight (Pounds)	Placed in Storage	Extension Granted to	Name
Dog Meat	520	Oct. 30, 1939	Dec. 31, 1941	Smith, E. H.
Dog Meat	40	Nov. 10, 1939	Dec. 31, 1941	Smith, E. H.
Dog Meat	280	Nov. 17, 1939	Dec. 31, 1941	Smith, E. H.
Dog Meat	320	Nov. 22, 1939	Dec. 31, 1941	Smith, E. H.
Dog Meat	200	Nov. 29, 1939	Dec. 31, 1941	Smith, E. H.
Dog Meat	80	Mar. 29, 1940	Dec. 31, 1941	Smith, E. H.
Pheasants	4,639	Jan. , 1940	Jan. 2, 1942	Conkey & Co., John A.
Rabbits	3,422	Nov. 25, 1940	Feb. 25, 1942	Chamberlain & Co., Inc.
Butterfish	150	June 6, 1940	Sept. 5, 1941	Standard Fish Co.
Chubs	998	May 25, 1940	Sept. 5, 1941	Standard Fish Co.
Cod Cheeks	230	Mar. 1, 1940	July 1, 1941	Warren Fitch Co.
Smoked Cod	2,432	Dec. , 1939	*Oct. 1, 1941	Gorton-Pew Fisheries Co.
Smoked Cod	1,749	Jan. , 1940	Apr. 1, 1941	Gorton-Pew Fisheries Co.
Tom Cod (3 lots)	845	Nov. 16, 1940	Apr. 16, 1942	Brockelman Bros., Inc.
Tom Cod	310	Nov. 19, 1940	Apr. 16, 1942	Brockelman Bros., Inc.
Tom Cod	535	Nov. 21, 1940	Apr. 16, 1942	Brockelman Bros., Inc.
Tom Cod (2 lots)	623	Nov. 23, 1940	Apr. 16, 1942	Brockelman Bros., Inc.
Eels	17,250	Dec. 21, 1939	Jan. 7, 1941	Nagle Co., John
Flounders	1,037	Dec. 12, 1939	Jan. 31, 1941	Arrington, H. R.
Halibut (3 lots)	26,746	Sept. 30, 1940	Mar. 30, 1942	General Seafoods Corp.
Lobster Meat	185	Jan. 26, 1940	Mar. 26, 1941	Consolidated Lobster Co.
Mackerel	448	July 15, 1940	Sept. 1, 1941	American Fish Co.
Mackerel (2 lots)	4,500	Sept. 12, 1940	Dec. 12, 1941	Batchelder & Snyder Co.
Mackerel (13 lots)	30,284	Jun 6, 1940	Feb. 1, 1942	Gloucester Fresh Fish Co.
Mackerel	1,500	June 11, 1940	Feb. 1, 1942	Gloucester Fresh Fish Co.
Mackerel	2,300	June 14, 1942	Feb. 1, 1942	Gloucester Fresh Fish Co.
Mackerel (2 lots)	8,000	June 15, 1940	Feb. 1, 1942	Gloucester Fresh Fish Co.
Mackerel (6 lots)	15,184	June 18, 1940	Feb. 1, 1942	Gloucester Fresh Fish Co.
Mackerel	300	July 6, 1940	Feb. 1, 1942	Gloucester Fresh Fish Co.
Mackerel	900	July 16, 1940	Dec. 31, 1941	Gloucester Fresh Fish Co.
Mackerel	2,250	July 18, 1940	Dec. 31, 1941	Gloucester Fresh Fish Co.
Mackerel	1,350	July 19, 1940	Dec. 31, 1941	Gloucester Fresh Fish Co.
Mackerel	1,200	Aug. 17, 1940	Dec. 31, 1941	Gloucester Fresh Fish Co.
Mackerel	900	Aug. 27, 1940	Dec. 31, 1941	Gloucester Fresh Fish Co.
Mackerel	7,707	July 8, 1940	*Mar. 31, 1942	Henry & Close, Inc.
Mackerel	31,381	July 15, 1940	*Mar. 31, 1942	Henry & Close, Inc.
Mackerel	1,910	Sept. 12, 1940	Mar. 31, 1942	Phillips Co., B. F.
Mackerel	466	June 28, 1940	Sept. 5, 1941	Standard Fish Co.
Polpi	–	Mar. 16, 1940	June 16, 1941	Genoa Fisheries, Inc.
Polpi	7,450	Feb. 8, 1940	May 8, 1941	Russo & Sons Co.
Salmonettes	130	†Nov. 27, 1940	Nov. 27, 1941	Genoa Fisheries, Inc.
Salmonettes	250	May 27, 1940	Nov. 30, 1941	Mantia & Sons Co., John
Salmonettes	80	†Feb. 27, 1941	Feb. 28, 1942	Mantia & Sons Co., John
Salmonettes	80	Nov. 27, 1940	Dec. 27, 1941	Russo & Sons Co.
Sardines	768	Dec. 8, 1939	Feb. 28, 1941	Mantia Fish Corp.
Sardines (2 lots)	2,950	Dec. 9, 1939	Feb. 28, 1941	Mantia Fish Corp.
Sardines	4,300	Oct. 22, 1940	Dec. 22, 1941	Russo & Sons Co.
Scallops	744	Oct. 8, 1940	Dec. 8, 1941	Russo & Sons Co.
Shad	1,750	Sept. 25, 1940	Mar. 25, 1942	Hamilton Co., R. S.
Shad	1,715	June 10, 1940	Sept. 5, 1941	Standard Fish Co.
Shad (2 lots)	3,461	June 13, 1941	Sept. 5, 1941	Standard Fish Co.
Smelts	3,525	Mar. 7, 1940	June 15, 1941	General Seafoods Corp.
Smelts	7,050	Mar. 7, 1940	*Dec. 31, 1941	General Seafoods Corp.
Smelts	1,008	Mar. 11, 1940	June 15, 1941	General Seafoods Corp.
Smelts (2 lots)	10,218	Mar. 11, 1940	*Dec. 31, 1941	General Seafoods Corp.
Smelts	7,155	Mar. 14, 1940	June 15, 1941	General Seafoods Corp.
Smelts	800	Mar. 14, 1940	*Dec. 31, 1941	General Seafoods Corp.
Smelts	4,545	Mar. 15, 1940	June 15, 1941	General Seafoods Corp.
Smelts	1,780	Mar. 15, 1940	*Dec. 31, 1941	General Seafoods Corp.
Smelts	1,030	May 29, 1940	Nov. 29, 1941	General Seafoods Corp.
Smelts	–	Mar. 11, 1940	June 11, 1941	Genoa Fisheries, Inc.
Smelts	1,650	Mar. 14, 1940	May 14, 1941	Harding Co., F. E.
Smelts (2 lots)	51,690	May 27, 1940	*Mar. 27, 1942	Russo & Sons Co.

*The extension of time granted on this lot was amended before the expiration of the time to which extended. The length of time given includes the total amended period, and the weights given are the initial weights upon which extensions were asked.

†Previously frozen.

TABLE 11.— *Slaughtering Report from December 1, 1940, through November 30, 1941*

Total Number of Carcasses Inspected				156,720
Cattle	28,970	Hogs	49,454	
Calves	75,909	Sheep	2,387	
Total Number of Carcasses Condemned				2,192
Cattle	110	Hogs	403	
Calves	1,677	Sheep	2	

REASONS FOR CONFISCATION	Cattle	Calves	Hogs	Sheep	Totals
Immaturity	–	1,503	–	–	1,503
Cholera	–	–	279	–	279
Tuberculosis	8	3	18	–	29
Died other than by slaughter	8	115	5	1	129
Bruised or injured	28	7	6	–	41
Pneumonia	17	1	13	1	32
Scours	–	22	–	–	22
Anemia	–	3	–	–	3
Emaciation	11	4	6	–	21
Peritonitis	2	–	17	–	19
Septicemia	17	2	4	–	23
Hemorrhagic Septicemia	–	–	22	–	22
Fetus	–	12	–	–	12
Icterus	1	4	9	–	14
Tumor	1	–	2	–	3
Abscessed	1	–	10	–	11
Parturition	2	–	–	–	2
Mastitis	3	–	–	–	3
Milk Fever	1	–	1	–	2
Gangrene	2	–	–	–	2
Petechia	1	–	–	–	1
Exhaustion	–	–	1	–	1
Pericarditis	1	–	–	–	1
Lead Poisoning	1	–	–	–	1
Enteritis	–	1	5	–	6
Strangulation	2	–	–	–	2
Dropsy	1	–	–	–	1
Fever	1	–	2	–	3
Ruptured	–	–	1	–	1
Pleurisy	–	–	2	–	2
Empyemia	1	–	–	–	1
Totals	110	1,677	403	2	2,192

THE DIVISION OF GENITOINFECTIOUS DISEASES

N. A. Nelson, M.D., *Director*

Statistical Summaries

The trend of reporting during the past several years is indicated by the following figures:

Sources of Reports of Gonorrhea

Year	Total Cases	Physicians			Clinics		Institutions		Military	
		Number	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
1937	5,856	988	3,140	53.6	2,209	37.7	507	8.7	–	–
1938	4,938	883	2,272	46.0	2,266	45.9	400	8.1	–	–
1939	4,652	782	2,163	46.5	2,147	46.2	342	7.3	–	–
1940	4,014	786	1,815	45.2	1,894	47.2	305	7.6	–	–
1941	3,791	685	1,515	40.0	1,391	36.7	179	4.7	706	18.6

Sources of Reports of Syphilis

Year	Total Cases	Physicians			Clinics		Institutions		Military	
		Number	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
1937	6,207	961	2,103	33.9	2,788	44.9	1,316	21.2	–	–
1938	5,674	912	1,814	32.0	2,919	51.4	941	16.6	–	–
1939	4,888	839	1,576	32.3	2,528	51.7	784	16.0	–	–
1940	5,024	877	1,598	31.8	2,537	50.5	889	17.7	–	–
1941	4,613	882	1,635	35.5	2,253	48.8	628	13.6	97	2.1

There were 203 deaths from syphilis (including deaths from general paralysis and tabes dorsalis) at a rate of 6.2 per 100,000 population as compared with a rate of 7.9 last year and an average rate of 7.5 for the preceding five years.

Deaths from congenital syphilis numbered 7 in 1941. Only 15 cases of congenital syphilis under one year of age were reported during the year.

Provision of Treatment

The twenty-five cooperating clinics were paid a total of approximately $227,200 during the fiscal year, an increase of about $11,000 over the previous year. Patients and contacts made 185,705 visits, or nearly 38,200 fewer visits than during 1940. The cost per visit to the Commonwealth is approximately $1.23 as compared to 99 cents in 1940. This increase is due to the fact that expenses have remained constant or have increased and patients have paid less than in previous years. Patients paid approximately $30,850 as compared to $31,200 last year. The total cost of maintaining clinic service was, therefore, approximately $259,900, or $1.40 per visit. The cost of transportation provided patients was $1,800 less than in the year 1940.

Only 25,900 visits were made for the treatment of gonorrhea, as compared to 49,000 last year. This decline is unquestionably due to the effect of the sulfonamides on the disease, principally its rapid therapeutic effect. One hundred and fifty-nine thousand visits for the treatment of syphilis were made as compared to 174,000 last year.

Thirty-three hospitals requested reimbursement for the hospital care of patients with syphilis or gonorrhea, as compared to 38 last year. Hospital care was provided for 653 patients, as compared to 811 last year, at a total cost of $19,711.64, or almost $7,000 less than last year.

The twenty-five cooperating clinics admitted 1,363 new cases of gonorrhea and 2,112 new cases of syphilis, a decrease of 495 cases of gonorrhea and 226 cases of syphilis. The cooperating clinics treated 97 per cent of all gonorrhea treated in clinics in Massachusetts and 90 per cent of all syphilis so treated.

Follow-up by Boards of Health

During 1941, 957 cases were referred to 117 boards of health for follow-up.

Year	Cases	Per Cent Found	Number of Communities	No Report from Board of Health	
				Per Cent of Cases	Communities
1937	3,339	52.3	146	4.8	28
1938	2,020	57.4	131	7.5	34
1939	1,650	61.2	126	4.2	24
1940	1,046	66.7	97	3.0	14
1941	957	59.7	117	10.6	16

Follow-up Service for Private Physicians

One nurse has been engaged throughout the year in the follow-up of cases for private physicians in the Metropolitan Boston Area. Eighty-five (77 per cent) of the patients were successfully returned to treatment, 9 per cent were lost and 14 per cent still remain active. Of the contacts, 78 per cent were brought to medical attention. The nurse made 343 visits to patients and 99 visits to contacts.

Follow-up Service for Syphilis in Pregnancy

In 1941 the nurse followed 208 pregnant women in whom 148 pregnancies were terminated. Of the 145 babies, 104 have been examined, none of whom showed any evidence of congenital syphilis.

Other Diagnostic and Treatment Services

Arsenicals and Bismuth:

Free arsenicals and bismuth are supplied to all cooperating clinics and private physicians in the State who request this service.

Sulfathiazole:

Beginning in January, 1941, the Department has distributed sulfathiazole to cooperating clinics only, for the treatment of gonorrhea. The Department also plans to distribute this drug to private physicians for the treatment of gonococcal infections.

Laboratory:

The Wassermann Laboratory reports 400,265 blood and spinal fluid examinations, an increase of almost 70,000 over last year. The Bacteriological Laboratory reported 12,590 smears examined for gonorrhea, which is approximately the same as last year.

Education and Information

During the year the staff lectured to 47 professional and public groups, reaching 5,406 persons.

During the year 167,987 pieces of literature were distributed (163,380 in 1940). *The Bulletin of Genitoinfectious Diseases* was distributed for nine months of the year to every physician in the State and to a large mailing list outside this State.

Training of Personnel

The Harvard School of Public Health continued to offer a course of training for health officers in genitoinfectious disease control, and the Department has continued to cooperate with the Massachusetts Medical Society in the maintenance of a course of postgraduate instruction for physicians.

National Defense

The Department has cooperated with the Selective Service System by providing epidemiologic follow-up of selectees with positive or doubtful blood tests. The

following table shows the results of this investigation from December 1, 1940 through December 31, 1941:

	Positive	Doubtful	Total
1. Total selectees referred for follow-up	476	111	587
2. Total closed by epidemiologists	439	98	537
Infected	338	25	363
Already under treatment	97	13	110
Returned to treatment	48	6	54
No further treatment necessary	18	2	20
No previous treatment	175	4	179
Not infected	18	59	77
Inducted	17	11	28
Lost	17	2	19
Refuse to cooperate	2	1	3
Referred to Board of Health	16	–	16
Referred out-of-state	31	–	31
3. Cases still active with epidemiologists	37	13	50

The most important relation of the Department to the war effort has been the cooperative program carried on by the Department and the Army and Navy, which provides for the epidemiologic investigation of sources of infection and contacts of infected soldiers and sailors. Department nurses are allowed to enter directly into the camps, the Chelsea Naval Hospital and the U. S. Marine Hospital to interview infected men. The following table shows the results of this investigation from December 1, 1940 through December 31, 1941:

1. Total men interviewed			980
2. Total contacts involved			1,092
(a) Not referred (insufficient information)		400	
(b) Referred, follow-up closed		481	
(1) Followed by nurse	153		
Success	130		
Failure	23		
(2) Followed by police	113		
Success	38		
Failure	66		
No reply	9		
(3) Followed out-of-state	208		
Success	49		
Failure	83		
No reply	76		
(4) Followed by other agency	7		
No reply	7		
(c) Referred, follow-up pending		211	

This program has provided an example of cooperative effort between a civilian health agency and the armed forces which should lead to successful control of the genitoinfections in the Army and Navy in Massachusetts. With the declaration of war on December 8, 1941, the Department found itself already providing important services to the Army and Navy in this area.

THE DIVISION OF SANITARY ENGINEERING

ARTHUR D. WESTON, *Chief Sanitary Engineer*

FOREWORD

The activities of this division have been presented in tabular form for the year 1941.

In connection with the use of the tables on water consumption, it should be remembered that the per capita water consumption shown is determined by the population of the municipality in which the works are located and not necessarily on the number of persons served. Under these conditions the per capita water consumption in some cities and towns where only a small percentage of the population is served shows a smaller per capita water consumption than is actually the case. In addition, it should also be stated that the average daily and per capita water consumption as shown are not a true indication of the maximum demands in those municipalities where the bulk of the consumption is during the summer months.

The table of chemical analyses of water of public water supplies shows the average results of the total number of samples received from each source during the year. The total number of analyses to obtain this average is shown in the last column. In instances where the water has been found to be uniform in quality only 1, 2 or 3 samples are collected throughout the year; more frequent sampling is unnecessary.

The tables referring to rainfall represent the rainfall as determined by this Department at seven long term rainfall stations well distributed throughout the State. The rainfall for certain sections of the State may vary considerably from that indicated by this average.

The tables relative to yield of drainage areas and tables relative to sewage treatment works are presented in order that there may be a continuity of records.

Average Daily Consumption of Water in Various Cities and Towns in 1941

City or Town	Population	Gallons	Gallons per Inhabitant
Metropolitan Water District			
Arlington	40,308	2,278,500	57
Belmont	27,274	1,626,200	60
Boston	770,816	97,767,600	127
Chelsea	41,259	3,554,800	86
Everett	46,784	5,762,300	123
Lexington	13,662	749,700	55
Malden	58,157	4,378,500	75
Medford	63,411	3,630,300	57
Melrose	25,548	1,464,500	57
Milton	18,820	1,039,600	55
Nahant	1,852	252,400	136
Quincy	75,810	5,076,000	67
Revere	34,405	1,924,500	56
Somerville	102,458	9,913,000	97
Stoneham	10,765	657,600	61
Swampscott	10,817	822,100	76
Watertown	35,427	3,003,500	85
Winthrop	16,768	1,401,900	84
Abington and Rockland	13,837	774,000	56
Acton	2,714	132,000	49
Acushnet	4,184	130,000	31
Adams	12,608	1,333,000	106
Agawam	7,969	426,000	53
Amesbury	10,932	789,300	72
Amherst	6,410	628,600	98
Andover	11,238	1,340,500	119
Ashburnham	2,296	91,700	40
Ashland	2,479	641,000	259
Athol	11,266	581,900	52
Attleboro	22,118	1,303,534	59
Avon	2,335	147,000	63
Ayer	3,572	267,100	75
Barnstable	8,392	769,000	92
Barre	3,532	67,200	19
Bedford	3,931	181,200	46
Belchertown	3,503	33,400	10
Bellingham	2,979	83,000	28
Beverly	25,537	1,787,900	70
Billerica	8,190	350,500	43
Blandford	481	16,800	35
Bourne	3,315	148,000	45
Braintree	16,378	1,344,000	82
Bridgewater	8,902	235,800	26
Brockton	62,343	3,011,000	48
Brookfield	1,410	41,000	29
Brookline	49,786	5,032,200	101
Cambridge	110,879	13,750,000	124
Canton	6,381	717,000	112
Chatham	2,153	114,000	53
Chelmsford	8,173	350,900	43
Chicopee	41,664	3,483,300	84
Clinton	12,453	996,400	80
Cohasset	3,111	336,000	108
Concord	8,022	518,000	65
Danvers and Middleton	16,661	1,013,100	61
Dalton	4,206	1,400,000	333
Dartmouth	9,011	261,000	29
Deerfield	2,684	42,900	16
Dedham	15,535	1,135,000	73
Douglas	2,660	280,600	105
Dracut	7,507	269,000	36
Dunstable	453	2,835	6
Duxbury	2,382	302,000	127
East Bridgewater	3,864	217,000	56
East Brookfield	1,030	36,400	35
Easthampton	10,316	964,100	93
East Longmeadow	3,409	114,500	34
Easton	5,135	297,000	58

Average Daily Consumption of Water in Various Cities and Towns in 1941 — Concluded

City or Town	Population	Gallons	Gallons per Inhabitant
Edgartown	1,370	165,500	121
Fairhaven	10,938	490,000	45
Fall River	115,428	7,505,500	65
Falmouth	6,946	917,885	132
Fitchburg	41,849	5,474,300	131
Foxborough	6,397	631,000	99
Framingham	23,327	1,568,000	67
Franklin	7,303	465,000	64
Gardner	20,206	1,086,700	54
Georgetown	1,803	49,900	28
Gloucester	24,046	1,928,100	80
Grafton	7,457	112,000	15
Great Barrington	5,824	445,500	76
Greenfield	15,672	1,511,600	96
Groton	2,553	445,000	174
Groveland	0,000	00,000	00
Hamilton	2,037	65,600	32
Hanover	2,908	211,000	73
Hanson and Pembroke	4,338	144,700	33
Harwich	2,567	62,000	24
Haverhill	46,752	4,246,300	91
Hingham and Hull	10,214	1,169,100	114
Holden	3,926	81,900	21
Holliston	3,015	112,000	37
Holyoke	53,750	7,531,400	140
Hudson	8,042	456,500	57
Ipswich	6,374	330,100	52
Kingston	2,791	253,000	91
Lancaster	3,038	150,900	50
Lanesborough	1,338	31,300	23
Lawrence	84,323	4,363,700	52
Leicester	4,936	189,600	38
Leominster	22,292	3,202,000	144
Lincoln	1,825	331,500	182
Littleton	1,675	106,100	63
Longmeadow	5,927	421,000	71
Lowell	101,644	5,686,100	56
Ludlow	8,181	332,400	41
Lunenburg	2,209	81,900	37
Lynn	98,123	8,773,800	89
Lynnfield	2,365	74,500	32
Manchester	2,472	371,300	150
Mansfield	6,530	635,000	97
Marblehead	10,993	853,900	78
Marion	2,063	200,000	97
Marlborough	15,154	851,300	56
Marshfield	2,488	377,000	151
Mattapoisett	1,608	100,000	62
Maynard	6,812	328,000	48
Medfield	4,428	82,000	19
Medway	3,303	260,000	79
Merrimac	2,342	207,300	89
Methuen	22,041	1,081,800	49
Middleborough	9,065	339,000	37
Milford and Hopedale	18,586	922,000	50
Millbury	7,004	370,000	53
Millis	2,314	192,000	83
Montague and Erving	8,910	912,800	102
Nantucket	3,401	466,290	137
Natick	13,851	955,700	69
Needham	12,568	769,000	61
New Bedford	110,405	10,053,200	91
Newburyport	13,916	1,521,800	109
Newton	70,619	5,363,200	76
North Adams	22,239	2,912,300	131
North Andover	7,596	513,200	68
North Attleborough	10,390	904,000	87
Northborough	2,382	100,600	42
Northbridge	10,242	772.000	75
Northampton	24,848	3,206,900	129
North Brookfield	3,328	438,100	131
North Reading	2,999	52,500	18
Norton	3,143	219,000	70
Norwood	15,383	1,090,700	71
Oak Bluffs	1,584	122,000	77
Oxford	4,698	150,000	32
Palmer	9,149	348,300	38
Paxton	803	17,400	22
Peabody	21,711	2,825,000	130
Pepperell	3,136	315,300	100
Pittsfield	50,118	6,991,200	139
Plainville	1,302	101,416	78
Plymouth	13,300	1,417,000	107
Provincetown	3,668	363,000	99
Randolph and Holbrook	10,968	669,700	61
Reading	10,899	672,100	62
Rockport	3,556	373,300	105
Russell	1,242	40,700	33
Salem	41,213	4,461,600	108
Salisbury	2,402	306,300	128
Saugus	14,825	785,000	53
Scituate	4,187	522,000	125
Sharon	3,748	420,600	112
Shelburne	1,642	97,300	59
Shirley	2,620	90,900	35
Shrewsbury	7,674	405,700	53
Somerset	5,916	288,000	49
Southbridge	17,033	919,000	54
Southwick	1,587	38,300	24
Springfield	149,554	17,200,000	115
Sterling	1,744	23,300	13
Stoughton	8,663	691,300	80
Sturbridge	2,289	95,600	42
Sudbury	1,777	21,000	12
Taunton	37,395	2,823,000	75
Tisbury	1,995	246,000	123
Townsend	2,090	155,400	74
Uxbridge	6,421	352,800	55
Wakefield	16,223	839,500	52
Walpole	7,443	1,010,000	136
Waltham	40,020	2,798,000	70
Ware	7,557	372,000	49
Wareham	6,427	281,000	44
Warren	3,531	102,000	29
Wayland	3,537	388,600	110
Webster	13,186	680,240	52
Wellesley	15,477	1,444,000	93
West Bridgewater	3,247	199,400	61
West Brookfield	1,413	99,500	70
Westfield	18,794	2,099,100	112
Westford	3,838	131,200	34
Weston	3,590	242,000	67
West Newbury	1,523	19,300	13
West Springfield	17,138	2,033,900	119
Weymouth	24,292	1,432,000	59
Whitman	7,793	328,000	42
Wilbraham	3,055	64,100	21
Williamsburg	1,684	87,700	52
Wilmington	4,675	272,800	58
Winchendon	6,575	263,200	40
Winchester	15,423	1,109,000	72
Woburn	19,762	1,757,100	89
Worcester	194,339	19,482,000	100
Wrentham	4,777	209,000	44
Yarmouth	2,324	97,000	42

City or Town	Source	(Parts per Million)										
		Color	Residue on Evaporation	Ammonia: Free	Ammonia: Total Albuminoid	Nitrogen as Nitrates	Chlorides	Hardness	Alkalinity	Fe	pH	No. of Samples
Metropolitan Water District	Wachusett Reservoir, upper end	20	38	.023	.114	.09	2.2	18	13	.12	6.6	6
	Wachusett Reservoir, lower end	9	35	.008	.079	.09	2.4	15	12	.04	6.7	6
	Sudbury Reservoir	12	37	.018	.104	.07	2.7	17	12	.06	6.7	6
	Framingham Reservoir No. 3	11	40	.017	.093	.08	3.1	19	13	.11	6.7	6
	Ware River at Coldbrook intake	36	65	.074	.188	.08	2.4	15	18	.34	6.7	4
	Hopkinton Reservoir	40	39	.023	.161	.08	3.2	13	11	.17	6.3	6
	Ashland Reservoir	46	44	.025	.139	.08	4.3	13	11	.14	6.4	6
	Framingham Reservoir No. 2	33	135	.102	.152	.09	34.8	29	4	.70	4.7	6
	Lake Cochituate	13	69	.024	.138	.21	7.5	29	19	.12	6.9	6
	Chestnut Hill Reservoir	13	41	.130	.125	.08	3.9	20	13	.09	6.7	6
	Weston Reservoir	11	36	.034	.097	.11	3.0	17	12	.09	6.6	6
	Spot Pond	12	37	.099	.105	.09	3.8	17	12	.11	6.6	6
	Tap in State House	13	37	.140	.105	.15	3.8	18	12	.10	6.7	2
	Tap in Revere	11	39	.021	.081	.13	3.9	18	13	.19	6.7	6
	Tap in Quincy	10	39	.013	.064	.20	4.1	20	14	.14	6.7	6
Abington	Big Sandy Pond	5	41	.012	.120	.06	8.4	13	12	.08	6.7	4
Acushnet (Fire and Water District)	New Bedford Water Supply											
Adams (Fire District)	Bassett Brook Reservoir	3	57	.007	.055	.18	1.5	38	39	.05	7.1	4
Agawam	Springfield Water Supply: (Cobble Mountain Supply)											
Amherst (Water C)	Atkins Pond	12	29	.069	.218	.07	1.5	9	7	.19	6.1	4
	Amethyst Brook-Intake Reservoir	25	36	.023	.070	.11	1.7	11	10	.07	6.5	4
Andover	Haggett's Pond	12	50	.022	.138	.32	.52	24	15	.04	6.7	4
Arlington	Metropolitan Water Supply											
Ashburnham	Upper Naukeag Lake	7	22	.010	.053	.07	2.0	4	6	.10	5.5	4
Ashfield (Water Co.)	Highland Spring Reservoir	19	48	.011	.096	.08	1.2	29	28	.15	6.9	3
Athol	Buckman Brook Reservoir (Newton Reservoir)	16	32	.022	.147	.08	1.6	11	8	.14	6.0	6
	Thousand Acre Meadow Brook	117	55	.040	.240	.07	1.8	18	10	.16	5.5	6
	Phillipston Reservoir	41	39	.035	.205	.11	3.5	15	10	.19	6.3	6
	Raw water at filter plant	27	35	.025	.157	.10	2.4	13	9	.22	5.9	6
	Final effluent	1	62	.012	.044	.08	2.5	24	27	.03	7.9	6
Barre	Reservoir	8	39	.046	.169	.08	2.9	18	11	.11	6.5	4
Belmont	Metropolitan Water Supply											
Beverly	Joint supply with Salem											
Blackstone	Woonsocket Supply											
Blandford (Fire District)	Freeland Brook	3	33	.007	.019	.27	2.1	16	14	.04	6.8	3
Boston	Metropolitan Water Supply											
Braintree	Great Pond (raw water)	26	60	.038	.213	.30	9.0	20	12	.16	6.7	6
	Great Pond, filtered	4	69	.033	.093	.25	9.0	27	18	.04	7.3	6
Brockton	Silver Lake	7	33	.013	.087	.08	6.1	8	10	.05	6.6	4

Brookfield	Cooley Hill Reservoir	10	36	.016	.060	.10	2.2	16	9	.20	5.9	1
Cambridge	Upper Hobbs Brook Reservoir	15	64	.066	.208	.15	5.6	27	16	.14	6.7	4
	Lower Hobbs Brook Reservoir	15	61	.028	.188	.11	5.6	26	17	.05	6.9	4
	Stony Brook Reservoir	29	69	.032	.163	.34	6.5	33	21	.13	6.9	4
	Fresh Pond	11	83	.056	.160	.36	8.4	40	25	.06	7.1	5
	Filter effluent	3	86	.023	.064	.35	7.4	44	24	.06	8.0	5
Chelsea	Metropolitan Water Supply											
Cheshire (Water Co.)	Kitchen Brook Reservoir	2	58	.013	.025	.18	1.2	39	40	.05	7.2	2
Chester	Austin Brook Reservoir	10	38	.003	.044	.09	1.3	21	15	.04	6.7	2
	Horn Pond	12	38	.011	.131	.09	1.1	22	17	.05	6.8	2
Chicopee	Cooley Brook Reservoir, raw water	23	51	.051	.091	.92	6.1	21	18	.17	6.7	6
	Cooley Brook Reservoir, filtered	1	67	.085	.027	.77	2.8	34	22	.04	7.9	6
	Morton Brook	7	62	.008	.020	.23	3.3	24	15	.22	6.7	6
Clinton	Lower Lynde's Reservoir	11	31	.030	.126	.14	1.7	13	11	.13	6.5	4
	Heywood Pond	14	26	.026	.119	.08	1.7	13	8	.14	6.1	4
	Spring Basin	10	58	.030	.113	.16	2.9	24	22	.08	6.8	4
Colrain (Griswoldville)	McClellan Brook Reservoir	5	74	.006	.036	.05	1.5	52	48	.07	7.0	2
Colrain (Fire District No. 1)	Mountain Brook Reservoir	7	80	.002	.016	.06	2.1	64	60	.09	7.3	2
Concord	Nagog Pond	7	33	.012	.108	.08	3.9	9	9	.05	6.4	4
Dalton (Fire District)	Egypt Brook Reservoir	17	34	.007	.067	.07	1.1	15	11	.10	6.6	4
	Raw water	21	41	.007	.070	.08	1.1	20	17	.10	6.8	4
	Filtered water	22	52	.003	.047	.07	1.0	29	30	.05	7.7	3
	Windsor Reservoir	22	60	.007	.075	.07	1.1	31	31	.10	6.9	4
Danvers	Middleton Pond	39	44	.031	.188	.09	4.0	18	11	.19	6.5	6
Dartmouth	New Bedford Water Supply											
Deerfield (South Deerfield Water Supply District)	Roaring Brook Reservoir	14	67	.005	.061	.11	1.6	45	40	.42	7.2	3
East Bridgewater	Brockton Water Supply											
East Longmeadow	Springfield Water Supply (Cobble Mountain Supply)											
Egremont (South Egremont Water Company)	Goodale Brook Reservoir	2	49	.010	.022	.09	1.3	32	31	.05	7.2	2
Erving (Millers Falls Fire and Water District)	Montague (Turners Falls Fire District) Water Supply											
Everett	Metropolitan Water Supply											
Fall River	North Watuppa Lake	9	32	.014	.114	.07	5.7	9	6	.07	5.6	5
Falmouth	Long Pond, before lime treatment	4	35	.010	.080	.08	9.7	6	8	.04	6.5	4
	Long Pond, treated	4	36	.062	.072	.08	9.7	11	11	.04	8.3	4
Fitchburg	Ashby Reservoir	22	30	.044	.139	.07	1.7	10	7	.37	5.6	5
	Scott Reservoir	8	31	.065	.195	.08	1.7	8	8	.15	6.1	3
	Meetinghouse Pond	5	30	.045	.119	.07	2.2	14	9	.05	6.3	4
	Wachusett Lake	9	25	.027	.094	.08	2.0	9	9	.16	6.2	4
	Falulah Brook	21	28	.016	.100	.09	1.7	8	6	.20	5.6	4
	Lovell Reservoir	10	30	.034	.117	.08	1.9	6	6	.12	5.7	4
Gardner	Crystal Lake	11	42	.017	.132	.08	2.2	23	16	.07	6.9	4
Gloucester	Haskell Reservoir	12	38	.012	.081	.07	8.5	7	5	.21	5.4	4
	Dike's Brook Reservoir	27	41	.020	.116	.07	9.6	7	6	.59	5.4	5
	Wallace Reservoir	14	43	.030	.143	.07	10.6	7	7	.24	5.7	5
	Babson Reservoir	31	58	.023	.132	.09	12.2	14	7	.32	5.7	4
Great Barrington (Housatonic Water Works Company)	Long Pond, raw water	6	84	.015	.157	.08	1.2	75	64	.07	7.5	6
	Filtered Water	2	90	.004	.078	.10	1.3	80	69	.04	7.3	6

Averages of Chemical Analyses of Surface-Water Sources, etc.— Continued

City or Town	Source	(Parts per Million) Color	Residue on Evaporation	Ammonia: Free	Ammonia: Total Albuminoid	Nitrogen as Nitrates	Chlorides	Hardness	Alkalinity	Fe	pH	No. of Samples
Great Barrington (Fire District)	East Mountain Reservoir	5	53	.035	.068	.09	1.3	43	40	.05	7.3	4
Greenfield	Filter Plant, raw water	4	61	.010	.026	.14	1.5	40	38	.05	7.1	6
	Filter Plant, outlet of filter	1	62	.005	.012	.11	1.5	40	37	.03	7.2	6
Groveland	Haverhill Water Supply (Johnson's Pond)											
Hadley (Water Supply District)	Hart's Brook Reservoir	8	51	.010	.064	.14	1.8	21	21	.14	7.0	3
Hanson	Brockton Water Supply											
Hatfield	Running Gutter Brook Reservoir	6	71	.004	.023	2.7	1.7	35	26	.11	7.2	3
Haverhill	Millvale Reservoir	38	57	.048	.203	.11	3.9	23	20	.16	6.7	5
	Johnson's Pond	12	58	.050	.152	.09	4.2	27	26	.08	6.9	5
	Crystal Lake	13	36	.037	.119	.08	3.7	16	14	.05	6.6	5
	Pentucket Lake	12	43	.031	.177	.09	4.0	21	18	.17	6.8	5
	Kenoza Lake	17	51	.022	.145	.09	4.2	23	20	.08	6.8	5
Hingham (Water Co.)	Accord Pond	16	34	.011	.111	.09	6.5	9	8	.12	6.2	6
Hinsdale (Fire District)	Reservoir	6	20	.002	.029	.09	1.1	7	7	.12	5.5	3
Holbrook	Joint supply with Randolph											
Holden	Rutland Water Supply											
Holyoke	Hugh McLean Reservoir	9	37	.017	.099	.08	1.4	19	16	.14	6.8	6
	Carmody Reservoir	18	38	.022	.099	.07	1.6	14	13	.11	6.6	6
	Wright and Ashley ponds	11	44	.006	.097	.06	1.4	21	21	.07	7.0	6
	White Reservoir	15	38	.023	.129	.07	1.4	21	17	.20	6.7	6
	Whiting Street Reservoir	5	48	.027	.118	.07	1.6	25	25	.09	7.0	6
Hopedale	Milford Water Supply											
Hudson	Gates Pond	6	31	.013	.128	.07	2.8	13	11	.11	6.6	4
Hull	Hingham Water Supply											
Huntington (Fire District)	Cold Brook Reservoir	9	40	.002	.026	.10	1.8	20	17	.10	6.4	5
Ipswich	Dow's Brook Reservoir	18	57	.032	.165	.09	7.3	23	20	.07	6.9	4
	Bull Brook Reservoir	77	75	.028	.202	.12	7.9	31	27	.17	6.7	4
Lancaster	Clinton Water Supply											
Lawrence	Merrimack River	37	70	.211	.284	.097	5.1	26	10	.37	6.6	10
	Merrimack River, filtered	10	81	.169	.113	.141	6.7	34	14	.14	7.1	10
Lee (Berkshire Water Co.)	Codding Brook Upper Reservoir	9	39	.002	.031	.09	1.1	20	19	.05	7.0	4
	Codding Brook Lower Reservoir	9	38	.006	.030	.09	1.1	18	19	.07	7.0	4
	Basin Pond Brook	41	48	.011	.104	.09	1.3	24	19	.06	6.8	4
Lenox (Water Co.)	Lower Root Reservoir	5	82	.012	.031	.09	1.3	77	71	.13	7.3	4
	Woolsey Reservoir	1	81	.008	.020	.05	1.4	45	44	.04	7.2	4
Leominster	Fall Brook Reservoir	7	24	.025	.105	.07	1.8	6	7	.10	6.0	5
	Haynes Reservoir	15	23	.054	.167	.07	1.7	8	8	.22	6.1	5
	Morse Reservoir	8	23	.035	.113	.06	1.7	6	7	.09	6.0	5
	No-Town Reservoir	19	24	.029	.133	.08	1.7	5	7	.17	5.3	5
	No-Town Reservoir and Simonds Pond, filtered	4	45	.017	.045	.10	1.8	27	17	.07	9.1	5

Lexington	Metropolitan Water Supply												
Lincoln	Sandy Pond	7	31	.043	.139	.09	4.7	14	7	.36	6.4	3	
Longmeadow	Springfield Water Supply (Cobble Mountain Supply)												
Ludlow	Springfield Water Supply (Ludlow Reservoir Supply)												
Lunenburg	Leominster Water Supply												
Lynn	Breeds Pond	35	69	.033	.174	.12	8.8	31	17	.17	6.8	4	
	Birch Pond	12	52	.022	.154	.12	8.7	24	16	.11	6.8	4	
	Hawkes Pond	48	82	.023	.300	.12	8.4	34	33	.28	6.9	4	
	Walden Pond	56	85	.020	.244	.09	9.3	36	27	.46	6.8	4	
Lynnfield (Water District)	Lynn Water Supply												
Malden	Metropolitan Water Supply												
Manchester	Gravel Pond	10	46	.007	.094	.06	8.6	11	13	.09	6.8	4	
Marlborough	Lake Williams	5	67	.045	.147	.09	7.9	31	24	.05	7.0	4	
	Millham Brook Reservoir	49	64	.037	.153	.35	4.9	27	20	.17	6.8	3	
Maynard	White Pond	3	26	.016	.079	.06	2.5	8	9	.06	6.6	4	
Medford	Metropolitan Water Supply												
Melrose	Metropolitan Water Supply												
Middleton	Joint supply with Danvers												
Milford (Water Co.)	Charles River, inlet to filters	30	40	.013	.139	.11	3.4	13	9	.19	6.2	4	
	Dug wells and Charles River, filtered	17	51	.029	.043	.13	3.8	30	23	.18	7.6	4	
Milton	Metropolitan Water Supply												
Monroe (Water District)	Phelps Brook Reservoir, raw water	9	36	.009	.034	.12	1.3	19	11	.08	6.6	3	
	Phelps Brook Reservoir, filtered	8	43	.004	.034	.14	2.3	20	14	.07	6.9	5	
Montague (Turners Falls Fire District)	Lake Pleasant	5	34	.036	.159	.07	1.8	10	10	.32	6.5	3	
Monterey (Water Co.)	Reservoir	4	91	.002	.013	.06	1.7	85	77	.04	7.2	3	
Nahant	Metropolitan Water Supply												
New Bedford	Great Quittacas Pond	29	37	.018	.128	.08	5.6	11	9	.09	6.2	5	
	Little Quittacas Pond	22	37	.016	.142	.07	5.4	10	9	.13	6.4	5	
Newburyport	Artichoke River	27	57	.187	.345	.08	4.8	25	22	.23	–	4	
	Mixed raw water	18	71	.022	.210	.12	5.9	27	25	.64	6.8	4	
	Ground and reservoir water, filtered	9	62	.007	.100	.39	6.2	29	24	.04	6.5	4	
North Adams	Broad Brook	8	49	.009	.038	.11	1.2	33	29	.04	7.0	5	
	Notch Brook Reservoir	5	80	.120	.071	.17	1.1	71	61	.10	7.5	5	
	Mount Williams Reservoir	3	72	.011	.066	.07	1.3	56	55	.04	7.5	5	
Northampton	Middle Reservoir (Roberts Meadow Brook)	21	45	.012	.087	.07	1.5	25	21	.17	6.9	5	
	Mountain Street Reservoir	8	41	.009	.042	.06	1.3	23	19	.05	6.9	5	
North Andover	Great Pond	14	52	.043	.181	.06	5.0	21	13	.09	6.6	4	
Northborough	Lower Reservoir (Cold Harbor Brook)												
	Raw water	34	47	.033	.194	.10	3.1	18	13	.23	6.5	4	
	Final effluent	4	67	.003	.054	.08	2.9	16	24	.06	7.1	4	
North Brookfield	Doane Pond	32	37	.068	.245	.08	1.7	11	10	.68	6.3	5	
	North Pond	21	31	.027	.255	.08	1.7	11	9	.26	6.3	4	
Northfield (Water Co.)	Minot Brook Reservoir	12	37	.005	.029	.09	1.3	17	15	.07	6.7	2	
Northfield (Northfield Schools, Inc.)	Upper Reservoir on Louisiana Brook	18	38	.038	.083	.07	1.5	17	15	.39	6.8	2	
	Lower Reservoir on Louisiana Brook	17	37	.024	.045	.07	1.5	20	16	.36	6.8	2	
Norwood	Buckmaster Pond, raw water	11	69	.061	.139	.53	7.8	27	16	.23	6.7	4	
	Buckmaster Pond, filtered	6	76	.010	.070	.54	8.7	25	16	.09	6.5	4	
Orange	Coolidge Brook Reservoir	20	33	.017	.049	.10	1.5	9	11	.07	6.5	3	

Averages of Chemical Analyses of Surface-Water Sources, etc.— Concluded

City or Town	Source	(Parts per Million) Color	Residue on Evaporation	Ammonia: Free	Ammonia: Total Albuminoid	Nitrogen as Nitrates	Chlorides	Hardness	Alkalinity	Fe	pH	No. of Samples
Palmer (Fire District No. 1)	Graves Brook, Lower Reservoir	8	34	.012	.078	.06	1.6	16	15	.23	6.7	4
(Thorndike)	Hamilton Reservoir	8	39	.005	.034	.06	2.2	16	19	.08	6.5	3
Peabody	Spring Pond	12	65	.035	.138	.08	10.3	26	17	.12	6.8	6
	Suntaug Lake	22	66	.059	.172	.10	11.6	25	15	.14	6.7	6
Pembroke	Brockton Water Supply											
Pittsfield	Sackett Reservoir	11	67	.009	.035	.09	1.2	63	49	.04	7.1	5
	Hathaway Brook Reservoir	3	94	.008	.022	.14	1.4	93	78	.06	7.4	5
	Ashley Reservoir	15	58	.012	.074	.07	1.2	41	37	.05	7.3	5
	Ashley Lake	11	35	.016	.097	.07	1.2	18	16	.09	6.9	5
	Farnham Reservoir	46	39	.050	.171	.15	1.2	16	10	.43	6.4	5
	Mill Brook Reservoir	43	42	.034	.162	.12	1.4	17	14	.31	6.6	5
Pittsfield	Sand Wash Brook	87	47	.055	.235	.12	1.2	20	9	.66	5.7	5
Plainville	North Attleborough Water Supply											
Plymouth	Little South Pond	4	31	.021	.128	.07	7.1	7	7	.04	6.2	3
	Great South Pond	4	27	.030	.093	.07	6.8	5	8	.04	6.4	3
Quincy	Metropolitan Water Supply											
Randolph	Great Pond, raw water	26	58	.024	.182	.31	8.6	21	13	.20	6.6	6
	Filtered water	9	69	.014	.094	.36	8.9	21	14	.09	6.4	6
Revere	Metropolitan Water Supply											
Rockland	Joint Supply with Abington											
Rockport	Cape Pond, raw water	33	92	.044	.237	.08	20.8	20	8	1.03	5.4	5
	Filtered water	5	114	.042	.091	.10	22.4	34	15	.06	7.9	5
Russell	Black Brook Reservoir	14	32	.015	.055	.09	1.3	13	14	.08	6.7	3
	Black Brook Reservoir, filtered	14	31	.005	.038	.11	1.3	13	10	.22	6.5	3
Rutland	Muschopauge Lake	8	33	.029	.121	.08	4.1	18	11	.06	6.6	3
Salem	Ipswich River at Pumping Station	42	113	.059	.142	.64	9.2	57	45	.35	—	4
	Longham Reservoir	85	70	.057	.322	.22	10.2	24	15	.80	6.3	4
	Wenham Lake	27	62	.056	.166	.16	9.2	31	24	.28	6.8	4
	Wenham Lake, filtered	3	71	.083	.086	.16	9.3	32	14	.05	6.3	4
Saugus	Lynn Water Supply											
Shelburne (Shelburne Falls Fire District)	Fox Brook Reservoir	5	66	.010	.029	.26	1.4	40	39	.16	7.2	3
Somerville	Metropolitan Water Supply											
Southborough	Sudbury Reservoir	8	33	.005	.064	.06	2.7	19	12	.06	6.7	2
Southbridge	Hatchet Brook Reservoir No. 3	10	29	.010	1.03	.07	2.0	11	9	.14	6.3	4
	Hatchet Brook Reservoir No. 4	15	30	.011	.128	.07	1.9	10	10	.24	6.3	4
	Hatchet Brook Reservoir No. 5	19	28	.041	.099	.08	2.0	8	8	.14	5.9	4
South Hadley (South Hadley Falls Fire District No. 1)	Buttery Brook Reservoir	10	47	.062	.114	.35	3.9	21	14	.46	6.7	4
	Leaping Well Reservoir	7	32	.030	.090	.05	1.6	13	13	.13	6.8	4

South Hadley (Fire District No. 2)	Elmer Brook, raw water	5	73	.015	.046	.19	2.1	42	34	.05	7.1	3
	Filtered water	2	69	.009	.016	.20	2.3	40	33	.05	7.0	3
Southwick	Springfield Water Supply (Cobble Mountain Supply)											
Spencer	Shaw Pond	7	23	.012	.088	.08	2.5	10	9	.12	6.4	4
Springfield	Cobble Mountain Reservoir	15	33	.022	.094	.08	1.2	16	10	.17	6.5	5
	Cobble Mountain Reservoir, filtered	8	28	.002	.041	.09	1.3	11	11	.04	6.3	5
	Ludlow Reservoir, unfiltered	13	33	.022	.114	.06	1.7	15	17	.08	6.6	4
	Ludlow Reservoir, filtered	9	35	.003	.075	.07	1.6	14	12	.07	6.7	3
Stockbridge (Water Co.)	Lake Averic	6	70	.009	.041	.05	1.3	52	51	.09	7.5	3
Stoneham	Metropolitan Water Supply											
Stoughton	Muddy Pond	4	47	.011	.019	.13	3.7	21	21	6.8	.06	3
Sunderland (Water Co.)	Saw Mill Brook Reservoir	2	69	.003	.009	.11	1.6	42	43	.04	7.3	3
Swampscott	Metropolitan Water Supply											
Taunton	Assawompsett Pond	23	31	.024	.146	.09	5.1	9	7	.14	6.2	5
	Elder's Pond	10	33	.020	.130	.11	5.4	7	7	.05	6.3	5
Wakefield	Crystal Lake	9	72	.033	.160	.37	8.2	30	24	.09	6.9	4
	Crystal Lake, filtered	9	69	.006	.077	.42	8.7	32	25	.08	6.8	4
Wareham (Onset Fire District)	Jonathan Pond	1	29	.021	.149	.08	5.9	3	7	.05	6.2	4
Watertown	Metropolitan Water Supply											
West Bridgewater	Brockton Water Supply.											
Westfield	Montgomery Reservoir	32	33	.033	.123	.09	1.4	10	9	.14	6.4	5
	Winchell Reservoir	7	30	.017	.049	.07	1.4	10	12	.07	6.7	5
	Granville Reservoir	7	26	.024	.090	.07	1.4	8	10	.12	6.5	5
Westhampton (Water Co.)	Reservoir	7	44	.006	.030	.07	1.5	21	22	.11	6.9	3
West Newbury	Tap in Town, Groveland Supply	15	62	.010	.098	.10	5.6	28	25	.15	6.7	2
West Springfield	Bear Hole Brook Reservoir	10	76	.016	.054	.07	1.6	52	46	.18	7.2	4
	Bear Hole Brook Reservoir, filtered	4	75	.002	.022	.09	1.7	53	47	.04	7.1	4
West Stockbridge (East Mountain Water Co.)	East Mountain Reservoir	3	61	.002	.019	.15	1.6	37	31	.04	7.2	2
Weymouth	Great Pond	27	43	.007	.125	.09	6.1	10	6	.22	5.5	6
	Great Pond, filtered	6	62	.006	.062	.08	6.4	10	32	.09	7.8	6
Whitman	Brockton Water Supply.											
Wilbraham	Springfield Water Supply (Ludlow Reservoir Supply)											
Williamsburg	Unquomonk Brook Reservoir	11	40	.007	.069	.08	1.3	24	18	.16	6.9	3
Williamstown (Water Co.)	Paul Brook	2	63	.009	.015	.09	1.1	41	42	.06	7.6	3
	Rattlesnake Brook Reservoir	4	86	.003	.017	.07	1.1	78	72	.05	7.6	3
Winchester	North Reservoir	7	42	.017	.121	.08	4.6	22	12	.08	6.7	8
	Middle Reservoir	12	36	.039	.181	.08	4.6	19	9	.19	6.4	7
	South Reservoir	7	39	.031	.108	.08	4.6	21	11	.08	6.6	8
Winthrop	Metropolitan Water Supply											
Worcester	Pine Hill Reservoir	19	38	.122	.154	.10	2.8	17	11	.42	6.5	5
	Upper Holden Reservoir	12	33	.028	.119	.08	2.5	14	11	.25	6.5	5
	Lower Holden Reservoir	9	30	.024	.113	.08	2.5	12	10	.10	6.6	5
	Leicester Reservoir (Lynde Reservoir)	12	36	.020	.111	.08	2.5	16	11	.19	6.6	5
	Bottomly Reservoir (Kettle Brook No. 4)	19	46	.038	.206	.20	2.7	19	11	.37	6.5	5
	Kent Reservoir (Kettle Brook No. 1)	15	38	.022	.119	.08	2.5	20	11	.14	6.6	5
	Mann Reservoir (Kettle Brook No. 2	14	38	.016	.105	.08	2.6	19	11	.15	6.5	5
	Kendall Reservoir	14	35	.060	.124	.09	2.5	12	10	.30	6.5	5
	Quinapoxet Pond	29	34	.015	.126	.09	1.9	13	10	.08	6.4	5

Averages of Chemical Analyses of Ground-Water Sources for the Year 1941

City or Town	Source	(Parts per Million) Color	Residue on Evaporation	Ammonia: Free	Ammonia: Total Albuminoid	Nitrogen as: Nitrates	Nitrogen as: Nitrites	Chlorides	Hardness	Alkalinity	Fe	Mn	pH	No. of Samples
Acton (West and South Water Supply District)	Tubular wells	1	82	.006	.011	1.3	.000	4.7	38	24	.04	–	6.2	4
Amesbury	Tubular wells	20	135	.076	.033	.11	.004	5.8	60	55	4.4	.44	6.7	4
	Tubular wells, filtered	11	124	.002	.019	.10	.000	5.6	64	52	.15	.03	7.3	4
Ashland	New tubular wells	13	65	.023	.044	.15	.000	5.6	26	20	.71	–	6.1	4
Attleboro	Dug wells and filtered water (South Attleboro)	3	65	.003	.024	.29	.000	4.6	34	29	.05	–	7.1	4
	Gravel-packed wells (South Attleboro)	1	48	.004	.021	.15	.000	4.3	24	18	.05	.06	6.0	4
Auburn (Water Co.)	Tubular wells	0	111	.004	.010	1.28	.000	8.7	59	42	.05	–	6.3	5
Avon	Dug and tubular wells	2	68	.008	.023	2.56	.000	6.6	26	11	.04	–	5.7	4
Ayer	Dug well	1	102	.004	.010	3.8	.000	9.3	39	21	.05	–	6.1	4
	Tubular wells	5	81	.015	.010	.20	.000	4.7	42	45	.41	.40	6.5	5
Barnstable (Water Co.)	Tubular wells (old supply)	5	50	.010	.010	.11	.000	11.3	8	9	.23	–	5.6	4
(Fire District)	Tap in town (Yarmouth Water Supply)	2	45	.003	.007	.10	.000	13.5	10	11	.07	–	5.8	4
(Cotuit Fire and Water District)	Gravel-packed wells	1	35	.005	.017	.11	.000	9.0	5	7	.14	–	5.6	4
(Centerville-Osterville Fire District	Tubular wells	3	37	.008	.009	.47	.000	9.9	8	8	.12	–	5.5	4
	Gravel-packed wells	0	38	.005	.009	.09	.000	10.3	5	9	.04	–	5.7	4
Barre	Gravel-packed well	3	42	.005	.007	.15	.000	2.8	12	12	.40	–	5.8	4
Bedford	Dug well	6	41	.012	.022	.44	.000	4.6	18	13	.17	–	6.1	4
	Tubular wells	1	58	.006	.017	.36	.000	5.8	20	17	.10	–	6.0	4
Belchertown (Water District)	Tubular wells	1	70	.011	.009	.95	.000	6.2	35	22	.43	–	6.2	4
Bellingham	Gravel-packed well No. 1	1	45	.003	.005	.12	.000	3.2	20	21	.16	.04	6.5	4
	Gravel-packed well No. 2	1	50	.006	.015	.11	.000	3.1	22	21	.12	.03	6.5	4
Bernardston (Fire and Water District)	Dug well	1	30	.005	.011	.17	.000	1.6	13	11	.04	–	6.3	4
Billerica	Gravel-packed wells—tap in pumping station	30	96	.127	.090	.15	.000	10.8	31	23	.59	.54	6.5	4
Bourne (Bourne Water District)														
(Monument Beach)	Gravel-packed wells	0	36	.001	.003	.09	.000	7.5	10	10	.06	–	5.9	5
(Buzzards Bay Water District)	Tubular wells	0	36	.002	.004	.09	.000	7.5	5	9	.05	–	6.6	4
(Sagamore—Ware Tenement Supply)	Tubular wells	0	61	.003	.007	.70	.000	10.5	12	11	.04	.04	5.8	2
(Sagamore—Keith Block	Tubular wells	3	46	.001	.009	1.5	.000	10.3	18	18	1.03	.04	6.0	2
(Sagamore—Knowlton Property)	Tubular wells	3	50	.005	.002	.10	.000	8.7	9	13	.63	.02	6.5	2

(Sagamore—Savery Supply)	Tubular wells	0	43	.000	.003	.10	.000	9.7	7	14	.18	.01	6.1	2
(Sagamore Beach)	Tubular wells	4	61	.001	.004	.23	.003	16.8	18	14	.20	–	6.1	2
(Sagamore Heights)	Tubular wells	5	57	.002	.020	.11	.000	13.2	11	11	.50	–	5.6	2
Bridgewater	Tubular wells	1	66	.013	.009	1.8	.000	6.8	21	12	.13	–	5.9	4
Brookline	Tubular wells, gravel-packed wells, and filter gallery, raw water	52	110	.079	.073	.52	.003	9.2	52	48	1.3	.53	6.4	6
	Tubular wells, gravel-packed wells, and filter gallery, filtered	16	105	.005	.053	.44	.000	9.7	51	46	.36	.04	7.1	6
Canton	Henry's Spring well	1	60	.003	.011	.83	.000	7.3	24	14	.04	–	5.8	3
	Ward well	16	84	.012	.037	.50	.000	6.5	26	28	.14	–	6.2	4
	Springdale well	11	76	.002	.029	.43	.000	6.1	25	25	.19	.05	–	4
Chatham (Water Co.)	Tubular wells	0	46	.000	.009	.08	.000	13.1	8	8	.06	–	5.5	3
Chelmsford (North Chelmsford Fire District)	Tubular wells	22	54	.174	.083	.23	.001	4.1	21	26	.55	–	6.3	5
(Water District)	Tubular wells	2	84	.020	.030	.87	.001	5.6	34	25	.07	.14	6.2	3
Cohasset (Water Co.)	Raw water at filter plant	90	73	.047	.190	.16	.000	12.2	21	14	1.02	.10	5.8	4
	Filtered water	7	107	.034	.054	.13	.001	13.1	49	24	.06	.09	7.7	4
Colrain (Griswoldville)	Deep tubular well	0	81	.002	.014	.60	.000	3.0	57	47	.04	–	6.9	2
Colrain (Lyonsville)	Spring	1	64	.000	.002	.11	.000	1.2	42	39	.12	–	6.7	2
	Deep tubular well	0	175	.001	.002	.12	.000	2.0	76	81	.03	–	7.7	2
Cummington	Springs	1	48	.000	.002	1.8	.000	3.6	23	18	.04	.03	6.0	2
Dedham (Water Co.)	Dug and tubular wells	14	104	.032	.047	.93	.000	10.4	43	32	.18	–	6.3	4
Deerfield (Fire District)	North Springs	1	49	.003	.009	.10	.000	3.5	26	18	.04	–	6.2	3
	Harris Springs	1	60	.001	.008	2.0	.000	2.2	31	18	.04	–	6.7	3
	South Springs	2	39	.004	.010	.30	.000	1.6	22	14	.07	–	6.5	3
Douglas	Tubular wells	0	46	.006	.009	.70	.000	4.0	24	18	.04	–	6.0	4
Dover	Tubular wells	1	108	.051	.009	1.00	.030	12.0	47	38	.09	–	6.6	2
Dracut (Water Supply District)	Tubular wells, Dracut	13	121	.015	.037	1.8	.001	8.0	58	39	.53	.04	6.5	2
Dudley	Tubular wells	0	42	.006	.009	.12	.000	3.2	18	14	.05	–	6.0	3
Dunstable	Tubular wells	1	62	.005	.007	1.07	.000	2.9	25	20	.07	–	6.2	3
Duxbury (Fire and Water District)	Tubular wells	0	49	.004	.007	.27	.000	9.7	12	11	.04	–	5.8	3
East Brookfield	Well	0	33	.006	.018	.14	.000	2.4	12	11	.11	–	5.8	3
Easthampton	Tubular wells	0	79	.006	.006	.47	.000	2.5	43	47	.04	–	7.9	3
Easton (North Easton Village District)	Dug well	1	53	.004	.024	.74	.000	5.7	22	13	.05	.02	5.7	6
Easton (Unionville Fire and Water District)	North Easton Village District Water Supply													
Edgartown (Water Co.)	Dug and tubular wells	1	28	.007	.007	.11	.000	9.3	4	7	.04	.02	5.6	4
Fairhaven (Water Co.)	Tubular wells near Nasketucket River	32	71	.015	.079	.62	.001	9.9	24	17	.44	.12	5.7	6
	Tubular wells near Mattapoisett River	2	81	.005	.017	1.08	.000	16.9	24	13	.07	.11	5.7	6
Foxborough	Tubular wells	4	56	.003	.017	.60	.000	4.4	21	18	.11	–	6.1	3
Framingham	Gravel-packed well No. 1	6	95	.031	.016	.11	.000	8.7	51	45	.23	–	7.0	4
	Gravel-packed well No. 2	6	92	.042	.012	.20	.000	7.6	45	40	.96	–	6.6	4
	Gravel-packed well No. 3	1	90	.013	.012	.34	.001	6.9	41	31	.16	–	6.6	4
Franklin	Tubular wells	8	47	.011	.013	.30	.000	4.5	19	19	.48	–	6.1	3
Georgetown	Tubular wells (raw water)	8	60	.007	.005	.25	.002	3.9	23	19	.62	.02	6.1	4
	Tubular wells, filtered	2	56	.006	.007	.18	.000	3.8	25	19	.14	.03	6.5	4
Gill (Riverside Water Co.)	Spring	0	71	.001	.008	1.4	.000	2.5	37	30	.03	–	6.7	2

Averages of Chemical Analyses of Ground Water Sources, etc.— Continued

City or Town	Source	(Parts per Million) Color	Residue on Evaporation	Ammonia Free	Ammonia Total Albuminoid	Nitrogen as Nitrates	Nitrogen as Nitrites	Chlorides	Hardness	Alkalinity	Fe	Mn	pH	No. of Samples
Gosnold	Well	2	416	.001	.020	2.5	.000	189.0	99	16	.04	–	5.9	3
Grafton (Water Co.)	Gravel-packed well at North Grafton	1	66	.000	.006	.55	.000	6.0	27	23	.05	–	6.0	2
	Dug wells at Grafton	6	109	.002	.021	5.3	.000	12.7	45	26	.11	–	6.2	4
(Sandersville Supply)	Springs	1	63	.009	.013	1.74	.000	6.5	27	17	.05	–	6.0	4
(Fisherville Supply)	Springs and deep tubular wells	3	86	.348	.029	.75	.002	8.5	27	33	.70	–	6.3	4
Granville (Water Co.)	Well and springs	0	28	.003	.012	.10	.000	1.4	11	13	.08	–	6.2	3
Great Barrington (Fire District)	New infiltration gallery near Green River	0	100	.001	.006	.20	.000	1.5	93	85	.04	–	7.2	4
Greenfield	Dug well near Green River	5	71	.001	.009	.13	.000	1.5	41	39	.13	–	7.2	2
Groton (Water Co.)	Dug well	3	74	.062	.037	.14	.000	2.7	47	48	.13	–	6.6	3
Groton (West Groton Water Supply District)	Tubular wells	0	57	.007	.010	.78	.001	3.3	32	29	.23	.02	6.3	4
Hamilton	Gravel-packed and tubular wells	1	99	.004	.006	.75	.000	16.9	42	30	.09	.02	6.2	6
Hanover	Tubular wells	8	69	.001	.009	.24	.000	7.5	25	20	.18	–	5.9	4
Hardwick (Center)	Dug well	1	58	.003	.011	.17	.000	2.2	22	23	.50	–	6.6	3
Hardwick (Gilbertville)	Dug and tubular wells	0	78	.001	.014	.11	.000	2.0	46	38	.09	–	6.9	4
Hardwick (Wheelwright)	Tubular wells	1	38	.012	.005	.40	.000	2.7	11	12	.07	–	5.8	3
Harwich	Gravel-packed wells	0	52	.004	.004	.32	.000	13.5	12	11	.05	–	5.9	4
Hingham (Water Co.)	Filter galleries	12	84	.004	.030	.40	–	8.0	40	39	.08	–	8.7	6
Holliston (Water Co.)	Gravel-packed well	2	52	.001	.016	.51	.000	3.4	23	19	.26	–	6.3	5
Hopedale	Milford Water Supply													
Hopkinton	Tubular wells	0	49	.009	.015	1.3	.000	3.5	26	20	.04	–	6.3	3
Hull	Hingham Water Supply.													
Huntington (Fire District)	Tubular wells	1	62	.003	.010	.22	.000	2.9	28	20	.03	–	6.1	3
Kingston	Tubular wells	0	45	.008	.005	.15	.000	7.1	12	13	.05	–	6.1	3
Lanesborough (Village Water District)	Tubular wells	1	213	.002	.009	.22	.001	1.5	193	192	.28	–	7.5	4
Leicester (Water Supply District)	Dug wells	6	67	.007	.019	.70	.000	3.0	31	24	.10	–	6.6	3
Leicester (Cherry Valley and Rochdale Water District)	Dug wells	21	45	.012	.137	.15	.000	3.8	20	17	.12	–	6.4	3
Littleton	Tubular wells	0	41	.003	.005	.27	.000	2.5	20	15	.04	–	6.1	3
Lowell	Boulevard wells, raw water	–	68	.322	.065	.20	.001	5.4	25	30	3.5	.65	6.3	2
	Cook wells	33	102	.009	.035	.388	.000	9.2	43	31	1.7	.43	6.1	4
	Effluent of sand filter	17	56	.012	.024	.314	.001	5.0	25	24	.44	.02	6.3	5
Lynnfield (Lynnfield Center Water District)	Tubular wells	1	98	.002	.006	.90	.000	6.0	91	62	.06	.02	7.3	10
Manchester	Dug and tubular wells	4	163	.003	.009	1.07	.001	17.4	47	70	.13	–	6.9	4
Mansfield	Dug well	0	42	.004	.008	.18	.000	3.8	17	11	.05	–	5.8	4

Marblehead	Tubular wells	33	213	.031	.133	.12	.001	12.3	136	102	.22	.20	7.0	4
	Dug well	3	176	.036	.013	.13	.002	16.1	86	46	.86	.16	6.5	4
	Dug and tubular wells, filtered	17	126	.002	.099	.13	.000	14.7	66	39	.17	.04	6.9	4
Marion	Old tubular wells	1	47	.002	.010	.36	.000	7.0	15	11	.03	–	5.7	2
	New tubular wells	0	100	.002	.004	.25	.000	20.2	39	32	.07	–	6.5	2
Marshfield Main Supply	Tubular wells	1	46	.002	.007	20	.000	8.8	15	14	.04	–	6.3	4
Parsonage Street wells	Tubular wells	5	109	.003	.007	.60	.000	28.4	33	16	.28	–	5.9	4
Brant Rock wells	Dug wells	0	69	.003	.007	.10	.000	18.6	14	10	.16	–	5.9	2
Humarock Beach Supply	Tubular wells	2	83	.001	.014	.20	.000	19.7	20	16	.43	–	5.8	3
Mattapoisett	Tubular wells	4	58	.007	.008	.63	.001	8.3	23	18	.14	–	6.0	3
Medfield	Tubular wells, tap in town (supplied from State Hospital)	1	87	.008	.014	.22	.000	4.3	45	46	.07	.02	7.3	5
Medway	Tubular wells	5	87	.022	.016	.72	.001	9.5	35	34	.20	–	6.4	5
Merrimac	Tubular wells	2	66	.003	.009	.15	.000	6.2	32	18	.03	–	5.9	3
Methuen	Gravel-packed well	26	95	.021	.020	1.4	.000	9.3	40	28	.93	.20	6.1	3
	Lone Tree Hill wells	34	97	.392	.066	.41	.001	7.6	48	51	1.38	2.2	6.6	4
Middleborough	Dug well	35	71	.110	.053	.46	.001	6.6	27	25	3.0	.73	6.0	4
	Final effluent (dug well filtered)	10	64	.004	.016	.58	.000	6.7	27	22	.17	.03	6.5	4
Milford (Milford Water Co.)	Outlets of filters	17	51	.029	.043	.13	.000	3.8	30	23	.18	–	7.6	4
Millbury (Water Co.)	Dug well	0	49	.005	.017	.63	.000	4.0	25	14	.03	–	5.5	3
Millis	Dug wells	1	133	.004	.010	3.4	.000	10.6	70	37	.11	–	6.5	4
Monson	Old dug well	28	38	.007	.067	.14	.000	1.9	10	13	.10	–	6.5	4
	New dug well	1	34	.007	.023	.14	.000	2.1	9	13	.03	–	6.2	4
Montague (Montague Village)	Springs	6	53	.003	.035	.27	.000	1.6	23	23	.11	–	6.9	3
Nantucket (Wannacomet Water Company	Dug and tubular wells at Wyers Valley	1	63	.003	.006	.20	.000	17.5	22	16	.05	–	6.4	4
Nantucket (Siasconset)	Dug wells	0	66	.003	.009	.24	.000	16.9	23	17	.06	–	6.1	3
Natick	Dug well	1	119	.007	.014	.68	.000	11.4	60	49	.18	.03	6.9	4
Needham	Dug well No. 1	1	116	.001	.022	5.7	.000	9.4	42	16	.05	–	5.9	4
	Dug well No. 2	0	110	.002	.013	4.4	.001	9.0	43	21	.03	–	6.0	4
	Tubular wells (Great Plain Avenue)	5	121	.005	.017	1.1	.000	8.7	39	57	.27	–	6.3	4
	Gravel-packed well (Charles River Street)	0	101	.002	.013	.70	.000	7.9	52	48	.03	–	7.1	5
Newton	Tap in pumping station (treated water)	6	134	.057	.026	.44	.000	9.5	38	81	.16	.14	7.3	5
	Dug well No. 1	2	96	.005	.012	1.18	.001	8.1	42	36	.04	.03	6.3	5
	Dug well No. 2	2	91	.003	.017	.26	.000	8.6	45	38	.04	.02	6.3	5
	Dug well No. 3	1	90	.005	.018	.22	.000	9.5	43	36	.03	.02	6.3	5
	Dug well No. 4	2	98	.004	.018	.20	.000	8.2	50	20	.03	.02	6.3	5
North Attleborough	Dug wells	11	90	.007	.023	.48	.000	5.1	43	45	.51	.06	7.3	3
Northbridge	Tubular wells (Meadow Pond)	0	36	.003	.013	.22	.000	3.9	18	17	.04	–	5.9	2
	Tubular wells (Cook Allen)	1	32	.004	.033	.07	.000	2.4	13	9	.03	–	5.8	2
North Reading	Tap in town (Wilmington Supply)	0	71	.005	.007	.21	.000	4.3	28	24	.04	–	6.3	3
Norton	Tubular wells	2	51	.003	.009	.10	.000	3.6	17	17	.19	–	6.1	3
Norwood	Tubular wells													
	Raw water	12	105	.007	.017	.92	.000	9.2	46	28	.30	.09	6.5	4
	Final Effluent	1	98	.002	.015	.81	.000	9.6	48	28	.04	.02	6.7	4
Oak Bluffs (Cottage City Water Company	Springs	0	35	.003	.005	.10	.000	8.6	8	11	.08	–	6.0	2

Averages of Chemical Analyses of Ground-Water Sources, etc.— Concluded

City or Town	Source	(Parts per Million) Color	Residue on Evaporation	Ammonia Free	Ammonia Total Albuminoid	Nitrogen as Nitrates	Nitrogen as Nitrites	Chlorides	Hardness	Alkalinity	Fe	Mn	pH	No. of Samples
Orange	Crystal Spring	8	32	.013	.027	.10	–	1.5	13	12	.07	–	6.2	3
Oxford (Water Co.)	Tubular wells	0	54	.005	.007	.57	.000	3.8	23	19	.05	–	6.2	3
Palmer (Three Rivers)	Cheney Supply collecting well	1	47	.006	.010	.11	.000	1.9	19	21	.05	–	6.8	2
(Bondsville Water Co.)	Tubular wells	0	61	.003	.009	.53	.000	3.1	25	19	.28	–	6.4	3
Paxton	Spring	3	31	.008	.017	.10	.000	2.3	16	15	.07	–	6.4	4
Pepperell	Tubular wells	0	41	.003	.015	.16	.000	2.0	15	15	.03	–	6.1	3
Provincetown	Tubular wells	1	174	.008	.007	.11	.000	70.	40	13	.06	.04	6.2	6
Reading	New tubular wells	17	107	.024	.038	.28	.000	10.	50	31	.06	.20	6.1	4
	New tubular wells, filtered	7	102	.003	.026	.30	.000	10.3	46	29	.16	.03	7.0	4
Rockport	Tubular wells	2	81	.003	.017	.43	.000	16.6	29	21	.06	.03	6.2	5
Salisbury (Water Supply Company)	New dug well	14	105	.003	.006	.13	.000	6.6	57	55	.75	–	7.0	3
	Gravel-packed well	12	102	.008	.006	.06	.000	6.8	59	54	.70	–	6.9	1
Scituate	Webster Meadow wells	0	129	.002	.010	.77	.000	21.3	53	41	.06	–	6.8	9
	Beaver Dam wells	1	148	.005	.010	3.0	000	25.0	51	31	.15	–	6.4	2
	Kent Street wells	1	621	.001	.008	.25	.000	252.	86	22	.31	–	6.4	2
Sharon	Dug well and tubular wells	0	199	.001	.008	5.8	.000	31.3	94	60	.05	–	6.5	4
	Tubular wells	5	72	.004	.010	1.5	.000	7.2	28	24	.17	–	6.3	4
Sheffield (Water Co.)	Smith Spring	1	37	.005	.005	.13	.000	1.3	20	22	.04	–	6.2	3
	Farm House Spring	1	40	.005	.007	.13	.000	1.3	21	23	.07	–	6.3	3
	Red Rock Spring	0	40	.004	.005	.13	.000	1.2	21	23	.04	–	6.4	3
Shirley (Shirley Village Water District)	Dug wells	3	79	.010	.013	2.00	.000	6.0	30	15	.17	–	6.1	2
Shrewsbury	Gravel-packed wells (South Street)	1	56	.000	.013	.38	.002	6.8	25	19	.04	.01	5.9	3
	Gravel-packed wells (Oak Street)	0	64	.000	.010	.37	.000	4.8	27	22	.03	–	6.2	3
Somerset	Tubular wells	27	151	.005	.033	.15	.000	6.7	28	89	.70	–	7.7	4
South Hadley (Fire District No. 2)	Dug wells	3	62	.009	.014	.22	.000	4.6	31	25	.04	–	6.7	3
Sterling	Tubular wells	1	68	.001	.005	.43	.000	3.8	42	37	.06	–	6.6	4
Stockbridge (Hill Water Co.)	Springs	1	71	.003	.019	.10	.000	1.3	45	49	.12	–	7.2	2
Stoughton	Collecting gallery system	2	38	.008	.015	.14	.000	3.7	10	10	.04	.03	5.6	6
Sturbridge	Tubular wells	11	68	.004	.004	.25	.000	4.3	27	23	1.41	–	6.3	4
Sudbury	Tubular wells	2	61	.004	.005	.13	.000	3.3	30	28	.09	–	6.8	3
Sutton (Water Co.)	Dug and tubular wells	4	125	.011	.013	3.1	.000	4.9	58	49	.26	–	7.0	4
Tisbury	Tashmoo Spring	1	45	.009	.010	.11	.000	11.7	7	11	.04	.02	5.9	4
Topsfield (Topsfield Water Co., Inc.)	Dug and tubular wells	3	183	.020	.013	.44	.000	12.5	115	106	.19	–	7.2	4
Townsend	Tubular wells	0	31	.001	.004	.20	.000	2.6	10	11	.03	–	5.7	4
Upton (West Upton)	Tubular wells	0	81	.010	.009	1.00	.000	6.1	33	18	.09	–	5.9	4
Uxbridge	Tubular wells, new system	3	64	.010	.010	1.53	.000	5.3	23	17	.53	–	5.9	3

Wakefield	Tubular wells	0	143	.008	.006	1.9	.000	21.4	50	28	.06	–	6.2	2
Walpole	Tubular wells	0	59	.006	.017	.68	.000	4.9	26	21	.05	–	6.2	3
Waltham	Old dug well	17	102	.076	.028	.20	.001	9.4	47	51	1.19	.65	6.4	5
	New dug well	1	80	.001	.015	.45	.000	7.9	40	31	.04	.05	6.3	5
Ware	Large well, treated	0	69	.006	.010	1.04	.000	3.8	28	22	.05	–	6.2	4
Wareham (Wareham Fire District)	Tubular wells	1	35	.006	.009	.16	.000	6.2	10	11	.09	–	5.6	4
Warren (Warren Water District)	Tubular wells	0	38	.006	.007	.28	.000	2.9	14	14	.05	–	6.0	3
(West Warren Water Co.)	Dug wells	1	48	.000	.003	1.61	.000	1.8	21	16	.04	–	6.1	2
Wayland	Gravel-packed and tubular wells	6	108	.011	.013	.67	.001	6.3	47	30	.57	–	6.5	3
Webster	Tubular wells	1	42	.009	.010	.30	.000	3.4	20	20	.06	–	6.3	4
Wellesley	Tubular wells at pumping station No. 1	0	85	.004	.011	.77	.000	8.3	42	36	.04	–	6.3	3
	Dug well at pumping station No. 2.	1	79	.003	.003	.87	.000	6.9	38	27	.06	–	6.3	3
	Large tubular well at pumping station No. 3	3	84	.001	.003	.83	.000	5.8	39	24	.35	–	6.2	3
	Gravel-packed well at pumping station No. 4.	1	83	.013	.013	.24	.000	6.3	40	35	.06	–	6.6	3
Westborough	Filter basin	8	31	.010	.094	.07	000	3.0	12	10	.07	–	6.5	4
West Brookfield	Tubular wells	1	43	.007	.006	.18	.000	2.9	13	9	.07	–	5.6	3
Westford (Water Co.)	Tubular wells (Westford)	0	50	.003	.007	.20	.000	2.3	24	27	.06	–	6.7	3
(Abbot Worsted Company)	Tubular wells	0	87	.007	.008	.47	.000	3.6	37	29	.04	–	6.3	3
Weston	Tubular wells at Warren Avenue	3	91	.010	.019	1.60	.000	7.5	47	30	.12	–	6.3	4
	Tubular wells at Kendall Green	1	77	.006	.014	.78	.000	6.1	34	24	.12	–	6.3	4
(Keewaydin Water Works)	Dug well	2	73	.004	.018	.52	.000	5.2	33	20	.05	.02	6.1	11
(Water Company)	Dug well A	3	65	.000	.016	.12	.000	5.2	39	26	.03	–	6.2	1
	Dug well C	12	86	.010	.045	.35	.000	7.3	38	28	.35	–	6.1	2
(Glen Farms Water Co.)	Dug well	4	114	.024	.019	2.18	.000	8.1	56	34	.16	–	6.6	2
(R. B. Rand Supply)	Dug well	3	85	.008	.007	2.47	.000	5.9	37	19	.58	.02	6.3	3
West Stockbridge (East Mountain Water Co.)	Johnson's Spring	0	136	.002	.003	.15	.000	2.2	104	100	.05	–	7.0	2
	Blake's Spring	2	140	.002	.026	.20	.000	1.0	123	118	.03	–	7.5	1
	Sartori Spring	0	169	.000	.002	.20	.000	1.3	160	153	.05	–	7.5	2
Westwood	Dedham Water Supply													
(Water Company)	Tubular wells	0	80	.000	.008	2.0	.000	7.6	39	22	.05	–	6.1	1
Whately (Craft Supply)	Springs	5	151	.001	.008	8.5	.000	7.8	73	43	.24	–	6.8	2
Williamstown (Water Co.)	Cold Spring	0	138	.004	.008	.31	.000	1.1	149	125	.04	–	7.5	3
	Sherman Spring	3	76	.012	.051	.09	.000	1.1	62	58	.05	–	7.5	3
Wilmington	Tubular wells	0	64	.000	.016	.35	.000	4.4	27	24	.05	–	6.3	4
Winchendon	Old dug well	24	48	.052	.037	.12	.001	1.7	16	13	3.2	–	5.5	4
	New dug well	17	32	.011	.038	.18	.001	1.7	11	9	.28	–	5.4	4
Winchester	Pond Street wells	2	241	.004	.015	.68	.000	43.7	113	69	.04	–	6.7	4
Woburn	Dug well	3	109	.014	.075	.34	.002	13.3	52	39	.15	–	6.7	4
	Gravel-packed well A	3	112	.002	.039	.34	.001	14.2	53	38	.14	–	6.6	4
	Gravel-packed well A-2	1	117	.030	.022	.21	.000	11.6	62	54	.04	–	6.9	4
	Gravel-packed well B	0	106	.012	.022	.19	.000	11.2	52	41	.05	–	6.7	4
	Gravel-packed well D	1	84	.005	.013	.16	.000	9.9	41	28	.04	–	6.3	4
	Gravel-packed well E	1	124	.001	.012	3.9	.000	13.7	56	24	.04	–	6.2	4
Worthington (Fire District)	Springs	9	35	.001	.020	.10	.000	1.3	18	15	.16		6.5	2
Wrentham	Large tubular wells	0	77	.007	.009	3.3	.000	5.0	33	15	.06	–	6.0	3
Yarmouth	Tubular wells	0	51	.006	.007	.10	.000	13.5	8	9	.04	–	5.6	3

The following table shows the normal rainfall as deduced from the records of seven long-term stations located at Amherst, Boston, Dalton, Fitchburg, Lowell, New Bedford and Northbridge; also the rainfall for the year 1941 and the excess or deficiency for each month as compared with the normal.

Month	Normal Rainfall (inches)	Rainfall in 1941 (inches)	Excess or Deficiency in 1941 (inches)
January	3.59	3.17	—0.42
February	3.35	2.25	—1.10
March	3.81	2.34	—1.47
April	3.59	1.21	—2.38
May	3.52	2.80	—0.72
June	3.48	4.11	+0.63
July	3.80	4.27	+0.47
August	4.15	3.69	—0.46
September	3.60	0.96	—2.64
October	3.51	2.23	—1.28
November	3.75	2.91	—0.84
December	3.55	3.73	+0.18
Totals	43.70	33.67	—10.03

Table Showing the Average Yield of the Sudbury River for Each Month in the Year 1941, in Cubic Feet per Second per Square Mile of Drainage Area, and in Million Gallons per Day per Square Mile of Drainage Area; also Departure from the Normal.

Month	Normal Yield		Actual Yield in 1941		Excess or Deficiency	
	Cubic Feet per Second per Square Mile	Million Gallons per Day per Square Mile	Cubic Feet per Second per Square Mile	Million Gallons per Day per Square Mile	Cubic Feet per Second per Square Mile	Million Gallons per Day per Square Mile
January	1.768	1.142	1.139	0.736	—0.629	—0.406
February	2.273	1.469	2.103	1.359	—0.170	—0.110
March	4.103	2.652	2.093	1.353	—2.010	—1.299
April	3.141	2.030	1.586	1.025	—1.555	—1.005
May	1.659	1.072	0.545	0.352	—1.114	—0.720
June	0.817	0.528	0.254	0.164	—0.563	—0.364
July	0.360	0.233	—0.077	—0.050	—0.437	—0.283
August	0.309	0.200	—0.364	—0.235	—0.673	—0.435
September	0.436	0.281	—0.376	—0.243	—0.812	—0.524
October	0.593	0.383	—0.324	—0.210	—0.916	—0.593
November	1.179	0.762	0.023	0.015	—1.156	—0.747
December	1.512	0.977	0.287	0.185	—1.225	—0.792
Average for whole year	1.508	0.975	0.564	0.364	—0.944	—0.611

The rainfall on the Sudbury River watershed and the total yield expressed in inches in depth (inches of rainfall collected) for each of the past six years 1936 to 1941, inclusive, together with the average for 67 years are given in the following table:

Table Showing the Average Yield of the Nashua River for Each Month in the Year 1941, in Cubic Feet per Second per Square Mile of Drainage Area, and in Million Gallons per Day per Square Mile of Drainage Area; also Departure from the Normal.

Month	Normal Yield		Actual Yield in 1941		Excess or Deficiency	
	Cubic Feet per Second per Square Mile	Million Gallons per Day per Square Mile	Cubic Feet per Second per Square Mile	Million Gallons per Day per Square Mile	Cubic Feet per Second per Square Mile	Million Gallons per Day per Square Mile
January	1.913	1.237	1.221	0.789	—0.692	—0.448
February	1.986	1.283	1.846	1.193	—0.140	—0.090
March	3.943	2.548	1.760	1.138	—2.183	—1.410
April	3.654	2.361	2.105	1.361	—1.549	—1.000
May	1.997	1.291	1.078	0.697	—0.919	—0.594
June	1.288	0.832	0.625	0.404	—0.663	—0.428
July	0.758	0.490	0.475	0.307	—0.283	—0.183
August	0.626	0.405	0.470	0.304	—0.156	—0.101
September	0.729	0.471	—0.018	—0.012	—0.747	—0.483
October	0.740	0.478	—0.482	—0.312	—1.222	—0.790
November	1.274	0.823	0.473	0.306	—0.801	—0.517
December	1.761	1.138	0.737	0.476	—1.024	—0.662
Average for whole year	1.720	1.112	0.850	0.549	—0.870	—0.563

Flow of the Merrimack River at Lawrence in Cubic Feet per Second per Square Mile

Month	1936	1937	1938	1939	1940	1941	Mean for sixty-two years, 1880–1941
January	1.687	2.620	2.117	1.760	.481	1.571	1.332
February	1.413	2.475	2.416	1.527	.486	1.874	1.373
March	10.408	2.067	2.467	2.403	1.143	1.441	2.755
April	4.477	3.679	2.884	5.691	6.314	2.356	3.676
May	1.867	4.289	1.862	2.735	4.182	.952	2.260
June	.705	2.104	1.310	1.016	2.430	.539	1.269
July	.478	.969	2.039	.489	.940	.536	.772
August	.359	.575	1.898	.508	.520	.294	.645
September	.411	.521	4.156	.367	.709	.267	.695
October	.889	.827	1.894	.399	.407	.326	.796
November	.969	2.083	1.640	.849	1.488	.529	1.153
December	2.306	2.679	3.309	.688	1.335	.594	1.158
Average for whole year	2.164	2.074	2.333	1.536	1.703	.940	1.490
Average for driest six months	.635	1.180	2.077	.550	.900	.415	.870

Weekly Flow of the Sudbury, Nashua and Merrimack Rivers

The following table shows the weekly fluctuations during the year 1941 in the yield of the Sudbury River at Framingham, the South Branch of the Nashua River at the outlet of the Wachusett Reservoir in Clinton and the Merrimack River at Lawrence. The flow of these streams, particularly that of the Sudbury River and the South Branch of the Nashua River, serves to indicate the flow of other streams in eastern Massachusetts. The area of the Sudbury River watershed is 75.2 square miles, of the South Branch of the Nashua River 107.69 square miles and of the Merrimack River at Lawrence 4,463 square miles.

Table Showing the Average Weekly Flow of the Sudbury, South Branch of the Nashua and the Merrimack Rivers for the Year 1941, in Cubic Feet per Second per Square Mile of Drainage Area

Week ending Sunday	Yield of Sudbury River	Yield of South Branch Nashua River	Flow of Merrimack River	Week ending Sunday	Yield of Sudbury River	Yield of South Branch Nashua River	Flow of Merrimack River
Jan. 5	2.413	2.145	2.710	July 6	0.056	0.284	0.311
12	0.906	1.072	1.637	13	0.014	0.391	0.518
19	1.002	1.035	1.327	20	−0.129	0.445	0.698
26	1.098	1.205	1.218	27	−0.769	0.396	0.578
Feb. 2	0.777	0.977	1.160	Aug. 3	0.009	0.863	0.490
9	1.918	2.632	1.460	10	−0.703	0.410	0.367
16	2.962	2.404	2.806	17	−0.887	0.448	0.220
23	1.716	1.371	1.855	24	0.584	0.398	0.286
Mar. 2	1.176	0.955	1.441	31	−0.147	0.608	0.273
9	1.568	1.566	1.348	Sept. 7	−0.036	0.289	0.279
16	1.294	1.340	1.279	14	−0.448	0.306	0.295
23	1.559	1.301	1.285	21	−0.462	−0.170	0.270
30	3.993	2.948	1.814	28	−0.402	−0.366	0.227
Apr. 6	2.779	3.426	2.262	Oct. 5	−0.216	−0.438	0.212
13	1.999	2.647	2.862	12	−0.913	−0.528	0.302
20	1.231	1.702	2.825	19	−0.199	−0.606	0.424
27	1.061	1.247	1.822	26	−0.520	−0.714	0.329
May 4	0.652	1.152	1.230	Nov. 2	0.725	0.573	0.305
11	1.151	1.626	1.150	9	0.092	0.629	0.817
18	0.726	1.126	1.197	16	−0.108	0.237	0.613
25	0.191	0.872	0.725	23	−0.143	0.342	0.377
June 1	−0.061	0.474	0.618	30	−0.186	0.258	0.402
8	0.407	1.118	0.573	Dec. 7	0.027	0.438	0.338
15	0.183	0.450	0.470	14	0.395	0.904	0.363
22	0.335	0.553	0.680	21	0.234	0.737	0.491
29	−0.007	0.447	0.451	28	0.573	0.907	0.903

TABLE 6.— *Efficiency of Sand Filters (Per Cent Removal)*

Parts per Million and Per Cent

City or Town	Free Ammonia			Total Albuminoid Ammonia			Kjeldahl Nitrogen			Chlorides		B. O. D.		
	Applied Sewage	Effluent	Per Cent Removal	Applied Sewage	Effluent	Per Cent Removal	Applied Sewage	Effluent	Per Cent Removal	Applied Sewage	Effluent	Applied Sewage	Effluent	Per Cent Removal
Attleboro	41.6	19.0	54	7.68	1.76	77	16.5	4.1	75	34	34	180	33	82
Brockton	51.2	26.5	48	8.15	1.75	79	18.3	4.2	77	91	82	383	40	90
Clinton	19.5	9.1	53	6.46	1.55	76	12.1	3.6	70	52	49	242	52	79
Concord	24.9	3.8	85	9.03	0.18	98	16.6	0.3	98	37	27	150	1	99
Easthampton	34.7	13.0	63	6.37	0.75	88	13.3	1.7	87	39	38	260	3	99
Franklin	22.4	10.1	55	3.09	1.64	47	6.9	3.9	43	24	33	276	2	99
Gardner (Gardner Area)	38.4	20.3	47	8.35	1.69	80	15.5	4.0	74	47	48	283	13	95
Gardner (Templeton Area)	52.1	25.8	50	5.27	1.98	62	8.8	3.7	58	46	45	192	46	76
Hopedale	44.7	13.2	70	4.72	0.70	85	9.8	1.4	86	40	32	153	5	97
Hudson	57.0	41.5	27	7.55	2.43	68	15.9	5.2	67	57	53	408	107	74
Leicester	21.1	11.0	48	6.05	1.53	75	14.9	3.0	80	20	24	235	23	90
Lenox	20.3	2.6	87	2.37	0.46	81	5.7	1.0	82	21	23	111	3	97
Marion	11.6	0.1	99	1.47	0.18	88	3.5	0.4	89	128	138	63	1	98
Marlborough	39.9	16.2	59	7.50	0.80	89	14.2	1.9	87	42	44	290	2	99
Medfield	22.7	10.1	56	7.53	1.66	78	17.0	4.8	72	29	29	232	28	88
Millis	17.7	0.2	99	2.19	0.17	92	5.1	0.7	86	29	28	46	2	96
North Attleborough	15.2	7.3	52	3.89	0.41	89	9.0	0.9	90	25	22	65	7	89
Northbridge	34.6	5.4	84	4.50	1.01	78	9.3	2.8	70	31	25	108	5	95
Pittsfield	20.5	7.8	62	3.97	1.01	75	8.8	2.3	74	47	53	148	16	89
Southbridge	51.2	24.6	52	6.65	1.90	71	12.0	3.8	68	46	42	183	5	97
Spencer (new beds)	21.2	11.6	45	6.97	1.17	83	15.7	2.5	84	30	28	195	21	89
Spencer (old beds)	21.2	6.4	70	6.97	0.38	95	15.7	1.1	93	30	28	195	3	98
Stockbridge	19.2	2.5	87	3.41	0.54	84	8.4	2.3	73	16	26	145	3	98
Westborough	34.4	10.6	69	8.33	1.47	82	15.6	3.3	79	74	182	245	15	94
Winchendon	21.9	1.3	94	3.49	0.21	94	8.3	0.6	93	24	27	103	1	99

TABLE No. 7.— *Summary of Efficiency of Sewage Disposal Works (Per Cent Removed from Raw Sewage to Final Effluent)*

Parts per Million and Per Cent

City or Town	Suspended Solids			Free Ammonia			Total Albuminoid Ammonia			Kjeldahl Nitrogen			Chlorides		Oxygen Consumed			B.O.D.		
	Raw Sewage	Final Effluent	Per Cent Removed	Raw Sewage	Final Effluent	Per Cent Removed	Raw Sewage	Final Effluent	Per Cent Removed	Raw Sewage	Final Effluent	Per Cent Removed	Raw Sewage	Final Effluent	Raw Sewage	Final Effluent	Per Cent Removed	Raw Sewage	Final Effluent	Per Cent Removed
Amherst	184	77	58	33.1	34.1	–	7.37	5.29	28	14.3	11.8	17	35	31	65	46	29	263	170	35
Attleboro.	376	23	94	41.6	19.0	54	7.68	1.76	77	16.5	4.1	75	34	34	67	18	73	180	33	82
Brockton	266	77	71	52.8	35.6	33	11.35	4.80	58	23.5	10.8	54	88	98	160	78	51	537	47	91
Clinton	283	23	92	20.6	9.1	56	14.65	1.55	89	27.8	3.6	87	84	49	493	37	92	515	52	90
Concord	118	4	97	24.9	3.7	85	9.03	0.18	98	16.6	0.3	98	37	27	74	4	95	150	1	99
Easthampton	142	24	83	40.5	13.0	68	7.97	0.75	91	15.3	1.7	89	39	38	80	11	86	363	3	99
Fitchburg	193	37	81	25.5	6.3	75	7.33	1.66	77	15.9	3.6	77	30	30	63	16	75	152	17	89
Framingham	274	67	76	53.8	18.6	65	10.30	4.73	54	20.8	7.9	62	41	54	109	39	64	238	42	82
Franklin	189	29	85	33.0	10.1	69	8.90	1.64	82	17.0	3.9	77	37	33	80	13	84	238	2	99
Gardner (Gardner Area)	192	17	91	38.4	20.3	47	8.35	1.69	80	15.5	4.0	74	47	48	78	17	78	283	13	95
Gardner (Templeton Area)	226	30	87	66.4	25.8	61	10.95	1.98	82	20.5	3.7	82	53	45	95	19	80	207	46	78
Greenfield	172	102	41	28.6	29.8	–	6.90	4.16	40	14.5	10.1	30	32	30	71	43	39	240	160	33
Hopedale	143	7	95	45.9	13.2	71	6.00	0.70	88	12.7	1.4	89	48	32	69	11	84	235	5	98
Hudson	321	61	81	70.0	41.5	41	12.60	2.43	81	21.2	5.2	75	65	53	112	39	65	345	107	69
Leicester	119	18	85	21.1	11.0	48	6.05	1.53	75	14.9	3.0	80	20	24	72	15	79	235	23	90
Lenox	149	6	96	16.1	2.6	84	4.91	0.46	91	11.4	1.0	91	25	23	56	6	89	141	3	98
Leominster	176	8	95	29.6	22.8	23	6.38	1.26	80	11.8	2.6	78	31	25	65	12	82	155	19	88
Ludlow	252	79	69	41.8	36.0	14	8.50	5.75	32	20.0	13.5	33	43	38	130	140	–	265	260	2
Mansfield	323	29	91	28.4	9.6	66	9.00	2.33	74	19.0	4.9	74	38	48	110	19	83	287	36	87
Marion	61	14	77	23.7	0.1	100	2.90	0.18	94	6.8	0.4	94	104	138	33	5	85	90	1	99
Marlborough	283	13	95	49.0	16.2	67	16.92	0.80	95	31.2	1.9	94	73	44	172	9	95	533	2	100
Maynard	536	32	94	50.8	20.9	59	19.87	2.44	88	47.6	7.2	85	55	40	177	21	88	408	20	95
Medfield	127	4	97	22.7	10.1	56	7.53	1.66	78	17.0	4.8	72	29	29	85	17	80	232	28	88
Milford	174	36	79	44.2	10.5	76	7.90	2.68	66	16.3	5.1	69	63	46	94	21	78	173	18	90
Millis	34	28	18	17.7	0.2	99	2.19	0.17	92	5.1	0.7	86	29	28	27	5	81	46	2	96
Natick	676	85	87	32.3	3.3	90	8.70	2.64	70	20.1	6.8	66	54	49	197	61	69	317	27	91
North Adams	221	84	62	26.9	22.8	15	6.08	3.73	39	17.0	10.1	41	30	24	72	40	44	210	111	47
North Attleborough	84	7	92	15.4	7.3	53	4.17	0.41	90	11.5	0.9	92	23	22	40	6	85	70	7	90
Northbridge	185	9	95	34.6	5.4	84	6.15	1.01	84	12.0	2.8	77	36	25	74	10	86	170	5	97
Pittsfield	196	23	88	25.1	2.9	88	9.65	1.75	82	17.4	3.5	80	60	38	93	20	78	250	17	93
Southbridge	208	47	77	40.4	24.6	39	7.65	1.90	75	15.0	3.8	75	57	42	80	14	83	280	5	98
Spencer (new beds)	172	39	77	21.2	11.6	45	6.97	1.17	83	15.7	2.5	84	30	28	86	15	83	195	21	89
Spencer (old beds)	172	14	92	21.2	6.4	70	6.97	0.38	95	15.7	1.1	93	30	28	86	9	90	195	3	98
Springfield (Main plant)	146	75	49	17.2	16.8	2	4.43	3.40	23	10.7	9.3	13	41	39	52	41	21	134	101	25
Springfield (Indian Ordhard)	124	54	56	21.0	22.2	–	4.64	3.58	23	11.0	8.1	26	26	26	43	33	23	172	116	33
Stockbridge	75	13	83	19.2	2.5	87	3.41	0.54	84	8.4	2.3	73	16	26	42	7	83	145	3	98
Westborough	187	15	92	34.4	10.6	69	8.33	1.47	82	15.6	3.3	79	74	181	46	26	43	245	15	94
Winchendon	173	13	92	32.8	1.3	96	8.40	0.21	98	17.0	0.6	96	35	27	76	4	95	267	1	100
Worcester	389	73	81	23.0	24.8	–	7.12	1.82	74	22.3	4.7	79	100	73	132	26	80	192	26	86

TABLE No. 8.— *Extent of Sewage Works, Rate of Flow, and Rate of Operation of Filters*

City or Town	Population, Census of 1940	Approximate Length of Sanitary Sewers (Miles)	Approximate Number of House Connections	Estimated Quantity of Sewage Treated (Gallons per Day)			Estimated Quantity of Sewage per Connection (Gallons per Day)	Net Area of Filter Beds (Acres)	Estimated Rate of Operation with Even Distribution (Gallons per Acre per Day)
				Average for Year	Average for Month of Maximum Flow	Average for Month of Minimum Flow			
Amherst	6,410	–	–	516,000	753,000	296,000	–	–	–
Attleboro	22,071	38.58	2,004	741,000	1,160,000	543,000	370	15.50	48,000
Barnstable	8,333	–	–	87,000	146,000	62,000	–	4.13	21,000
Brockton	62,343	116.80	8,949	3,041,000[1]	3,561,000	2,587,000	340	37.00 *	–
Clinton	12,440	–	1,969	1,257,000[2]	1,738,000	972,000	638	26.23	48,000
Concord	7,972	17.73	841	420,000	586,000	313,000	499	7.41	57,000
Easthampton	10,316	–	–	–	–	–	–	2.20	–
Fitchburg	41,824	70.99	–	2,930,000	3,740,000	2,410,000	–	– *	–
Foxborough	6,303	–	–	–	–	–	–	–	–
Framingham	23,214	56.01	4,041	1,286,000	2,072,000	958,000	318	– *	–
Franklin	7,303	14.28	883	218,000	258,000	174,000	247	3.24	67,000
Gardner	20,206	40.42	2,777	–	–	–	–	16.50	–
Greenfield	15,672	40.80	2,885	994,000	1,531,000	637,000	345	–	–
Hopedale	3,113	7.08	371	177,000[3]	234,000	155,000	477	3.79	47,000
Hudson	8,042	14.96	1,195	533,000	570,000	486,000	446	9.00	59,000
Leicester	4,851	–	–	–	–	–	–	0.73	–
Lenox	2,884	10.59	406	–	–	–	–	2.50	–
Leominster	22,226	–	–	1,936,000	2,906,000	1,552,000	–	– **	–
Ludlow	8,181	25.00	655	–	–	–	–	–	–
Mansfield	6,530	10.19	232	–	–	–	–	– *	–
Marion	2,030	4.84	282	187,000	322,000	60,000	663	1.53	122,000
Marlborough	15,154	36.9	2,708	1,352,000	1,776,000	1,040,000	499	20.19	67,000
Maynard	6,812	12.80	857	181,000	187,000	176,000	211	– *	–
Medfield	4,384	2.75	151	–	–	–	–	1.61	–
Milford	15,388	26.53	1,946	755,000	985,000	504,000	388	– *	–
Millis	2,278	1.50	15	–	–	–	–	1.12	–
Nantucket	3,401	22.75[4]	1,670[4]	549,000	738,000	356,000	329	8.00[5]	69,000
Natick	13,851	–	–	752,000	1,108,000	542,000	–	– *	–
North Adams	22,213	38.98	5,243	2,179,000	2,876,000	1,739,000	416	–	–
North Attleborough	10,359	18.33	1,143	–	–	–	–	8.75	–
Northbridge	10,242	16.61	1,058	1,278,000	1,384,000	1,020,000	1,208	12.00	107,000
Pittsfield	49,684	96.54	7,664	4,648,000	5,088,000	4,212,000	606	– *	–
Southbridge	16,825	–	–	863,000	979,000	745,000	–	10.95	79,000
Spencer	6,641	10.52	870	538,000	671,000	494,000	618	12.30	44,000
Springfield (main plant)	149,554	–	–	15,887,000	17,040,000	15,170,000	–	–	–
Springfield (Indian Orchard)	–	–	–	776,000	849,000	715,000	–	–	–
Stockbridge	1,815	4.02	250	–	–	–	–	–	–
Westborough	6,463	8.75	621	317,000	475,000	266,000	510	6.62	48,000
Winchendon	6,575	17.10	554	186,000	248,000	132,000	336	4.00	47,000
Worcester	193,694	261.42	31,582	19,750,000	23,460,000	17,350,000	625	– *	–

[1] Includes an average of 2,659,000 gallons per day to trickling filter and 382,000 gallons per day to sand filters.
[2] Entire quantity of sewage not treated.
[3] New development not included in average.
[4] Four miles of sewers and 184 connections in addition to Siasconset.
[5] No underdrains: filters drain direct to ocean.
[6] Includes 70.2 miles of combined sewers.
* For trickling filter data see Table No. 4.
** Activated sludge plant.

THE DIVISION OF TUBERCULOSIS

ALTON S. POPE, M.D., *Director*

In 1941 the long-continued decline in tuberculosis morbidity and mortality appears to have been temporarily checked. This change in the trend is probably related to the war, but is as yet no greater than has occasionally been observed in the past. The number of reported cases of tuberculosis (all forms) was 3,282, or 172 more than last year; the increase is at least partly due to the extensive use of the chest X-ray in military recruits, so that the actual reported incidence of the disease is essentially unchanged. The number of deaths was 1,632 as against 1,598 in 1940.

Tuberculosis morbidity and mortality rates for the last five years will be found in the summary of the Division of Communicable Diseases.

STATE SANATORIA

All the sanatoria have experienced increasing difficulty in securing employees and have been forced at times to employ less capable help or leave positions unfilled. In one of the institutions it became necessary to close a ward for a considerable period, owing to insufficient nurses to care for all patients. Another change which has seriously affected our institutions is rising costs, especially food costs.

There was a shortage of beds for women with nonpulmonary tuberculosis at Lakeville for a part of the year, and waiting lists of cancer cases at Pondville and Westfield. Rutland and North Reading had a variable number of empty beds, and the Westfield Tuberculosis Section a few.

COUNTY AND MUNICIPAL SANATORIA

Legislation was passed in 1941 providing for an investigation of the direct charges to towns for patients in county sanatoria. Another bill was passed which in effect made tuberculosis, or any other infection acquired by hospital employees in contact with patients, compensable under the Workmen's Compensation Act.

STATE SUBSIDY

The total subsidy paid to cities and towns for the care of patients in county and municipal sanatoria in 1941 amounted to $467,541.95. This represents a decrease of $19,513.62 from the 1940 figure. Prior to 1941, subsidy payments had increased each year since the subsidy law was passed in 1911.

CLINIC SERVICES

The school case-finding program results can be seen from the appended table. A number of surveys of colleges and institutions were also made and are summarized in this table. Reclassification clinics were held in 60 communities.

The clinic was called upon for the largest task it has ever faced in the X-raying of approximately 34,000 National Guardsmen and soldiers inducted into the army under Selective Service during the year. These films, furnished by the army, were exposed, processed and interpreted entirely by our clinic personnel using the regular portable X-ray machines. Full details of this work are given in an article to be published in the Commonhealth. The army has now taken over the task with its own staff and equipment.

I. *Clinics Held in Public and Parochial High Schools During the School Year 1940–1941*

A. New Clinics

Number of towns and cities visited	31
Children tuberculin tested	14,487
Reactors	4,363
Per cent of reactors	30%
Number X-rayed	5,237
Pulmonary tuberculosis, active or healed*	17
Incidence of tuberculosis per 1,000 X-rayed	3.2

*Includes only previously unrecognized cases; does not include suspicious cases which may later be confirmed.

B. Re-examination Clinics

Number of towns and cities visited	31
Children X-rayed	1,252
New diagnosis of pulmonary tuberculosis made	1
Incidence of tuberculosis per 1,000 X-rayed	1

II. *X-ray Surveys Made During 1941*

	X-rays Taken	Pulmonary Tuberculosis (Active and Healed)*	Incidence per 1,000
National Guard	9,832	45	4.6
Regular Army	1,896	9	4.7
Selective Service	22,825	135	5.9
Holyoke Mills	425	7	16
Women's Reformatory	328	4	12
Medical and dental schools	302	3	10
Teachers colleges (9)	1,074	1	1
Other colleges (7)	1,869	1	1

*Includes only previously unrecognized cases; does not include suspicious cases which may later be confirmed.

Arthritis Hospitalization

The contract with the Massachusetts General Hospital for the use of 20 beds for the treatment of arthritic patients was renewed this year, and the program for the study of arthritis continued without interruption.

LAKEVILLE STATE SANATORIUM

LEON A. ALLEY, M.D., *Superintendent***
CLAIRE W. TWINAM, M.D., *Acting Superintendent*

To PAUL J. JAKMAUH, M.D., *Commissioner of Public Health:*

I have the honor to submit the summary of activities of the Lakeville State Sanatorium for the year ending November 30, 1941.

TABLE 1.— *Admissions and Discharges*

Tuberculosis Patients

	ADULTS		CHILDREN		
	Males	Females	Males	Females	Totals
Patients in the sanatorium November 30, 1940	68	49	62	42	221
Patients admitted December 1, 1940, to November 30, 1941	58	69	38	29	194
Patients discharged December 1, 1940, to November 30, 1941	73	59	45	18	195
Patients remaining in sanatorium November 30, 1941	55*	60*	53	52	220
Deaths	7	6	4	1	18
Daily average number of patients	61.3	52.5	62.2	46.1	222.1

*2 boys and 1 girl reached the age of 21 during the year and were shifted to adult columns.

Poliomyelitis Patients

Patients in the sanatorium November 30, 1940	4	3	19	20	46
Patients admitted December 1, 1940, to November 30, 1941	10	6	26	26	68
Patients discharged December 1, 1940, to November 30, 1941	7	9	28	32	76
Patients remaining in sanatorium November 30, 1941	7	2*	17	12	38
Deaths	–	–	–	–	–
Daily average number of patients	2.8	2.0	15.3	20.0	40.1

*2 girls reached the age of 21 during the year and were shifted to adult columns.

Total of Tuberculosis and Poliomyelitis Patients

Patients in the sanatorium November 30, 1940	72	52	81	62	267
Patients admitted December 1, 1940, to November 30, 1941	68	75	64	55	262
Patients discharged December 1, 1940, to November 30, 1941	80	68	73	50	271
Patients remaining in sanatorium November 30, 1941	62*	62*	70	64	258
Deaths	7	6	4	1	18
Daily average number of patients	64.1	54.5	77.5	66.1	262.2

*2 boys and 3 girls reached the age of 21 during the year and were shifted to adult columns.

**On Military Leave of Absence.

TABLE 2.— *Diagnosis and Classification on Admission*

Tuberculosis Patients

(Classification by Most Serious Lesion Present)

	Adults		Children		
	Males	Females	Males	Females	Total
Tuberculosis:					
Of intestines and peritoneum	2	9	–	9	20
Of the vertebral column	7	8	8	2	25
Of the bones and joints (vertebral column excepted)	13	8	7	5	33
Of the lymphatic system (bronchial, mesenteric and retroperitoneal glands excepted)	6	17	2	6	31
Of the genitourinary system	13	16	6	2	37
Of the skin and subcutaneous cellular tissue	7	1	–	–	8
Of other organs	6	5	4	3	18
Unclassified	3	3	3	–	9
Nontuberculous disease	1	2	8	2	13
Total	58	69	38	29	194

Poliomyelitis Patients

Stage II	7	–	2	–	9
Stage III	1	1	5	–	7
Stage IV	2	5	19	26	52
Total	10	6	26	26	68

TABLE 3.— *Ages of Patients Admitted*

	Tuberculosis Patients		Poliomyelitis Patients		Total of Tuberculosis and Poliomyletis Patients		
	Males	Females	Males	Females	Males	Females	Total
Under 5 years	2	5	–	–	2	5	7
5 to 9 years	8	3	2	–	10	3	13
10 to 14 years	7	5	12	8	19	13	32
15 to 19 years	19	11	10	15	29	26	55
20 to 29 years	19	29	6	6	25	35	60
30 to 39 years	14	22	6	3	20	25	45
40 to 49 years	12	10	–	–	12	10	22
50 to 59 years	8	7	–	–	8	7	15
60 to 69 years	6	5	–	–	6	5	11
70 and over	1	1	–	–	1	1	2
Total	96	98	36	32	132	130	262

TABLE 4.— *Condition on Discharge*

Tuberculosis Patients

	Adults		Children			
	Males	Females	Males	Females	Totals	Percentages
Arrested	19	13	18	12	62	31.8
Apparently arrested	9	5	4	–	18	9.2
Quiescent	26	11	4	2	43	22.1
Improved	4	14	1	–	19	9.7
Unimproved	3	3	–	–	6	3.1
Deaths	7	6	4	1	18	9.2
Not considered	2	3	1	–	6	3.1
Nontuberculous	3	4	13	3	23	11.8
Totals	73	59	45	18	195	100.0

Poliomyelitis Patients

Improved	7	8	26	29	70	92.1
Unchanged	–	1	2	3	6	7.9
Totals	7	9	28	32	76	100.0

TABLE 5.— *Deaths of Tuberculosis Patients by Length of Residence in Sanatorium*

	Adults		Children		
	Males	Females	Males	Females	Totals
Less than 1 month	–	1	–	–	1
1 to 3 months	2	4	–	1	7
3 to 6 months	2	1	–	–	3
6 to 12 months	1	–	1	–	2
1 to 2 years	1	–	–	–	1
Over 2 years	1	–	3	–	4
Totals	7	6	4	1	18

TABLE 6.— *Causes of Death*

	Adults		Children		
	Males	Females	Males	Females	Total
Tuberculosis:					
Of intestines and peritoneum	–	3	–	1	4
Of the vertebral column	1	–	–	–	1
Of the bones and joints (vertebral column excepted)	1	1	1	–	3
Of the lymphatic system (bronchial mesenteric and retroperitoneal glands excepted)	–	1	–	–	1
Of the genitourinary system	1	–	2	–	3
Other tuberculous conditions	3	1	–	–	4
Other causes	1	–	1	–	2
Total	7	6	4	1	18

TABLE 7.— *Outpatient Examinations*

New patients seen	66
Old cases	208
Number of visits	273
Diagnoses made (new patients):	
Negative for tuberculosis	58
Suspicious lesion	1
Extrapulmonary tuberculosis	3
Pulmonary tuberculosis	3
Anterior poliomyelitis	1

TABLE 8.— *Surgical Operations*

*Tuberculosis Patients**

Amputations	3	Tonsillectomies	12
Arthrodeses	32	All other operations	7
Exploratory laparotomies	1		66
Incisions for drainage	3		
Nephrectomies	3	Cystoscopies	36
Other kidney operations	5	Transfusions	31

*Of these operations, 9 were performed at the Baker Memorial Hospital in Boston.

Poliomyelitis Patients

Muscle transplants*	23	All other operations	26
Stabilizations*	26		87
Stabilizations and muscle transplants	10		
Tonsillectomies	2	Transfusions	8

*Including other procedures such as plastics and tenotomies done at the same time.

Employees

Major abdominal operations	3	Cystocopies	1
All other operations	1		
	4		

Casts

Boots	47	Shells	66
Buckets	2	Spicas	78
Cylinders	101	Splints	69
Jackets	154	Reinforcements	82
Moulds	14		613

Respectfully submitted,

CLAIRE W. TWINAM, M.D.,
Acting Superintendent.

NORTH READING STATE SANATORIUM

CARL C. MACCORISON, M.D., *Superintendent*

TO PAUL J. JAKMAUH, M.D., *Commissioner of Public Health:*

I have the honor of submitting the summary of activities of the North Reading State Sanatorium for the year ending November 30, 1941.

TABLE 1.— *Admissions and Discharges*

	Males	Females	Total
Patients in Sanatorium November 30, 1940	106	124	230
Patients admitted from December 1, 1940, to November 30, 1941, inclusive	58	56	114
Patients discharged from December 1, 1940, to November 30, 1941, inclusive	87	71	138
Patients remaining in Sanatorium November 30, 1941	77	109	186
Deaths	6	8	14
Daily average number of patients	89.8	122.4	212.1

TABLE 2 — *Diagnosis and Stage of Disease on Admission*

	Males	Females	Total	Percentage
Primary phase tuberculosis	26	18	44	38.6
Minimal	3	8	11	9.6
Moderately advanced	2	7	9	7.9
Advanced	3	10	13	11.4
Miliary tuberculosis	1	–	1	.9
Tuberculous pleurisy with effusion	2	3	5	4.4
Tuberculous peritonitis	1	–	1	.9
Bronchiectasis	1	1	2	1.8
Lung abscess	2	2	4	3.5
Convalescent postoperative empyema	–	1	1	.9
Tuberculous cervical adenitis	1	1	2	1.8
Undernourished	1	–	1	.9
Nontuberculous	5	1	6	5.2
Observation	4	3	7	6.1
Deferred	6	1	7	6.1
Total	58	56	114	100.0

TABLE 3.— *Ages of Patients Admitted*

	Males	Females	Total	Percentage
Under 5 years	23	10	33	29.0
5 to 9 years	11	11	22	19.3
10 to 14 years	15	23	38	33.3
15 to 19 years	9	12	21	18.4
Total	58	56	114	100.0
Average age	7.7	10.4	9.1	.....

TABLE 4.— *Condition on Discharge*

	Males	Females	Total	Percentage
Apparently well	14	5	19	12.0
Arrested	49	25	74	46.8
Apparently arrested	5	12	17	10.8
Quiescent	4	9	13	8.2
Improved	5	9	14	8.9
Unimproved	4	3	7	4.4
Died	6	8	14	8.9
Total	87	71	158	100.0

TABLE 5.— *Deaths by Length of Residence in Sanatorium*

	Males	Females	Total
Less than 1 month	1	–	1
1 to 3 months	1	4	5
3 to 6 months	3	1	4
6 to 12 months	–	2	2
1 to 2 years	1	1	2
Over 2 years	–	–	–
Total	6	8	14

TABLE 6.— *Causes of Death*

	Males	Females	Total
Tuberculosis of lungs	3	6	9
Tuberculous meningitis	1	–	1
Miliary tuberculosis	1	1	2
Tuberculosis of peritoneum	–	1	1
Bronchiectasis	1	–	1
Total	6	8	14

TABLE 7.— *Clinic Examinations*

	Consultation Clinics	Out-Patients	Total
New patients seen	322	917	1239
Old cases	413	1143	1556
Number of visits	786	2217	3003
Diagnoses made (new patients):			
Pulmonary tuberculosis	22	21	43
Pulmonary tuberculosis suspect	48	118	166
Primary tuberculosis	2	2	4
Primary tuberculosis suspect	11	32	43
Extrapulmonary tuberculosis	–	1	1
Contact with negative X-ray	87	101	188
Negative for tuberculosis	152	643	795
Total	322	917	1239

Respectfully submitted,

CARL C. MACCORISON, M.D.,
Superintendent.

RUTLAND STATE SANATORIUM

ERNEST B. EMERSON, M.D., *Superintendent*

To PAUL J. JAKMAUH, M.D., *Commissioner, Department of Public Health:*

I have the honor to submit the summary of activities of the Rutland State Sanatorium for the year ending November 30, 1941.

TABLE 1.— *Admissions and Discharges*

	Males	Females	Total
Patients in Sanatorium November 30, 1940	147	128	275
Patients admitted from December 1, 1940, to November 30, 1941, inclusive	153	115	268
Patients discharged from December 1, 1940, to November 30, 1941, inclusive	142	119	261
Patients remaining in Sanatorium November 30, 1941	158	124	282
Deaths	36	29	65
Daily average number of patients	150.6	136.8	287.4

TABLE 2.— *Diagnosis and Stage of Disease on Admission*

	Males	Females	Total	Percentage
Minimal	15	15	30	11.2
Moderately advanced	36	35	71	26.5
Far advanced	92	54	146	54.4
Unclassified	7	3	10	3.7
Tuberculous pleurisy	–	2	2	.7
Carcinoma of lung	1	–	1	.4
Chronic myocarditis	–	1	1	.4
Pleurisy with effusion	1	2	3	1.1
Empyema	–	1	1	.4
Anthracosis	1	–	1	.4
Arteriosclerosis	–	1	1	.4
Bronchiectasis	–	1	1	.4
Total	153	115	268	

TABLE 3.— *Ages of Patients Admitted*

	Males	Females	Total	Percentage
Under 20 years	10	8	18	6.7
20 to 29 years	31	47	78	29.1
30 to 39 years	38	42	80	29.8
40 to 49 years	36	4	40	14.9
50 to 59 years	27	9	36	13.6
60 to 69 years	7	5	12	4.4
70 years and over	4	–	4	1.5
Total	153	115	268	
Average age	39.4	32.2	36.4	

TABLE 4.— *Condition on Discharge*

	Males	Females	Total	Percentage
Arrested	4	5	9	3.5
Apparently arrested	3	6	9	3.5
Quiescent	62	44	106	40.6
Improved	14	10	24	9.2
Unimproved	10	15	25	9.6
Not considered	4	4	8	3.1
Nontuberculous	9	6	15	5.7
Dead	36	29	65	24.8
Total	142	119	261	100.0

TABLE 5.— *Deaths by Lengths of Residence*

	Males	Females	Total
Under 1 month	5	3	8
1 to 3 months	6	8	14
3 to 6 months	9	6	15
6 to 12 months	6	6	12
1 to 2 years	7	4	11
Over 2 years	3	2	5
Total	36	29	65

TABLE 6.— *Causes of Death*

	Males	Females	Total
Pulmonary tuberculosis	28	22	50
Pulmonary tuberculosis and diabetes mellitus	–	2	2
Peritoneal tuberculosis and pulmonary tuberculosis	–	1	1
Pulmonary tuberculosis and intestinal tuberculosis	1	1	2
Pulmonary tuberculosis and laryngeal tuberculosis	2	1	3
Pulmonary tuberculosis and acute laryngitis	1	–	1
Chronic myocarditis	–	1	1
Carcinoma of lung	1	–	1
Pulmonary tuberculosis, tuberculous pleurisy, and peritoneal tuberculosis	1	–	1
Pulmonary tuberculosis, intestinal tuberculosis, and amyloidosis of liver and spleen	1	–	1
Arteriosclerotic heart disease, pulmonary fibrosis, and broncho-pneumonia	1	–	1
Pulmonary tuberculosis, intestinal tuberculosis, and rheumatic heart disease	–	1	1
Total	36	29	65

TABLE 7.— *Clinic Examinations*

	Consultation Clinics	Outpatients	Total
New patients seen	493	368	861
Old cases	282	368	650
Number of visits	775	736	1,511
Diagnoses made (new patients):			
Negative for tuberculosis	339	348	687
Pulmonary tuberculosis	15	10	25
Tuberculosis suspect	132	7	139
Primary phase tuberculosis	7	3	10

TABLE 8.— *Surgical Operations*

Appendectomies	8
Other abdominal operations	10
Tonsillectomies	8
Other minor operations	14
Phrenic emphraxis	2
Bronchoscopies	94
Cystoscopies	4
Blood transfusions	2
Artificial pneumothorax refills	4,988
Aspirations of pleural cavity	185
Total number of inpatients receiving pneumothorax during the year	152
Total number of inpatients receiving pneumothorax at the end of the year	106
Total number of outpatients given pneumothorax during the year	116
Total number of outpatients receiving pneumothorax at the end of the year	75

The following were performed at the Massachusetts General Hospital: 34 thoracoplasties, 14 apicolyses, 1 bronchoscopy, 1 phrenicotomy, and 1 plombage-paraffin.

Respectfully,

ERNEST B. EMERSON, M.D.,
Superintendent.

WESTFIELD STATE SANATORIUM

ROY MORGAN, M.D., *Superintendent*

To PAUL J. JAKMAUH, M.D., *Commissioner, Department of Public Health:*

I have the honor to submit the summary of activities of the Westfield State Sanatorium for the year ending November 30, 1941.

TABLE 1.—*Admissions and Discharges*

Tuberculosis Patients

	Males	Females	Totals
Patients in Sanatorium November 30, 1940	67	102	169
Patients admitted from December 1, 1940, to November 30, 1941, inclusive	88	84	.172
Patients discharged from December 1, 1940, to November 30, 1941, inclusive	78	93	171
Patients remaining in Sanatorium November 30, 1941	77	93	170
Deaths	19	14	33
Daily average number of patients	75.3	98.5	173.8

Cancer Patients

Patients in hospital November 30, 1940	18	25	43
Patients admitted from December 1, 1940, to November 30, 1941, inclusive	311	355	666
Patients discharged from December 1, 1940, to November 30, 1941, inclusive	309	363	672
Patients remaining in hospital November 30, 1941	20	17	37
Deaths	38	23	61
Daily average number of patients	20.5	20.2	40.7

Total of Tuberculosis and Cancer Patients

Patients in Sanatorium November 30, 1940	85	127	212
Patients admitted from December 1, 1940, to November 30, 1941, inclusive	399	439	838
Patients discharged from December 1, 1940, to November 30, 1941, inclusive	387	456	843
Patients remaining in Sanatorium November 30, 1941	97	110	207
Deaths	57	37	94
Daily average number of patients	95.8	118.7	214.5

Cancer Readmissions

Total patients treated	329	380	709
Less old patients readmitted first time since December 1, 1940	42	59	101
Less other readmissions	46	38	84
Less patients in hospital December 1, 1940	18	25	43
New patients admitted from December 1, 1940 to November 30, 1941	223	258	481
Total number of different patients treated December 1, 1940 to November 30, 1941	283	342	625

TABLE 2.— *Diagnosis and Stage of Disease on Admission*

Tuberculosis

	Males	Females	Total	Percentage
Advanced	44	35	79	45.9
Advanced with diabetes	3	3	6	3.5
Advanced with silicosis	2	–	2	1.2
Advanced with pleurisy with effusion	1	–	1	.6
Minimal	8	12	20	11.6
Minimal with pleurisy with effusion	1	1	2	1.2
Minimal with pregnancy	–	1	1	.6
Moderately advanced	15	21	36	20.9
Moderately advanced with pregnancy	–	1	1	.6
Pleurisy with effusion	–	1	1	.6
No evidence of tuberculosis	3	1	4	2.3
Unclassified	11	8	19	11.0
Total	88	84	172	100.0

Cancer

Early	15	37	52
Moderately Advanced	40	41	81
Advanced	121	87	208
Non-malignant	47	93	140
Total	223	258	481

TABLE 3.— *Ages of New Patients Admitted*

Tuberculosis

	Tuberculosis			Cancer			Combined Total
	Males	Females	Total	Males	Females	Total	
Under 20 years	4	11	15	6	1	7	22
20 to 29 years	25	30	55	6	8	14	69
30 to 39 years	17	21	38	9	23	32	70
40 to 49 years	16	13	29	29	68	97	126
50 to 59 years	14	6	20	62	83	145	165
60 to 69 years	10	3	13	61	43	104	117
70 to 79 years	2	–	2	43	25	68	70
80 to 89 years	–	–	–	7	7	14	14
Total	88	84	172	223	258	481	653

TABLE 4.— *Condition of Patients Discharged*

Tuberculosis

	Males	Females	Totals	Percentages
Apparently arrested	29	33	62	36.3
Quiescent	4	10	14	8.2
Improved	8	22	30	17.5
Unimproved	15	11	26	15.2
Died	19	15	34	19.9
No evidence of tuberculosis	3	2	5	2.9
Total	78	93	171	100.0

Cancer

Improved	198	266	464	69.0
Unimproved	73	74	147	21.9
Died	38	23	61	9.1
Totals	309	363	672	100.0

TABLE 5.— *Deaths by Length of Residence in Sanatorium*

Tuberculosis Patients

	Males	Females	Totals
Under 1 month	2	4	6
1 to 3 months	7	1	8
3 to 6 months	4	5	9
6 to 12 months	3	2	5
1 to 2 years	3	1	4
Over 2 years	–	2	2
Total	19	15	34

TABLE 6.— *Causes of Death*

Tuberculosis Patients

	Males	Females	Totals
Pulmonary tuberculosis	14	11	25
Pulmonary tuberculosis and silicosis of lungs	1	–	1
Pulmonary tuberculosis, tuberculous laryngitis, enteritis, tracheitis	1	–	1
Pulmonary tuberculosis, intestinal tuberculosis, hemangioma left forearm	–	1	1
Pulmonary tuberculosis, carcinoma of bladder, asthma	1	–	1
Pulmonary tuberculosis, pericardial effusion, arteriosclerotic heart disease	–	1	1
Pulmonary tuberculosis, tuberculosis of pelvis, rheumatic heart disease	–	1	1
Tuberculous meningitis, pulmonary tuberculosis	1	–	1
Tuberculous meningitis, miliary tuberculosis	–	1	1
Undiagnosed malignant tumor	1	–	1
Total	19	15	34

TABLE 7.— *Clinic Examinations*

Tuberculosis

	Consultation Clinics	Out-Patients	Total
New patients seen	743	2,544	3,287
Old patients seen	99	3,443	3,542
Number of visits	1,110	4,441	5,551
Diagnosis made (new patients):			
Negative for tuberculosis	683	2,306	2,989
Pulmonary tuberculosis	17	117	134
Tuberculosis suspect	27	121	148
Unsatisfactory films	16	–	16

Cancer

Visits to regular Wednesday clinics	3,975
Average attendance	80
New patients seen	1,186
Visits exclusive of Wednesday clinics	2,419
Total clinic visits	6,394

TABLE 8.— *Surgical Report*

Tuberculosis

Thoracoplasties:		Thoracoscopies	2
First stage	8	Open thoracotomy	1
Second stage	6	Drainage of empyema	1
Third stage	3	Bronchoscopies	15
Fourth stage	1	Appendectomies	2
Phrenic crushings	4	Biopsies	6
Extra-pleural pneumolysis	3	Cystoscopies	6
Intra-pleural pneumolysis	63	Minor operations	32
Open pneumolysis	1		
Total			154
Artificial pneumothorax treatments			6,107

Cancer

Major operations	310	Procedures without anesthetics	540
Minor operations	370	X-ray treatments	6993
Biopsies	636	Radium treatments	77
Endoscopies	505	X-ray films exposed for diagnosis	4935
Anesthetics given	1472		

Respectfully submitted,

ROY MORGAN, M.D.,
Superintendent.

PONDVILLE HOSPITAL

GEORGE L. PARKER, M.D., *Superintendent*

To PAUL J. JAUKMAUH, M.D., *Commissioner, Department of Public Health:*

I have the honor to submit the summary of activities of the Pondville Hospital, for the year ending November 30, 1941.

TABLE 1. *Admissions and Discharges*

	Males	Females	Total
Patients in hospital December 1, 1940	53	47	100
Patients admitted from December 1, 1940 to November 30, 1941	629	755	1,384
Patients discharged from December 1, 1940 to November 30, 1941	636	751	1,387
Patients remaining in hospital November 30, 1941	46	51	97
Deaths	83	67	150
Daily average number of patients	55.9	56.1	112

TABLE 2.— *Readmissions*

	Males	Females	Total
Total patients treated	682	802	1,484
Less old patients readmitted first time since December 1, 1940	121	139	260
Less other readmissions	124	124	248
Less patients in hospital December 1, 1940	53	47	100
Number new patients admitted from December 1, 1940 to November 30, 1941	384	492	876
Total number of different patients treated from December 1, 1940 to November 30, 1941	558	678	1,236

TABLE 3.— *Ages of New Patients Admitted*

	Males	Females	Total
Under 20 years	9	6	15
20 to 29 years	3	22	25
30 to 39 years	17	52	69
40 to 49 years	25	110	135
50 to 59 years	86	117	203
60 to 69 years	124	104	228
70 to 79 years	89	67	156
80 to 89 years	31	12	43
90 to 99 years	2	–	2
Unknown age	–	–	–
Totals	386	490	876

TABLE 4.— *Stage of Disease of New Patients Admitted*

	Males	Females	Total
Early	65	62	127
Moderately advanced	106	109	215
Advanced	129	111	240
Non-malignant	82	202	284
No diagnosis	–	2	2
Pending	4	4	8
Totals	386	490	876

TABLE 5.— *Condition of Patients Discharged*

	Males	Females	Total
Improved	411	551	962
Unimproved	144	131	275
Died	83	67	150
Totals	638	749	1,387

TABLE 6.— *Clinic Examinations*

Visits to regular Thursday clinics	4,691
Average attendance	92
New patients seen	1,121
Visits exclusive of Thursday clinics	2,959
Total clinic visits	7,650

TABLE 7.— *Surgical Report*

Operations	1162	Anesthetics given	1,870
Biopsies	489	X-ray treatments	13,114
Endoscopies	447	Radium treatments	372
Transfusions	417		

Respectfully submitted,

GEORGE L. PARKER, M.D.,
Superintendent.

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Public Document No. 34

The Commonwealth of Massachusetts

ANNUAL REPORT

OF THE

DEPARTMENT OF PUBLIC HEALTH

FOR THE

YEARS 1942 THROUGH 1949

The Commonwealth of Massachusetts

ANNUAL REPORT

OF THE

DEPARTMENT OF PUBLIC HEALTH

FOR THE

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PUBLICATION OF THIS DOCUMENT APPROVED BY GEORGE J. CRONIN, STATE PURCHASING AGENT
1M-8-50-902664

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MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

1949

Commissioner of Public Health, Vlado A. Getting, M.D., Dr.P.H.

Public Health Council

William H. Griffin, M.D.
Gordon Hutchins
Paul Jakmauh, M.D.
Francis H. Lally, M.D.
Raymond L. Mutter
Charles F. Wilinsky, M.D.

Florence L. Wall, *Secretary*

Division of Administration	Under direction of Commissioner
Division of Tuberculosis	*Director and First Deputy Commissioner* Alton S. Pope, M.D.
Division of Local Health Administration	*Director* and *Second Deputy Commissioner,* Robert E. Archibald, M.D.
Division of Sanitary Engineering	*Director* and *Third Deputy Commissioner* Clarence I. Sterling, C.E.
Division of Biologic Laboratories	*Director,* Geoffrey Edsall, M.D.
Division of Cancer and Other Chronic Diseases	*Director,* Herbert L. Lombard, M.D.
Division of Communicable Diseases	*Director,* Roy F. Feemster, M.D.
Division of Dental Health	*Director,* William D. Wellock, D.M.D.
Division of Food and Drugs	*Director,* Carl S. Ferguson, B.S.
Division of Hospitals	*Director,* Richard P. MacKnight, M.D.
Division of Maternal and Child Health	*Director,* Florence L. McKay, M.D.
Division of Venereal Diseases	*Director,* Nicholas J. Fiumara, M.D.

First Assistant to the Commissioner, Loren D. Moore, M.D.

State District Health Officers

Southeastern District	Harold W. Stevens, M.D.
South Metropolitan District	Autino Fiore, M.D.
North Metropolitan District	Robert E. S. Kelley, M.D.
Northeastern District	Walter J. Pennell, M.D.
South Central District	Arthur E. Burke, M.D.
North Central District	Arthur E. Burke, M.D.
Connecticut Valley District	Walter W. Lee, M.D.
Berkshire District	Charles E. Gill, M.D.

Institutions and Superintendents

Lakeville State Sanatorium	Leon A. Alley, M.D.
North Reading State Sanatorium	Claire W. Twinam, M.D.
Rutland State Sanatorium	Paul Dufault, M.D.
Westfield State Sanatorium	Wilson W. Knowlton, M.D.
Pondville Hospital	George L. Parker, M.D.

The Commonwealth of Massachusetts

CONSOLIDATED REPORT
OF THE
DEPARTMENT OF PUBLIC HEALTH OF MASSACHUSETTS
FOR THE
Years 1942 through 1949

REPORT OF PUBLIC HEALTH COUNCIL FOR THE YEARS 1942 THROUGH 1949

The Department of Public Health as defined in General Laws, Chapter 17, Section 1, consists of the commissioner of public health and the public health council, the commissioner serving ex officio as chairman. Following is the membership of the Public Health Council during the period covered by this Report:

Commissioner of Public Health

Paul J. Jakmauh, M.D.	1938 – 1943
Vlado A. Getting, M.D., Dr. P.H.	1943 –

Public Health Council

Richard P. Strong, M.D.	1921 – 1943
James L. Tighe, C.E.	1923 – 1947
Francis H. Lally, M.D.	1924 –
Gordon Hutchins	1926 – 1937
	1940 –
Richard M. Smith, M.D.	1934 – 1949
R. Nelson Hatt, M.D.	1940 – 1942
Cecil K. Drinker, M.D.	1943 – 1946
Elmer S. Bagnall, M.D.	1943 – 1945
George L. Schadt, M.D.	1942 – 1943
William H. Griffin, D.M.D.	1945 –
Charles F. Wilinsky, M.D.	1946 –
Raymond L. Mutter	1947 –
Paul J. Jakmauh, M.D.	1949 –

Regular monthly meetings of the Public Health Council have been held as required by General Laws, Chapter 17, Section 3, as amended. In addition, special meetings were held from time to time, as a result of which the Council visited practically every county to become as familiar as possible with all public health activities in the Commonwealth. Since 1947 members of the Council have regularly attended the annual Massachusetts Public Health Conference at the University of Massachusetts, Amherst. Several meetings were held at the Department's institutions where opportunity was provided for inspection of the institution facilities. Joint meetings were held with the State Advisory Council for the Administration of the Hospital Survey and Construction Act to consider applications for financial assistance in the construction of hospitals, health centers or teaching facilities.

The Council has carried out its regular duties as imposed by General Laws, Chapter III, Section 3, and other laws. Prior to the passage of Chapter 152 of the Acts of 1946, all public hearings were held before the Commissioner and Public Health Council, but under authority of this act the Department in some instances has authorized division directors to hold hearings with the understanding that a report will be presented for consideration at the next meeting of the Department.

An entirely new activity, delegated to the Department by Chapter 661 of the Acts of 1941, was the licensing of hospitals and sanatoria. Under authority of this act, on April 14, 1942 "Hospital Standards" were adopted by the Department as minimum requirements for the licensing of hospitals and sanatoria. Chapter 618 of the Acts of 1948 assigned to the Department the licensing of convalescent and nursing homes and boarding homes for the aged, and on November 3, 1948, rules and regulations governing the licensing of these homes were adopted by the Department.

With regret the death on April 6, 1947 of Mr. James L. Tighe of Holyoke is reported. Mr. Tighe served the Department faithfully as a member of the Public Health Council from 1923 until his death at the age of 82. As one of the outstanding consulting engineers of the United States, his advice and counsel on sanitary engineering matters in particular and public health work in general have proved of inestimable value to the Department, and his contributions to the furtherance of the protection of the public health in Massachusetts have been outstanding.

With regret also we report the deaths of Dr. Richard P. Strong, a faithful member of the Public Health Council from 1921 to 1943, whose successful work in the field of tropical medicine was outstanding, and of Dr. R. Nelson Hatt, a member of the Public Health Council from 1940 to 1942, who, because of his untiring efforts in behalf of crippled children made significant contributions to the development of the Department's program in this field.

CONSOLIDATED REPORT OF THE COMMISSIONER OF PUBLIC HEALTH

To the Public Health Council:

Gentlemen: Due to war restrictions, the Department did not print annual reports for the years 1942 through 1949. This report is a consolidation of pertinent information, along with the morbidity, mortality and statistical data for these years.

Chapter 292 of the Acts of 1945 required that the annual report of the Department be made on the basis of a fiscal year beginning July 1 and ending June 30 of the following calendar year, rather than on the basis of a calendar year. The 1945 report, therefore, covers a six-month period, January 1 through June 30 and does not contain any morbidity and mortality report. All of the subsequent annual reports based on the fiscal year will contain morbidity and mortality data for the preceding calendar year.

An item of particular importance during this period was the celebration of the 75th Anniversary of the Department during 1944. These activities were concluded with a banquet given by His Excellency, the Governor, on December 6, 1944.

War Activities

During the war and in the immediate post war years, the Department, along with the Armed Forces, developed plans to safeguard the public water supplies in the Commonwealth; to decontaminate areas contaminated by war gas; to train chemists and bacteriologists to identify war gases and to detect pollution of water mains following bombing and other enemy action; to study the public health aspects of lowered room temperature due to fuel conservation and make recommendation to the citizens of the Commonwealth; to control communicable diseases within the state, particularly in the extra-cantonment areas, and to observe and follow-up discharged service personnel returned to the Commonwealth with tropical diseases.

Co-operating with the Massachusetts Committee on Public Safety, plans were made to use the state and county sanatoria as "base hospitals" for the evacuation of patients from general hospitals in cities and towns.

Plans were developed with state and Federal agencies for the care of young children of mothers employed in war industries, and the Emergency Maternal and Infant Care Program was begun in Spetember, 1943.

Approving Authority for Medical Schools

In 1943, the Board inspected the Middlesex University Medical School and premedical courses, and considered the findings and reported to the Middlesex authorities the steps that should be taken by them to obtain approval of their school. A reinspection of this school was made in 1944, and after a public hearing, approval was denied. This case was appealed to the Suffolk Superior Court, and Judge Charles Cabot returned a decision upholding the Approving Authority in refusing to give approval to Middlesex University Medical School.

Section 2, Chapter 112, General Laws, amended by Chapter 396 of the Acts of 1945, expanded the Approving Authority to include not only the Secretary of the Board of Registration in Medicine, the Commissioner of Education and the Commissioner of Public Health, but also the osteopathic member of the Board of Registration in Medicine and a layman.

During the years, the Approving Authority held hearings with reference to approving certain medical schools, whereby graduates could become candidates for registration to practice medicine in the Commonwealth.

Rating Board

The Commissioner, as Chairman of the Rating Board, presided over hearings at which applicants from the Department of Public Safety were interviewed, the applications were investigated, reviewed and passed upon for retirement because of illness or injuries sustained in line of duty.

Milk Regulation Board

In 1943, the forms used for the inspection of milk were revised, and by an agreement with the local milk inspectors and restauranteurs, arrangements were made for the display of placards to inform the consumer that mixtures of milk and cream were being used in lieu of cream.

During 1944, the principle concern was the admission of milk into the state because of a shortage in the local supply. In 1946, the Board considered the alleged milk shortages in the Commonwealth, but in no instance was a shortage determined to be in existence. On evidence presented by milk dealers, the Board declared that an emergency milk shortage existed from October 23, 1947 to March 4, 1948. During this period, the Director of the Division of Dairying and Animal Husbandry, Department of Agriculture, was authorized to issue permits to Massachusetts dealers and distributors for the importation of uninspected milk.

On June 8, 1946, Chapter 496 of the General Laws, relieved the Commissioner of Public Health as Chairman of the Board and designated the Chairman of the Milk Control Board as Chairman of the Milk Regulation Board. The act further authorized the Commissioner of Public Health to designate an individual to represent him on the Board, and the Director of the Division of Food and Drugs was so designated.

After public hearings during 1947, the Board adopted new regulations pertaining to milk plants, to pasteurization plants, and to the transportation of milk located outside of the Commonwealth and these regulations became effective July 1, 1948.

During the fiscal year 1949, regulations relative to the grades of milk were revised by the Board and were approved by the Governor and Council.

State Planning Board

The Commissioner, or his representative from the Division of Sanitary Engineering, has been active in the Board's post war planning for the Commonwealth. Plans were discussed and developed for community planning; housing; industrial activities; flood control and harbor improvements; the development of recreational areas, including ocean beaches; vehicle traffic and rapid transit improvement in Boston and the Metropolitan district, and further development of the Logan National Airport and air programs for all sections of the Commonwealth.

Special Projects

Chapter 37, of the Resolves of 1941, directed the Department to study the eradication and control of ragweed in the Commonwealth. The results of this survey indicated that eradication of this weed would require a large, long-range program, and such an expensive and time-consuming project could not be considered at this time.

The cooperative project with the Massachusetts General Hospital for the investigation and treatment of arthritic patients has been continued. It is hoped that this project will provide information for better treatment and rehabilitation of those individuals suffering from this chronic disease.

New Projects

Plans for the development of a state-wide whole blood, plasma and plasma fractionation program were begun in 1944 and provided for the donation of blood by volunteers and the processing and distribution of blood and blood products from the Division of Biologic Laboratories. The American Red Cross had charge of donor procurement in this program. The Godfrey M. Hyams Foundation provided funds for the construction of a new addition to the Biologic Laboratories at Forest Hills to be used for the processing, storage and distribution of whole blood and the fractionation of blood plasma and the subsequent distribution of the blood derivatives.

In 1947 and 1948, the Division of Biologic Laboratories was relieved of a good part of the blood program by the American Red Cross. The division provided certain laboratory services at cost for the Red Cross, and the fractionation laboratory assisted in developing new agents and improving established procedures for the blood program. During the fiscal years 1948 and 1949, the American National Red Cross completely absorbed the Massachusetts Blood Program into the Red Cross National Blood Program. The laboratory continued to provide facilities and per-

sonnel for some of the activities and research and special studies, which were financed on a cost basis by the Red Cross.

In 1944, a state-wide Rheumatic Fever Program, recommended by the Department, was approved in principle by the Massachusetts Medical Society. Chapter 453 of the Acts of 1945, provided for the hospitalization of rheumatic fever patients in the North Reading Sanatorium.

In 1945, the Legislature authorized the expenditure of 250 thousand dollars for plans for an 800 bed chronic disease hospital, and architects were employed to draw up detailed plans.

In 1946, the Department received an appropriation of 7 million dollars for the construction of this hospital, but the appropriation lapsed because the bond issue was not floated in 1947.

By authority contained in Chapter 770 of the Acts of 1949, the location of the hospital was changed from the Middlesex Fells area immediately adjacent to the New England Sanatorium to land donated by the City of Boston in Franklin Park on Morton Street, Jamaica Plain.

Chapter 790 of the Acts of 1949 provided 11 million dollars for the construction of the chronic disease hospital, but the size of the hospital was reduced from 800 to 600 beds.

Departmental Reorganization

Since the last reorganization of the Department in 1917, the activities have more than doubled. New offices and new divisions have been created without complete coordination within the Department. Certain arrangements, originally beneficial, through the passage of years have proved no longer of value, and it was deemed desirable to make alterations in these arrangements.

Chapter 661 of the Acts of 1941, delegated to the Department the licensing of hospitals and sanatoria. With the assistance of an advisory committee, minimum standards were established and rules and regulations promulgated.

On January 7, 1942, a Public Health Nursing unit was created in the Division of Administration by the transfer of personnel and activities from the Division of Child Hygiene. A nurse was assigned to each of the District Health offices to function as supervising nurse and act as consultant to the District Health Officer.

In 1942, a dental unit was established in the Division of Administration to coordinate the dental activities of the Department with Federal local public and private agencies in the field for further education in the promotion of dental health.

Chapter 16 of the Acts of 1943 authorized the Department to license dental clinics similar to the licensing of medical clinics throughout the Commonwealth.

In 1944, the Public Health Council changed the name of the Division of Hygiene to the Division of Maternal & Child Health, and that of the Division of Adult Hygiene to the Division of Cancer & Other Chronic Diseases, and effective July 1, 1945, the name of the Division of Genitoinfectious Diseases was changed to the Division of Venereal Diseases.

The creation of the new Division of Local Health Administration, with the transfer of certain activities from the Divisions of Administration, Communicable Disease Maternal & Child Health, and the creation of new Bureaus of Dental Health, Public Health Nursing, Nutrition, Social Service and Sanitary Inspection were made in 1944.

The Wassermann Laboratory was transferred from the Division of Biologic Laboratories to the Division of Communicable Diseases during 1944. Personnel from the Maternal & Child Health Division was transferred to the Division of Administration to create a Bureau of Health Information. The Bureau of Crippled Children's Services was transferred to the Division of Maternal & Child Health.

Chapter 527 of the Acts of 1945, in amending Chapter 661 of the Acts of 1941, enabled building inspectors of the Department of Public Safety to issue a certificate of acknowledgement for a period of 90 days until an inspection with recommendations or changes was made. The Department of Public Health requested a change in the law so that the Department, acting upon the acknowledgement issued by the Department of Public Safety, could issue a certificate of acknowledgement for the

same period of time as that issued by the Department of Public Safety. If and when the hospital obtained approval from the Department of Public Safety and other papers were in order, then the Department would issue a license to the hospital.

In 1945, His Excellency, the Governor, appointed a State Advisory Committee on Hospitals and Health Centers, with the Commissioner, Department of Public Health, serving as Chairman. This Committee surveyed the hospitals and health centers of the Commonwealth under authority contained in Section 2 of Chapter 736 of the Acts of 1945. The data collected were analyzed by the Commission on Hospital Care, Chicago, Illinois. No state matching funds were appropriated for the fiscal year beginning July 1, 1947, which prevented the Commonwealth from qualifying for grants under Public Law 725, the Hospital Survey and Construction Act. However, the state plan for the administration of Public Law 725, prepared and submitted during the fiscal year 1947-48, was approved by the Public Health Service on December 2, 1947. The construction on the first project began on June 14, 1948.

In 1946, the Department re-introduced a bill in the Legislature for the licensing of convalescent and nursing homes. A Resolve, Chapter 71, of the Acts of 1946, provided for a study by a joint board, consisting of the Departments of Public Health, of Public Welfare and of Public Safety, relative to the regulation of certain hospitals, sanatoria, convalescent and nursing homes by the Department of Public Health.

Chapter 618 of the Acts of 1948, transferred from the Department of Public Welfare to the Department of Public Health the licensing of convalescent and nursing homes and boarding homes for the aged, to be effective in September, 1948. This new service was taken over by hospital licensing and carried out by the Division of Hospitals.

In 1948, plans were developed to consolidate the Bureau of Hospital Licensing and the newly organized Division of Hospital Survey & Construction into a Division of Hospitals, effective July 1, 1948.

In 1947, with the appointment of a Chief Co-ordinator for the Bureau of Health Information and the transfer of health education personnel from the divisions and from some of the district offices, the establishment of the Bureau of Health Information in the Division of Administration was accomplished. This provided a generalized health education program emanating from a central service bureau.

Personnel

By 1943, over 200 employees of the Department had entered the Armed Forces, and this necessitated many temporary appointments and promotions. The loss of personnel seriously undermined both the state hospitals and sanatoria and the central offices, but all routine work, together with extra war activities, was carried on by the extended effort of those remaining.

Studies by the Department have indicated that the low salary range in the Commonwealth as compared to other state departments was a prime factor in the loss of personnel and the inability to obtain replacements. The Department recommended that Civil Service regulations be liberalized to permit employment of out-of-state qualified professional personnel when this practice was beneficial to the state. The Department also recommended preparation of a classification schedule of all personnel, with recommendations for increases in salaries. The reclassification of personnel was made in the interest of simplification of titles and more equitable compensation for the services rendered. In 1947, Legislature passed legislation providing for reclassification of physicians and provided for some salary increases for physicians.

In 1944, the Department introduced legislation for authority to designate one or more, but not more than three Division Directors as Deputy Commissioners. Section 1, Chapter 323, of the Acts of 1948, gave the Commissioner authority to designate two additional Deputy Commissioners. The Director, Division of Tuberculosis and Sanatoria was designated as the first Deputy Commissioner by Section 5, Chapter 111 of the General Laws. The Director, Division of Local Health Administration was designated as the second Deputy Commissioner, and the Director of the Division of Sanitation was designated as the third Deputy Commissioner.

Department Quarters

The new public health programs and the expansion of the Department activities have materially increased over the past several years. These changes have increased the number of employees and brought about the need for additional office space. However, during this period, there has been very little opportunity to increase the office space in the State House, which totals about 34,000 square feet. Due to the lack of space and the crowding in the State House, it has been necessary to rent approximately 18,000 square feet on the outside. None of the offices provide adequate and safe storage space for records, most offices are overcrowded and are unsuited for the needs of the Department. Several attempts have failed to obtain more adequate office space for the Department because of the war restrictions and the inability to find a suitable building. Plans and changes are still being made for additional office space, and it is hoped that eventually all of the Department, with the exception of the Biologic Laboratories, the Diagnostic Laboratory, the Lawrence Experimental Station and the Westfield Laboratory will be housed in a new building especially designed for the needs.

The heavy statistical machinery, the need for the adequate storage facilities and the protection of morbidity and mortality records, the necessity for interdepartmental conferences and planning, and the availability of the various departments for professional and lay visitors to the Department adequately justify a new building designed especially for the needs of the Department.

Respectfully submitted,

Vlado A. Getting, M.D.,
Commissioner of Public Health

William H. Griffin
Gordon Hutchins
Francis H. Lally
Raymond L. Mutter
Paul J. Jakmauh
Charles F. Wilinsky

Public Health Council

Expenditures — Department of Public Health

December 1, 1941 — June 30, 1949

	Fiscal Year Ended Nov. 30, 1942	Fiscal Period Ended June 30, 1943	Fiscal Year Ended June 30, 1944	Fiscal Year Ended June 30, 1945	Fiscal Year Ended June 30, 1946	Fiscal Year Ended June 30, 1947	Fiscal Year Ended June 30, 1948	Fiscal Year Ended June 30, 1949
Department	$1,505,987.10	$625,790.23	$1,540,081.72	$1,441,522.95	$1,632,795.62	$1,897,333.34	$1,884,365.99	$2,089,511.09
Institutions	1,827,847.51	940,923.70	1,746,248.67	1,753,699.08	1,883,035.34	2,266,334.19	2,648,404.01	3,505,697.13
Total — State	$3,333,834.61	$1,566,713.93	$3,286,330.39	$3,195,222.03	$3,515,830.96	$4,163,667.53	$4,532,770.00	$5,595,208.22
Federal Grants	565,325.99	276,713.06	903,221.98	2,110,871.40	1,999,227.49	1,967,724.00	1,494,950.18	1,245,095.67
Total	$3,899,160.60	$1,843,426.99	$4,189,552.37	$5,306,093.43	$5,515,058.45	$6,131,391.53	$6,027,720.18	$6,840,303.89

Financial Statement Verified
(Under Requirements of C. 7, S 19 GL)
Date, May 23, 1950
By Joseph A. Prenney, *For the Comptroller*

Approved for Publishing
Fred A. Moncewicz, *Comptroller*

DIVISION OF LOCAL HEALTH ADMINISTRATION
CONSOLIDATED REPORT 1942–1949

Robert E. Archibald, M.D., M.P.H., *Director*

The beginning of 1942 saw the completion of the first State fiscal year in the Worcester Health District and almost a year of activity in the Northern Connecticut Valley District. These were the first units established to coordinate and distribute the activities of the Department more effectively, to reduce to a minimum duplication of promotional efforts, to give more thorough insight into health practices and needs of the local communities, and to exert more concentrated effort to improve existing conditions. The direction of this local health administration was under Dr. John J. Poutas, Assistant to the Commissioner, up to October, 1942, and then under Dr. S. L. Skvirsky. Each district was under direction of a district health officer with a staff consisting of public nurses, sanitary officer, medical social workers, nutritionist, physiotherapist, and clerks, whose duties were to carry out objectives, principles and policies of the Department of Public Health under the district plan. The remaining six districts were as yet not decentralized and were represented in the field by a district health officer.

During 1942 three additional districts (Southeastern, North Central and Berkshire) were organized on the district plan. A unit of public health nurses was transferred to the Division of Administration from the Division of Child Hygiene forming a nucleus for the Bureau of Public Health Nursing which assigned one nurse to each district office to serve as a supervising nurse in that area and an advisor to the District Health Officer on nursing matters. Also a dental unit was transferred from the Division of Child Hygiene and continued to promote dental services in local communities by lectures to professional and lay groups.

During 1943 there were several changes due to exigencies of Departmental work and of the war. In April, the general supervision of the districts was transferred to Dr. Roy F. Feemster, head of the Division of Communicable Diseases, while the bureaus remained under Doctor Skvirsky. The district lines were revised in order to provide more direct service to the public. At the request of the Office of Defense Transportation, some of the promotional activities were curtailed to eliminate unnecessary travel; this resulted in less field work by members of the staff. During this year also the remaining districts (South Metropolitan, North Metropolitan and Northeastern) were organized into functioning units of the district plan. The Bureau of Public Health Nursing planned an educational program for improving and developing local health nursing services. The Medical Social Service Bureau decentralized, putting a supervising social worker in each district. Through federal funds the EMIC was added to the existing medical care programs (tuberculosis control, crippled children clinics, venereal disease clinics, cancer clinics and dental clinics).

Studies were undertaken in the local application of fluorides to teeth for the prevention of caries. A dental advisory committee was named and several meetings were held. Under Chapter 16 of the Acts of 1943, rules and regulations for the licensing of dental clinics were prepared, presented and approved.

In 1944, under Doctor Feemster, the district health offices made further progress in organizing, adding personnel, purchasing furniture and equipment, outlining the responsibilities of certain workers, and setting up administrative procedures. Meetings of division directors and bureau chiefs, acting as technical supervisors for district personnel, were held to plan the coordination of the program of the workers in the districts; furthermore, these technical supervisors attended district staff conferences to aid in orienting all workers in regard to their programs. The work in some districts had been handicapped during the year by the lack of a district health officer to supervise the work. Six sanitary officers were covering the eight districts. Health educators from the Division of Adult Hygiene, who had been doing cancer work only, were assigned to the districts and were to engage in general health education. Three clerical positions were created in each district office by an increase in the federal budget. A "resources and activities" file was compiled in each district to familiarize the personnel with programs and problems of their local communities

to aid in better planning for work in these communities. Continued progress was made in the varied medical care programs. Assistance was given to the APHA Committee on Local Health Administration preparing plans to serve all areas in the United States by full-time medical health officers trained in public health.

Under Doctor Skvirsky the bureaus functioned to provide close and continuous working relationships for the successful operation of the district plan. In July 1944, the nutritionists in the Department were transferred from the Division of Child Hygiene to the Division of Administration with four being assigned to the Nutrition Bureau and eight to the district offices to give routine community nutrition services. The Public Health Nursing Bureau planned educational programs for local nurses by the nursing education consultant, gave two institutes on tuberculosis and one on maternal health, and assisted in reorganizing or coordinating local public health nursing programs upon request from various communities. The Medical Social Service Bureau contributed greatly to the effectiveness of the district plan by increasing opportunities for cooperation with other members of the district staffs with consultation on social aspects for the successful care of the sick or the physically handicapped. The activities of this bureau fell chiefly into division activities (tuberculosis control, crippled children services, maternal and child health, cancer and venereal disease control), community agencies and education. The Dental Bureau carried on a routine educational program, assisted in the licensing of dental clinics, and projected various studies relative to oral prophylaxis. In March of 1944 a supervisor for the district sanitary officers was appointed to coordinate and direct the ever-increasing amount of work done in this field.

Creation of a Division of Local Health Administration was approved by the Public Health Council and on July 1, 1945 was established with Dr. Roy F. Feemster as acting director. Through the district offices and bureaus the division continued to implement and interpret the programs and services of the various divisions of the Department in the local communities of the State. Dr. John J. Poutas returned from military leave in March 1946, and assumed the duties of director only to resign after three months. On July 1, 1946 Dr. Robert E. Archibald was appointed to the position.

The Bureau of Public Health Nursing during the year added to the staff consultants in maternal, pediatric nursing and rheumatic fever activities; continued to give basic courses of newer concepts in public health nursing to local nurses; assisted communities in regard to their administrative problems particularly relative to record systems and educational programs; demonstrated the need of bedside nursing in the western part of the state as a result of the American Red Cross relinquishing their services to local auspices; and developed an "in-service" training program.

The Bureau of Social Service made progress in the development of community relations and in the services rendered local workers in contacts with State, local, social and medical agencies. The departmental medical care program in maternal and child health, crippled children services, tuberculosis control and EMIC have had their scope markedly widened by this bureau.

The census of the physically handicapped children was transferred from the Department of Public Welfare to Crippled Children Services in this Department. This has resulted in more effective integration of the child's school and health problems by the social worker.

The Bureau of Nutrition has been concentrating on reorganization and reorientation of its program but carried on the routine community nutrition services by consulting on school lunch problems, participating in Well Child Conferences, Tuberculosis Consulting Clinics, Crippled Children Clinics, and giving education talks. It has been compiling an outstanding work also, to be called the "Community Nutritionist's Handbook".

The services of the Bureau of Sanitation increased tremendously giving assistance to school, state, and county institutions, local boards of health (restaurant sanitation program and courses of instruction for food handlers), and planning an "in-service" training program for local inspectors.

The Bureau of Dental Health continued its educational and research program. On July 1, 1946 the bureau was absorbed into the newly formed Division of Dental Health.

The Division had a large share in preparing legislation which the Department submitted. Members of the staff appeared before the legislative committee and supplied specific information as requested.

The Connecticut Valley District Health Office was moved from Greenfield to the University of Massachusetts on July 1, 1947. This change effected a more central location in the district and encouraged a much closer relationship with the faculty at the University of Massachusetts.

Dr. Fred L. Moore, a well-trained and experienced public health man, was appointed County Health Officer in Barnstable. The Division assisted in providing Dr. Moore with orientation and indoctrination as to the activities of ourDepartment.

Much time and effort was devoted to securing a physician for the Nashoba Health Unit which was without a director since 1943. Dr. Sidney Cobb was finally appointed July 1, 1948.

The Division had considerable responsibility in planning for the first Massachusetts Public Health Conference which was held at the University of Massachusetts, Amherst on September 11 and 12, 1947. The need for the development of adequate local health departments was highlighted at this conference.

In addition to the Massachusetts Public Health Conference, a conference for the Commissioners of Health and Directors of Local Health Services from all states in the nation was held at the University of Michigan in Ann Arbor. This conference, lasting one week, was for the purpose of reviewing Dr. Haven Emerson's plan for local health units for the nation. A drive was initiated at this meeting to organize local health departments.

The Bureau of Social Service this year concerned itself particularly with the Emergency Maternity and Infant Care Program and Crippled Children's Services as well as well child conferences, school programs and problems relating to patients with tuberculosis. This Bureau began to place increasing emphasis on developing in community agencies an awareness of their own responsibilities and potential skills, thus acting as consultant rather than providing direct services.

The Bureau of Public Health Nursing conducted a series of six institutes for school nurses and school administrators to discuss the "Proposed Functions of the Nurse Serving the School." Classes were also held for local nurses on "Maternity Nursing" and on "Growth and Development of the Child."

The Bureau of Nutrition, in addition to its program connected with statewide school lunches, also undertook institution food surveys at the request of the Commission on Administration and Finance.

The Bureau of Sanitation had as its objective the improvement of environmental sanitation at the local level by rendering assistance at the request of local sanitarians. The Bureau rendered assistance to more than 80% of the municipalities in the Commonwealth as compared with 65% during the preceding year. Thirty-four courses in restaurant sanitation were held this year with 119 sessions and a total attendance of over 8,000.

During 1948 the second Massachusetts Public Health Conference was held at the University of Massachusetts in conjunction with the Massachusetts Public Health Association and the University of Massachusetts.

On June 28, 1947 the General Court authorized an unpaid Special Recess Commission under Chapter 73 of the Acts of 1947 to study certain public health matters in Massachusetts and on December 3, 1947 the Commission issued their report (H1766). The Commission appointed as one of four technical sub-committees a Committee on Local Health Units. The Director of the Division served as a member of this Committee. The Division, at the request of this Committee, prepared several possible plans for districting the state in order that adequate local health departments might be established.

As an appendix to this report, Dr. Carl Buck, Field Representative of the American Public Health Association, studied and reported a proposed reorganization of the Department as follows:

The Nutrition, Social Service and Public Health Nursing Bureaus were transferred to the Division of Administration, and the Bureau of Sanitation was transferred to the Division of Sanitary Engineering. The Director of the Division of

Local Health Administration was also made Second Deputy Commissioner in charge of the newly-formed Section on Preventive Medicine which comprises the Divisions of Communicable Diseases, Venereal Diseases, Maternal and Child Health, Dental Health and Local Health Administration. These changes were effected January 1, 1948.

This year the Department established an Advisory Committee on Accident Prevention with the hope that some program could be developed to reduce not only deaths from accidents but the great amount of disability and crippling which occurs from accidents in the home, school and on the farm. The first meeting of this Committee was held on March 25, 1948.

The Bureau of Social Service undertook a new project in the field of education of medical social workers for public health programs. This project was made possible by funds from the Children's Bureau and is carried on in cooperation with the three schools of social work in Boston and the Harvard School of Public Health. The Emergency Maternity and Infant Care Program continued to demand many services from this Bureau.

The Bureau of Public Health Nursing participated in conferences relative to a project for the care of children of veterans attending Harvard University. This year also saw the continuation of demonstrations of public health nursing which had been undertaken the previous year in the towns of Princeton and Sterling. Nursing manuals were developed which could be used as a guide for public health nurses.

The Chief of the Bureau of Nutrition was on leave of absence to study at Western Reserve University. Her absence during the year tended to decrease the activities of this Bureau.

The Bureau of Sanitation's activities in the field of restaurant sanitation surveys increased as did the number of courses for food handlers. A total of 36 courses were given with a total of 8400 in attendance. The number of communities in the state which had adopted compulsory pasteurization regulations reached 100 this year.

In the fall of 1948 the Legislative Special Recess Commission appointed in 1947 and continued in 1948, submitted its report under Chapter 78 of the Resolves of 1948. The Commission report contained 20 bills. Appendices 6 and 7 were of particular interest to this division.

The districts continued to function satisfactorily except for the loss of the district health officer in the South Central District on March 1, 1949. Since that time Dr. Burke has been covering not only the North Central District, but the South Central District as well. This year also saw the transfer from the Department of Public Welfare of four hospital inspectors who were assigned to cover the eight health districts.

DIVISION OF CANCER AND OTHER CHRONIC DISEASES

CONSOLIDATED REPORT 1942–1949

Herbert L. Lombard, M.D., M.P.H., *Director*

Massachusetts became a pioneer in cancer control under government auspices on May 29, 1926. With no precedent to follow, with no knowledge of the public health aspects of the disease, without even a clear-cut idea that cancer was a public health problem, the Massachusetts Department of Public Health launched a cancer control program.

At that time the Department was less than half its present size, and its functions were far less than at present. The million-volt x-ray machine had not yet been invented, only a few carcinogenic agents were known, and our knowledge of malignant tumors was far less than it is at the present. Nearly a quarter of a century has passed. In 1949, instead of Massachusetts being the lone exponent of a well-integrated cancer program, the forty-eight states and four territories now have some form of cancer program, while the Public Health Service and the American Cancer Society are expanding their activities in cancer control.

On July 1, 1945 the Division name was changed from Adult Hygiene to Cancer and Other Chronic Diseases.

The Department has been aided by the Advisory Cancer Committee, the Advisory Chronic Disease Committee and the Advisory Cytology Committee.

Epidemiology and Biometrics

Genetic and Environmental Research — The American Cancer Society, Massachusetts Division, Inc. has made several grants to the Division which have enabled the continuation of the study of genetic and environmental factors in cancer, first started under a grant from the Rockefeller Foundation. This study enables a comparison of the relative importance of many variables in individuals with cancer of different sites, and in control populations. Those variables which exhibit significant differences between the two groups are treated by partial association and partial correlation in order to eliminate the possibility that mixed classification may be obscuring the results.

Data have already been collected from individuals with cancer of the cervix, cancer of the skin, and several groups of individuals without cancer. The grants from the American Cancer Society enable the Division to employ assistant biometricians to collect data. Analysis of the data is done by the regular staff of the Division.

A preliminary paper on cancer of the cervix and breast which was presented at the Fourth International Cancer Congress in St. Louis is being published this year in Revue Acta, Union Intern. Contre le Cancer. At the present time additional data, using a new set of controls, is being analyzed. While several months will elapse before this analysis is completed, some of the more important findings in the paper have been substantiated. The most important, that dealing with the strong association between early marriage and cancer of the cervix, has been confirmed. Further studies will be necessary to determine what factors connected with early marriage are responsible for this relationship.

While several workers are analyzing the material on breast and cervix cancers, others have begun the collection of data on environmental factors pertaining to skin cancer; while still others are working on codes for other sites of cancer.

Multiple Malignant Growths — In an effort to refute the hypothesis advanced by Peller that "A cured tumor leaves protection of the body against the development of other malignant neoplasms" data from the Massachusetts cancer clinics and the Palmer Memorial Hospital were analyzed. This study made by Lombard and Warren, and printed in the American Journal of Public Health, shows that more individuals were found to have multiple malignant growths than would be expected by chance, and that there was a considerable difference between data based on cancer histories in hospital records and those obtained by long-continued follow-up of cancer patients. The validity of this finding was questioned on the grounds that

(1) skin cancer was classified by itself and not combined with lip cancer as was done by Peller, and (2) an erroneous conclusion may have been made because of mixed classification.

A paper by Lombard, Levin and Warren substantiating the previous findings of Lombard and Warren is being published in "Cancer Research".

The Changing Cancer Death Rate — Results of a study on the changing cancer death rate were reported at the annual meeting of the Public Health Cancer Association in November, 1946. A summary of the study follows: During the past twelve years the adjusted mortality rates for cancer of the stomach, buccal cavity, skin, uterus and liver have shown downward trends for the white population of Continental United States. The rates for cancer of other sites, including pancreas, testes, prostate, intestines, lung and "other respiratory" sites, have shown upward trends; whereas for the larynx (female), vulva-vagina, breast, scrotum, bladder, esophagus, kidney (female), and rectum (female) no significant trend was apparent. The sites of origin showing downward rate trends may be divided into two categories: those that probably have been influenced by education and improved therapy, and one site (stomach) in which improvement may be the result of better living conditions.

Epidemiology of Diabetes — A study conducted by Joslin and Lombard in 1936 was repeated in 1946 and was in agreement with the preceding one. The records of about one-quarter of all cases known to have had diabetes failed to have the word diabetes on the death certificate. The average age of onset of diabetes in this study was a little over two years greater than on the first, and the average age at death was about five years greater.

Cytology Study — A cytologic research project, financed by the Commonwealth Fund, was inaugurated in 1945. The objective of this project was to determine the incidence of cancer of the uterus in women without gynecological symptoms. Most of the clinics under State supervision agreed to participate in this research.

Beginning January 1, 1945, vaginal smears were obtained from 3,586 women attending the cancer clinics and they were examined by the Papanicolaou technique. Some of the women had gynecological symptoms; others did not. The results of the examination of the smears have been tabulated and a report published. A three-year follow-up is now being carried out. The complete follow-up consists of a history, a pelvic examination and an additional smear taken three years after the original smear. Only a history is secured on those individuals who refuse to return to the clinic. Individuals with positive biopsies at the time the original smear was taken have not been followed. The follow-up of the entire series will be completed in July, 1950. The results of the first smear examination will be compared with this later information and an evaluation of the procedure made.

Cancer Detection Center — The Cancer Detection Center study was inaugurated to determine the place of a Detection Center in a cancer control program. The Detection Center project was inaugurated in May, 1948 although the Center itself was not officially opened until November 7, 1948. In the interim between the beginning of the project and the official opening, several pilot sessions of the Center were held in order to develop an adequate record form and to perfect an examination technique. It was known that in several other Detection Centers, efforts were being made to shorten the time of the examination, either by a more rapid examination or by limiting the areas of the body to be examined. In this study, emphasis has been placed on thoroughness rather than on speed, and the value of such an examination is to be measured.

During the time the Center has been in operation it has been shown that fear, familial history of cancer, and symptoms are three strong motivating causes for visiting the Center. It is felt that those having symptoms should not be examined at the Cancer Detection Center but referred to a diagnostic clinic. This will, of course, lessen the number of cancers found in the Center and increase the number seen in diagnostic clinics.

The importance of screening is one of the principal objectives of this study. In order to screen out individuals with any one of the seven danger signals of cancer from attending the Detection Center, each individual is interrogated by a non-medical member of the clinic staff, usually a medical social worker, for approximately one-half hour, or as long as necessary. Those complaining of any of the

signs or symptoms are referred to their family physician. This procedure is expected to limit greatly the number of individuals with cancer found at the Center.

The Center will endeavor to determine which part of the examination can be made easily in the physician's office; which part cannot be made in the physician's office and which part may be done in the physician's office if facilities are available and proper instruction is given the physician.

The study will include epidemiological data on the patients attending the Center as well as the measurement of publicity, the cost per patient and the time required for a satisfactory examination.

Methodology for Evaluating Cancer Education — Beginning June, 1949, a methodology study was conducted in Waltham, Massachusetts. Surveyors collected data to test the comparative merits of several types of interview which will determine the level of cancer knowledge and attitudes toward the disease existing among the people of Massachusetts.

The results of this study will furnish a base line for future evaluation studies of cancer education. At the present time the Cooperative Cancer Control Committees, which were originally organized by the Division, and now being activated by the American Cancer Society, are continuing to disseminate cancer education on a local level. It is planned to measure the work of some of these committees by means of the evaluation method selected as a result of the Waltham study.

Prior to the Waltham study, somewhat similar surveys had been done in Arlington, Brockton, Cambridge, Fall River, Fitchburg, Greenfield, Hyde Park, Lawrence, Lynn, Malden, New Bedford, North Adams, and Springfield. Several of these communities were selected at the request of the American Cancer Society, Massachusetts Division, Inc. Some of the communities have been resurveyed and a decided improvement in cancer knowledge was noted.

The Statistical Approach to the Cancer Problem in Massachusetts — A paper demonstrating the integration of statistics in the Massachusetts Cancer Program was presented at the 1944 Symposium of the Public Health Cancer Association of America, and published in the American Journal of Public Health in May, 1945. Most of the material selected for this report was from studies that have not been incorporated into the literature either because these studies were substantiation of previous ones or because their brevity did not warrant an independent report. Examples were given from studies prepared from data in the clinic records, hospital records, house-to-house surveys, and selected sample surveys.

Methodology for the Treatment of the Fourfold Table by Partial Association and Partial Correlation as it Relates to Public Health Problems — For several years an attempt has been made to develop a satisfactory methodology for the treatment of the fourfold table, when mixed classification is operating. A paper embodying the results of these studies was prepared by Lombard and Doering and read before the Biometrics Section of the American Statistical Association held in conjunction with the American Association for the Advancement of Science at a meeting held in Boston in December, 1946.

Chronic Disease Studies — Surveys were conducted in Waltham in 1946, in Arlington in 1949 and in the Nashoba Health District in 1949, to determine the incidence of chronic disease and methods of care and treatment in these localities and to compare the results with the survey of 1929–1931 carried on throughout Massachusetts. If the incidence had been found to differ greatly from the preceding survey, it was planned to expand these surveys in order to sample the entire state. The incidence of the various diseases did not differ enough from the preceding study to warrant the expense of a new survey.

Waltham Chronic Disease Study Follow-Up — In the winter of 1946–1947, 1,000 residents of Waltham, over the age of forty, chosen by means of the small sample survey technique, were interviewed regarding the presence of chronic disease. The Waltham death records will be checked continually to determine the cause of death of these 1,000 individuals and the interval between the survey interview and death. The death record data will be studied in relation to the original record. This procedure should enhance the accuracy of the survey and be a measure of how much reliance can be placed on such a survey without supplementary data.

SERVICE

State-Aided Cancer Clinics — State-aided cancer clinics are conducted in hospitals in various parts of the State. They are administered by the local medical profession, and receive advice and financial help from the State in the form of payment for diagnostic services rendered to the medically indigent. These clinics furnish group diagnosis for any individual in the Commonwealth regardless of his financial status. Individuals may come directly to the clinics but it is more satisfactory to have them referred by the family physician who has knowledge of the patient's previous condition. The Massachusetts cancer clinics offer an opportunity for individuals to receive expert advice from a group of physicians who are all thinking in terms of cancer. Follow-up service is maintained, and medical social service consultation is available.

In 1941, at the request of the Department, the Massachusetts Medical Society appointed Dr. Channing C. Simmons to survey the clinics. Dr. Simmons made an exhaustive study and reported to the Council of the Society. As a result of this survey improvement has been noted in the conduct of several clinics.

New Cancer Clinic Law and Regulations — Chapter 433 of the Acts of 1943 amended Chapter III of the General Laws.

A change in the method of clinic payment occurred in 1943.

New cancer clinic regulations were approved by the Public Health Council on April 11, 1944. These were compiled after consultation with the Comptroller's Office, the Attorney General's Office and the Clinic Chiefs. They were approved by the Council of the Massachusetts Medical Society.

Changes in Cancer Clinics — The Pittsfield clinic was closed at the end of 1942. The local committee felt that the attendance did not warrant its continuation and the Medical Society voted to discontinue it. Arrangements were made with the Visiting Nurse Association to conduct such follow-up of old patients as was necessary.

Some of the prime movers in the Newburyport clinic left for the service and the clinic closed temporarily for the duration of the war. Arrangements were made for patients to be seen in the Beverly clinic and for the follow-up to be done locally.

The small attendance at the Quincy clinic did not warrant its continuation and it closed in 1942.

In 1944, on account of the sickness and death of Dr. Farrar Cobb, the Cape Cod clinic was limited to teaching clinics.

Because of operating difficulties and poor attendance, the Gloucester Clinic was discontinued on November 9, 1944. This clinic was reopened in May, 1949.

Applications have been received for the establishment of new clinics at the Peter Bent Brigham Hospital, Mount Auburn Hospital, Cambridge, and the New England Hospital for Women and Children. The Cancer Advisory Committee has reported favorably on all of these proposed clinics, but it has been impossible to include them because of lack of funds.

The average cost per patient at the clinics during the calendar year 1948 was $3.92; four years previously the amount was $3.14. While the increase per patient seems comparatively small, the number of patients serviced accounts for a considerable increase in clinic costs.

In February, 1948, Dr. Harold H. Hennessey from the American College of Surgeons surveyed the cancer clinics.

Cancer Registration System for the Clinics — During the year of July 1, 1948–June 30, 1949, an important activity was the inauguration of a revised cancer registration record form. This required instructing the clinic workers regarding the use of the new form, and the transferring of approximately six thousand living case records to this revised card. This will enable the Massachusetts clinic data to be compared with that of other states without adopting a new reporting system. The new form has certain advantages over the old. One card replaces the two which were formerly used; eliminates questions which have not proved to be of value or have been sufficiently well answered; and adds information that is contained on the forms recommended by the American Cancer Society and the Public Health Service for use in reporting systems. During the year of July 1, 1949 – June 30, 1950, such difficulties as may be encountered with the new card will be studied and over-

come if possible. When the card is considered to be completely adequate for the clinics, it is hoped to extend this system into the hospitals in which the clinics are located and later into all hospitals in the State.

Heart Program — The new Heart Program of the Massachusetts Department of Public Health began officially in April of 1950 as a demonstration program subsidized by the federal government. It has as its objective the control of heart disease by promoting service, education, and research throughout the Commonwealth. Efforts have been directed first, toward service to the cardiac patient by setting up a cooperating cardiac clinic program; and second, by an educational program.

The major activity, the Cooperating Cardiac Clinic Program, is made up of sixteen previously established cardiac clinics located in various general hospital out-patient departments furnishing diagnosis and treatment to indigent patients. The clinics were accepted into the program on the basis of application and agreement to fulfill the requirements of the Department of Public Health, namely:

1. Conform to the standards of the American Heart Association.
2. Fill out a brief record form for each new patient attending the clinic.
3. Agree to periodic survey by a physician representing the Department.
4. Submit a monthly report of activities containing the number of old patients, the number of new patients, and the amount of money received from these patients.
5. Maintain the funds paid to the cardiac clinic in a separate account to be used at the discretion of the cardiac clinic staff.

At present there are sixteen active cardiac clinics which have received during the first three months a total of $9,136.22.

Our second important activity has been the educational program. One of its features was the Institute on the Public Health Aspects of Heart Disease held on April 27 and 28, 1949. This consisted of a series of meetings with talks by leading cardiologists and other workers in the field of heart disease for the purpose of acquainting those engaged in public health activities with the public health aspects of heart disease. In addition to the Institute, the Heart Program contributed $900 to the Massachusetts Medical Society for a series of thirty-six hours of post-graduate instruction in heart disease at Sanders Theatre, Cambridge, Massachusetts.

Epidemiological Consultation — All research papers containing statistics, prepared by Pondville and Westfield physicians, are reviewed by this Division to determine the statistical soundness of the conclusions drawn. In addition, many physicians throughout the State are requesting that papers prepared by them be verified statistically.

Tumor Diagnosis Service — With the exception of the period following the opening of the Pondville Hospital laboratory, and that following the changes in medical practice produced by World War II, there has been an almost continuous increase in the number of specimens examined. At the present time the percentage of malignancy among surgical specimens averages about 15 per cent.

Year	*Surgical Specimens*	*Doctors*	*Hospitals*
1926	2,484	371	52
1948	8,431	972	132

Dr. Shields Warren, in charge of the Tumor Diagnosis Service, has felt that the diagnosis of specimens submitted to this laboratory while of immediate concern, is only one aspect of the function of the Tumor Diagnosis Service. Of equal importance is the use of the material for enlarging the available body of knowledge concerning cancer. This work has been approached in three ways: (1) by advice and recommendations, as occasion required, to physicians using the service; (2) by training those doctors who are interested in the basic knowledge of tumors; (3) by histologic and statistical studies of material submitted to the Tumor Diagnosis Service.

Education

Professional Education — The educational activities of the Department are conducted in close cooperation with the Massachusetts Medical Society, the American Cancer Society, Massachusetts Division, Inc., and the Harvard School of Public Health. Professional education has consisted in graduate instruction, the distribution of a book "Cancer, A Manual for Practitioners" to every practicing physician in the State, an abstract bulletin for all physicians requesting it, a series of special teaching clinics held in different parts of the State conducted by specialists in cancer. The students at the Tufts Medical School, the School of Nursing at Boston College, Yale School of Public Health and the Harvard School of Public Health have been given instruction in cancer control.

Graduate Instruction for Physicians and Dentists — The Department participated in the graduate instruction in cancer and heart disease furnished by the Massachusetts Medical Society.

The Department cooperated with the Massachusetts Dental Society by furnishing a lecturer on cancer for the various district dental societies.

Teaching Clinics — It has long been recognized that the general practitioner sees a relatively small number of cases of cancer, particularly in the early stages. Numerous studies have indicated that the average practitioner may see from two to four cases yearly and these of different types of cancer. The cancer clinics offered the public a means for diagnosis, but did not offer the general practitioner the help he needed. In the early part of the program, attempts were made to remedy this situation by the Graduate Course in Cancer held April 23–25, 1929; by the regional demonstration clinics held during 1931; and by the Cured Caner Clinics held April 5–6, 1932.

Since 1933, teaching clinics have been held to enable the general practitioner to see many more cases of cancer than he did otherwise. Men experienced in cancer have conducted these clinics and the general practitioner has been invited to attend those nearest his home. Many physicians who have found it difficult to spend one or two days in Boston have arranged to spend two or three hours at the local clinic.

For several years, prior to the war, approximately 70 teaching clinics were held yearly with an average attendance of twenty-five physicians.

Attendance at the Teaching Clinics

Year	No. of Clinics	Attendance of Physicians
1933	2	75
1934	6	190
1935	16	422
1936	42	843
1937	69	1384
1938	74	1796
1939	63	1364
1940	49	1106
1941	29	636
1942	8	170
1943	10	252
1944	13	273
1945	18	655
1946	14	524
1947	13	537
1948	15	621 (19 dentists)

Cancer Institute — A one-week institute on cancer sponsored by the Massachusetts Department of Public Health; the Harvard School of Public Health; the American Cancer Society, Massachusetts Division, Inc.; the Massachusetts Medical Society, Cancer Committee; the Massachusetts Dental Society; and the Boston Health League, was held in Boston the week of November 16, 1947.

During the week, sessions were conducted for the staffs of the State-aided cancer clinics, a selected group of dentists, follow-up workers in the cancer clinics, and social workers.

"Fact Book" and "Cancer Statistics" — Two mimeographed booklets were prepared which depict the cancer situation. One, a comprehensive summary of the attendance, services, and follow-up of the Massachusetts cancer clinic patients was prepared on a chronological basis. These figures, together with other pertinent data,

were incorporated in a booklet called "The Fact Book" and distributed to the clinic staffs in Massachusetts and to individuals interested in cancer control throughout the country.

The other booklet, "Cancer Statistics" was composed largely of graphs, with a few tables interspersed, dealing with such subjects as the cancer deaths by sites, the age-specific cancer death rates from 1921–1946, the delay of cancer patients in seeking treatment, and the percentage of individuals alive 5, 10 and 15 years after clinic admission. This booklet, a joint project of the Massachusetts Department of Public Health and the American Cancer Society, Massachusetts Division, Inc., was distributed throughout the country and already has appeared in one bibliography.

"Cancer Bulletin" — The "Cancer Bulletin" is a publication of abstracts sent to all physicians in the State who requested that they be placed on the mailing list. It attempts to cover the important developments in cancer and its control.

Lay Education — In 1943 the Division completed the organization of a Cooperative Cancer Control Committee in every city and town. These committees were composed of a representative from each organization that met in a given community. The following activities of the committees have been worked out to a satisfactory conclusion in one or more city or town.

(1) Talks by local physicians
(2) Inauguration of school programs (supervision left to school authorities)
(3) Use of cancer films
(4) Conduction of cancer symposia
(5) Health talks and distribution of cancer literature in industrial concerns
(6) Display of exhibits and posters in public libraries
(7) Publication of newspaper and magazine articles (using Department material)
(8) Radio programs discussing cancer
(9) Translation of Department publications into foreign languages
(10) Cancer knowledge polls in communities
(11) Designing of posters
(12) Production of plays on cancer by individual clubs
(13) Formation in clubs of study committees on cancer
(14) Competition of committees and subsequent publicity
(15) Local public meeting on cancer (Symposium)
(16) Original ideas by local committees

Since 1948, the education of the public in cancer has become a joint responsibility of the Department, the American Cancer Society, and the Harvard School of Public Health. The Department furnishes some pamphlets, gives occasional lectures and devotes a considerable amount of time to evaluating education activities. The American Cancer Society is developing the Cooperative Cancer Control Committees originally organized by the Department, while the Harvard School of Public Health helps to unify the activities.

Cancer Education in the Schools — Beginning in 1942, the Department pioneered in the development of the teaching of cancer control in both junior and senior high schools. The keynote of cancer education of students has been the acquisition of knowledge for service to the community rather than the acquisition of knowledge for personal safety. This placed the emphasis on the social and economic phases of the disease, the service that students can render, rather than on the clinical aspects. It was hoped that some information would be conveyed to the parents. A junior high school and a senior high school participated in the experiment. When the project was inaugurated the Department assisted in both an advisory and teaching capacity. Later it evaluated the results of the experiment which established the value of the instruction of students. It was found that the parents of junior high school students had received more information on the subject than the parents of high school students.

American Cancer Society

The American Cancer Society allocated funds for two educational workers and two statisticians in 1945. Later they increased the number of statistical workers to four and transferred the educational workers to their own office.

Visitors to the Division

Representatives of the Department of Public Health, Medical Societies or similar organizations interested in cancer control from 36 states and 21 foreign countries have consulted the Department relative to the Massachusetts Cancer Program over the years.

The majority sent representatives who spent from one day to one month with the Department, studying the program. Others limited their inquiries to letters.

Representatives from four Canadian provinces — New Brunswick, Quebec, British Columbia and Manitoba — where cancer programs were being inaugurated consulted the Department. Other representatives came from the Philippine Island and Hawaii.

Publications

During this period sixteen publications were published by members of this Division.

Table I — *Outstanding Accomplishments*

Year	Number of new patients at the clinics	Median delay — in months — of cancer patients between first symptoms and visit to a physician	Percentage of cancer patients going to a physician within one month after first symptoms	Percentage of cancer patients attending cancer clinics referred by physicians	No. of cancer clinics	Specimens examined at the Tumor Diagnosis Service			Statistical Studies	Publications
						No. of Specimens	No. of Doctors using the service	No. of Hospitals using the service		
1931	3122	6.7	11.6	38.2	12	3285	772	80	8	8
1940	5498	4.6	21.0	86.4	23	3907	798	115	7	7
1941	5010	4.0	23.5	84.3	23	4200	890	120	5	2
1942	4377	3.8	22.7	84.5	20	3322	791	107	7	1
1943	3793	3.3	23.9	84.6	20	2926	648	105	7	2
1944	3863	4.2	19.0	88.4	19	3725	644	105	8	1
1945	3820	3.3	27.5	88.1	19	4700	686	103	5	1
1946	4026	3.8	23.0	87.0	19	5264	809	108	6	2
1947	4516	4.3	20.5	89.0	18	8474	1005	126	7	3
1948	4754	3.9	23.3	88.0	18	8444	1068	132	8	5

Table II — *Massachusetts Cancer Deaths**

Year	Number of Deaths	Average Age of Those Dying from Cancer	Age-Adjusted Cancer Death Rate per 100,000	
			Male	Female
1939	7092	64.2	138.2	143.0
1940	7390	64.2	139.8	148.4
1941	7486	64.4	145.9	141.7
1942	7534	64.3	144.5	140.5
1943	7587	64.4	142.1	140.4
1944	7690	64.4	140.6	140.2
1945	7922	64.8	146.1	138.5
1946	7932	64.8	142.7	137.1
1947	8273	65.2	148.6	138.3
1948	8668	65.3	155.9	140.4

*Adjusted to the age distribution of the total population of the U. S. for 1940. Ten-year age groupings were used between 30–70 with under 30 as one group and 70 and over as another.

TABLE III — *Total Attendance at Individual State-Aided Cancer Clinics*

	1942	1943	1944	1945	1946	1947	1948	1949
Beth Israel	1159	1285	1469	1384	1485	1321	1388	1590
Beverly	320	314	342	310	391	355	390	353
Boston Dispensary	1693	1465	1441	1402	1919	1987	2098	2348
Brockton	260	325	264	227	332	372	510	556
Fall River	637	607	751	744	938	1063	1318	1194
Fitchburg	210	165	152	113	116	145	193	179
Gardner	93	71	61	53	46	49	39	95
Gloucester	118	81	43					65
Greenfield	34	41	39	68	74	77	79	79
Lawrence	295	249	377	389	369	571	706	901
Lowell	327	283	336	209	244	238	273	298
Lynn	939	852	982	974	955	943	994	1046
New Bedford	421	375	350	344	409	599	674	881
North Adams	23	33	31	58	53	53	58	35
Salem	528	487	498	465	500	511	509	480
Springfield	409	511	541	486	510	597	556	507
Worcester	1001	933	1151	1068	990	1149	1240	1346
Pondville	8862	8223	6909	7303	6219	6343	6696	7792
Westfield	6613	6719	6681	6638	7636	8077	8353	7968
Total	23,824	22,938	22,375	22,235	23,186	24,450	26,074	27,713

TABLE IV — *Number of Social Service Contacts at State-Aided Cancer Clinics*

	1942	1943	1944	1945	1946	1947	1948
Beth Israel	1764	2476	3266	3013	2993	2834	2635
Beverly	840	702	831	902	1322	1624	1775
Boston Dispensary	3613	3926	3834	4230	5194	5057	6290
Brockton	973	1725	1462	1032	1714	1669	2068
Fall River	732	951	1115	1196	1488	2027	2469
Fitchburg	582	401	479	415	451	383	260
Gardner	721	528	478	512	401	421	427
Greenfield	296	336	419	402	294	326	336
Lawrence	1730	1792	1550	1846	2085	2433	2666
Lowell	684	413	1149	1110	903	867	1135
Lynn	3060	4409	3701	2973	2778	3613	3004
New Bedford	2364	4083	2588	2295	678	1308	1119
Salem	1673	1606	1555	1853	2245	1967	2432
Springfield	1590	2186	2274	2234	2411	2578	2031
Worcester	1937	2465	2710	2551	3043	2726	2624

TABLE V — *Attendance of New Patients at the Massachusetts Cancer Clinics*

YEAR	TOTAL INDIVIDUALS WITH NEW CONDITIONS	INDIVIDUALS WITH FIRST CANCER IN YEAR	PERCENTAGE OF INDIVIDUALS WITH CANCER
1927	1345	296	22.0
1928	2530	530	20.9
1929	2110	529	25.1
1930	2522	649	25.7
1931	3122	744	23.8
1932	3513	880	25.0
1933	3943	1028	26.1
1934	4261	1054	24.7
1935	3744	1089	29.1
1936	3957	1305	33.0
1937	4110	1377	33.5
1938	4993	1773	35.5
1939	5281	1816	34.4
1940	5498	1900	34.6
1941	5010	1790	35.7
1942	4377	1538	35.1
1943	3793	1459	38.5
1944	3863	1498	38.8
1945	3820	1517	39.7
1946	4026	1512	37.6
1947	4516	1504	33.3
1948	4820	1551	32.2

TABLE VI — *Promptness in Seeking Medical Advice Among Individuals Attending the Massachusetts Cancer Clinics in 1948*

Site	Interval — First Recognized Symptoms to Physician			Interval — First Recognized Symptom to Clinic		
	Individuals With Known Duration	Percentages of Individuals Visiting a Clinic Within One Month	Median Interval in Months	Individuals With Known Duration	Percentages or Individuals Visiting a Clinic Within Two Months	Median Interval in Months
Buccal Cavity	122	18.9	3.1	131	25.9	3.8
Digestive Tract	140	33.6	2.4	171	19.3	3.9
Respiratory System	39	41.0	1.7	50	20.0	6.0
Female Genitals	117	35.9	2.4	125	27.2	3.6
Breast	126	27.0	3.4	130	30.8	5.0
Male Genital Organs	12	25.0*	2.0	14	14.3*	6.0
Urinary Organs (male and female)	16	37.5*	2.0	24	20.8	6.4
Skin	316	9.5	12.3	340	8.2	12.6
Hodgkins and Leukemia	27	37.1	2.3	35	20.0	3.7
Others and Unspecified	31	29.1	2.5	37	27.1	3.6
Totals	946	23.3	3.9	1057	19.3	6.2

*Poorly established rate because of the small number of cases.

TABLE VII — *Stage of the Disease — by Site in Individuals Attending the Massachusetts Cancer Clinics in 1948*

Site	Localized	Regional Involvement	Remote Metastases	Recurrent	Total
Lip	81.9	3.6	0.0	14.5	55
Other Buccal	39.7	51.4	.9	8.0	113
Stomach	28.3	63.3	6.7	1.7	60
Rectum and Anus	56.4	32.3	3.2	8.1	62
Other Digestive	45.7	41.3	5.4	7.6	92
Respiratory System	57.6	24.2	6.1	12.1	66
Breast	37.6	31.0	8.1	23.3	210
Female Genitals	48.0	28.5	4.0	19.5	200
Male Genitals	41.2	17.7	23.4	17.7	34
Urinary Organs	37.5	17.5	12.5	32.5	40
Skin	88.5	2.2	.5	8.8	557
Other Organs and Unspecified	25.0	31.6	14.5	28.9	76
Total	938	343	68	216	1,565
Leukemia	—	—	—	—	18
Lymphosarcoma	—	—	—	—	12
Multiple Myeloma	—	—	—	—	1
Hodgkin's Disease	—	—	—	—	21
Other Malignant Lymphomas	—	—	—	—	16
All Cancer Cases	—	—	—	—	1 633

TABLE VIII — *Status of Patients at End of 5, 10, and 15 Year Intervals After Clinic Admission**

Rate per 100

	Dead With Cancer	Dead Without Cancer	Percent Alive
SKIN (800 cases)			
5 years after	16.1	14.8	69.1
10 years	23.8	33.1	43.1
15 years	27.1	44.6	28.3
LIP (183 cases)			
5 years after	32.2	9.3	58.5
10 years	36.1	21.8	42.1
15 years	37.7	36.1	26.2
REST OF BUCCAL CAVITY (277 cases)			
5 years after	68.9	5.1	26.0
10 years	72.2	14.1	13.7
15 years	73.3	17.0	9.7
BREAST (419 cases)			
5 years after	70.9	3.1	26.0
10 years	79.7	5.5	14.8
15 years	81.9	7.4	10.7
FEMALE GENITALS (317 cases)			
5 years after	76.3	0.6	23.0
10 years	81.7	3.2	15.1
15 years	83.3	3.5	13.2
ALL OTHERS (481 cases)			
5 years after	82.7	2.3	15.0
10 years	85.2	3.1	11.6
15 years	86.3	4.4	9.3

*In this table the clinic attendance between 1927–1931 was used, omitting all unknowns. In order to get long-term end results, only the cases attending the clinics in the earlier years have been used.

DIVISION OF MATERNAL AND CHILD HEALTH

CONSOLIDATED REPORT 1942–1949

FLORENCE L. MCKAY, M.D., *Director*

During the years covered by this report the Division of Maternal and Child Health saw many changes.

Although many services were transferred to other divisions, a few new services were acquired and several special projects were undertaken. Activities in the remaining services were intensified. In 1942 the dental staff was organized into a unit and transferred to the Division of Administration. The Nutrition Service was elevated to the status of a bureau and a Bureau of Medical Social Work was created in 1944. Both bureaus were transferred to the Division of Administration. The Annual Census of Handicapped Children and the Services for Crippled Children were transferred to the Division of Maternal and Child Health in 1945 and 1946 respectively, and a Bureau of Crippled Children's Services created.

ACTIVITIES OF THE VARIOUS SECTIONS OF THE DIVISION

1. Maternal, Infant and Preschool Hygiene.

(*a*) *Maternal Mortality Study* — A five-year study of maternal mortality was brought to a close in 1942 and a new five-year program was begun in 1949. The latter study is being carried on by the Maternal Welfare Committee of the Massachusetts Medical Society, with the Division of Hospitals and the Division of Maternal and Child Health. Maternal and Child Health Funds were secured from the United States Children's Bureau. For this study the State has been divided into two sections — the eastern section including the area east of the City of Worcester, and the western section including Worcester and the cities and towns west of it. An obstetrician is in charge of each section. Maternal deaths are reported directly to the obstetrician serving the area as well as to the Director of the Division of Hospitals. The obstetrician directing the area allocates the cases for investigation and reports to an obstetrician near the location of the death. These reports are studied by the Committee as a whole, which recommends whatever action is deemed necessary. For each case investigated physicians are paid a fee of $10.00. The two supervising obstetricians are paid $500.00 per year, which includes clerical services.

(*b*) *Prenatal Clinics* — A prenatal clinic has been maintained in Westfield throughout the period. This clinic is held approximately twice a month throughout the year. Effort has continued in the establishment of more prenatal clinics in hospitals. This activity was hampered during the war by lack of available personnel, many clinics already established had to be closed during that period. The Morton Hospital in Taunton reopened its clinic during the past year.

Advisory service was given to prenatal clinics in several service camps during the war and after the war to clinics held in certain housing projects.

(*c*) *Prenatal and Postnatal Letters* — This service, which had grown in volume since its inception was curtailed abruptly in September 1943 because of the Emergency Maternity and Infant Care Program which began on September 3, 1943 and required the use of the entire clerical staff of the division. Only the printed pamphlets on prenatal and infant care were sent out until the liquidation of the Emergency Maternity and Infant Care Program in April, 1947. Comparative figures of the last year before the interruption by war activities and the first year of resumption of service are given below:

	1942	1948
New requests for prenatal letters	8,526	2,513
New requests for postnatal letters	10,675	8,879

(*d*) *The Emergency Maternity and Infant Care Program* — The Emergency Maternity and Infant Care Program was a program to provide maternity care for the wives of service men in the four lower pay grades, and for the pediatric care of their

infants under one year of age. Ordinarily at least a year is spent in preliminary preparation for a new health program but because of the emergency nature of this service, barely six months were spent in this preparation.

Technical committees on obstetrics and pediatrics were set up to pass on the qualifications of participating physicians. Excellent cooperation was obtained from the 159 hospitals and 3370 physicians participating in the program. The greatest volume of cases was processed in the year of 1944 when 10,156 maternity cases received care, resulting in 9936 live births — representing 13% of the total infants born alive in Massachusetts for that year. For the 5-year period 43,771 cases were authorized for care of which 33,605 were maternity and 10,106 were infant cases. $4,008,970.19 of the allotted $4,131,677.66 were expended. The Massachusetts Emergency Maternity and Infant Care Program was rated best in the country by the Children's Bureau. A special report of this program has been made, which will be in print in 1950. One of the far reaching effects of the Emergency Maternity and Infant Care Program was the stimulation of a desire for good prenatal, postnatal, and infant care among the general population.

(*e*) *Program for the Care of the Prematurely Born* — The Massachusetts program for the care of the prematurely born was the first state program of this kind and was inaugurated in 1937. A law was passed providing for the reporting of premature births, the providing of suitable centers for the care of these infants, and the providing of suitable transportation to these centers. 48 centers were established outside the Metropolitan area on a geographic basis in such a way that no infant born outside one of these centers had far to travel to obtain care. It was also required that payment of hospital expenses of these infants be made by local welfare boards in the event the families concerned were unable to meet these costs.

Despite this early progress the public in general, including physicians, was not familiar with the law concerning the care of prematurely born infants, nor with the availability of 48 hospital centers established for their care throughout the State. This appalling state of affairs was brought to our attention in January, 1949, when the following incident was reported to the Commissioner of Public Health:

Six premature infants born outside of Boston (one of whom was born outside of the State) were transferred to a Boston hospital. Only two of these infants survived. An investigation disclosed that a few were improperly cared for during transportation; also that all the infants could have been cared for in a premature center nearer the place of delivery. Following this tragedy an immediate spot survey was made in all health districts to determine: (1) the number of *premature infants* born; (2) care they received after birth; (3) local boards of health and welfare, as well as hospitals, were questioned regarding their knowledge and interpretation of the law for the care of the *premature infant.* Because of the information received the following material was assembled and distributed to every physician, hospital superintendent, local board of health, and local board of welfare:

List of hospitals and their location, which are equipped to care for premature infants

Copy of the law concerning the *premature infant*

Copy of the leaflet "Your Premature Baby"

Publicity was obtained through the newspapers, medical journals and radio. The Division program for care of the premature infant was discussed at staff meetings of the District Health Officers and at the nurses' staff meetings.

The Committee on Fetus and the Newborn of the Massachusetts Academy of Pediatrics and the Division Director prepared an article which was published in the June 2, 1949 number of the New England Journal of Medicine, concerning the premature program and the care of the *premature infant* before it is sent to the hospital and during its transfer. Reprints of this article were ordered and a mailing list for distribution was prepared.

As a result of the survey it was found that many persons responsible for premature infant care were not familiar with the law; that the law was very confusing, and in some instances it was not acceptable to parents because of the relationship to welfare. Therefore, after many conferences with the Department staff, the Advisory Committee on Care of *Premature Infants,* the Massachusetts Medical Society, Chiefs of the pediatric staffs of the Massachusetts General Hospital, the Children's

Hospital, the Boston Floating Hospital and the Boston Lying-In Hospital, the Director of Aid and Relief of the Department of Public Welfare, and the Commissioner of Veterans' Services — a revision and simplification of the premature law was drafted and submitted to the legislature. The changes in the law are as follows: (1) Changing from 5 to 5½ pounds birth weight as the definition of a *premature infant,* to conform to the Federal Government and other state definitions. This was recommended by the Recess Commission. (2) Changing hospitalization payment to cover infants weighing 4½ pounds or less at birth because infants of lower weight need longer hospitalization than those of more than 4½ pounds who are usually in the hospital for shorter periods. (3) Changing to local boards of health for reporting and for payment for hospitalization to avoid the welfare stigma, and it is hoped to broaden the interpretation of need.

A generous donor provided premature carrying ambulances wherever the survey by the Committee on Fetus and the Newborn indicated a need.

Plans were discussed with this Committee for a regional conference for physicians on the care of the *premature infant* to be conducted during the coming year if funds became available.

No refresher courses for nursery supervisors in the care of the infant prematurely born, and no institutes for physicians were given during the war years. Early in 1942 all nursery supervisors in the 48 hospital centers had received special training. No further specialized training was offered until late in 1945 when a course in premature nursing was conducted for the New England States by the Children's Bureau at the Boston Lying-In Hospital. Two nursery supervisors, one from Quincy Hospital, the other from Morton Hospital in Taunton attended. Two more supervisors attended a similar course in 1946. During 1947 two nursery supervisors attended a three-month course in care of the prematurely born infant at Johns Hopkins Hospital; three more were sent in 1948. As a direct result of this, refresher courses for nursery supervisors were organized at the Massachusetts Memorial Hospital and the Burbank Hospital in Fitchburg. These courses were for two-week periods, and concerned the care of the prematurely born infant. 26 supervisors attended in 1948, and 19 in 1949. Tuition and stipends were paid for those attending.

Throughout this period a gradual improvement was made in both personnel and equipment in the 48 hospital centers for the care of the prematurely born infant as well as in the hospitals located in the Metropolitan areas. A unit system of care is being adopted in most hospitals, and many are using autoclaving as a means of terminal sterilization of formulae.

During 1947 several outbreaks of diarrhea occurred in new-born nurseries, including nurseries for the prematurely born. Because of the gravity of the situation an institute on infectious diarrhea was held. Other divisions of the department were brought into the picture, namely: the Division of Local Health Administration, Division of Communicable Diseases, and the Hospital Licensing Bureau. Four regional conferences were held in Springfield, Salem, New Bedford, and Boston. Many hospital administrators and other members of hospital staffs attended, as well as from one to thirty members of their staffs. The institutes were considered to be most successful in stimulating interest in this problem. A report of this institute was published and sent to a comprehensive mailing list.

"Premature Infants" a Manual for physicians published by the Children's Bureau of the United States, was sent to all hospitals for the use of their staff, and to the nursery supervisors who have taken refresher courses. Additional copies may be obtained on request.

Consultation service was extended to hospitals planning the construction of new or remodeling of existing nurseries. So many requests for such service came as a result of the boom in hospital building and remodeling that a committee was formed consisting of Dr. MacKnight, Dr. Rubenstein and Dr. McKay, to review the construction plans for hospital nurseries. In this way, the points of view of construction, licensing, and pediatric care could be obtained.

The improvised incubator devised by this division was sent to the Children's Bureau at their request and was approved by the United States Bureau of Standards and by the Children's Bureau in 1942.

(*f*) *Well Child Conferences* — Prior to 1942 much work had been done throughout the State in demonstrating the value of well child conferences. Many communities had begun to set up their own conferences. It was the intention of the division to reduce its activity in this field as rapidly as possible after sufficient local interest had been stimulated. With the onset of war, however, and the resultant depletion of medical personnel, especially in rural areas, it was necessary to continue State participation in this field at the same, and even a greater rate than previously. Despite this a few communities continued to set up locally-sponsored conferences so that by 1948, 153 cities and towns had established conferences. There were 276 well child conferences in operation throughout the state, 7,283 sessions were held to which 51,816 patients made 147,640 visits, or an average of 2.8 visits per patient per year. 19.4 sessions were held per 1,000 children under 5 years of age. Only New York superseded Massachusetts in amount of service per child population. Although this appears to be a splendid record there are many parts of the state where little or no health supervision of children is being carried out except by private physicians. It is in these areas that the physician population is scant, and the State Well Child Conference Units have had to continue with the State sponsored clinics in these communities. In eighteen communities 1282 children were examined in State sponsored conferences in 1948, as compared to 2702 children examined in 59 communities in 1942. The table given below shows a definite improvement in general health of the child population. Although much of this can be attributed to the improvement in the general economic status of the people, the awareness of families to the importance of health supervision of infants and children is borne out by the marked increase of the number of children attending the conferences who had had previous immunization to diphtheria. Much of this effect has been accomplished by the Well Child Conference program activities through the years.

Well Child Conferences and Nursery School Examinations

1942 and 1948

	1942	1948
Number of examinations	2702	1282
Infant examinations	9.6%	10.6%
Preschool examinations	90.4%	89.4%
Children with defects	77.4%	63.6%
Children with major defects	58.7%	34.6%
Children referred to physician	26.7%	19.3%
Children referred to dentist	40.4%	23.2%
Children referred to both	14.0%	4.9%
Children with poor eating habits	26.4%	17.0%
Children who need habit training	38.0%	17.4%
Children who have not been vaccinated	73.1%	70.4%
Children who have not completed TAT	44.2%	27.7%

Percentage of Children with Specified Defects

Teeth	41.6%	21.5%
Nutrition	25.8%	12.2%
Feet	16.4%	10.4%
Throat	15.7%	11.6%
Skin	8.8%	12.5%

Advisory services have been furnished communities who have or are interested in setting up their own conferences. Some financial aid continues to be provided to a few local conferences in the form of fees to the attending physicians. Nutritionists and dental hygienists are supplied to many conferences from the District Health Offices. Public Health Nursing supervision and follow-up is available to all communities.

After a lapse of seven years due to war activities a refresher course for Well Child Conference Physicians was conducted in 1949 at the Harvard School of Public Health. This consisted of two one-day conferences and was attended by eight

physicians. A letter was prepared for distribution to local well child conferences advocating the testing of vision and hearing of all children four years or over, in local well child conferences.

Revision of "Organization and Conduct of Local Well Child Conferences" was made and copies were sent to the organizations administering local conferences.

In 1946 conferences were held with the Division of Child Guardianship of the State Department of Public Welfare with the result that examinations of State wards may be carried out at the State Well Child Conferences.

2. Child Growth and Development.

Work on the Massachusetts Vision Test and the Massachusetts Hearing Test consumed much of the time and energy of this branch of the Division during the eight years covered by this report. Need for these tests was first realized through the preschool readiness conferences where many deficiencies in both sight and hearing were found. To determine the amount of handicapping which such deficiencies produced, it was necessary to have tests which adequately determined the amount of deficiency present. To prevent unnecessary loss of learning ability in the early grades, these tests had to be applicable for use in screening preschool, kindergarten, first and second grade children. Much time was spent in research in the development of both these tests. Once the tests were developed their usefulness had to be demonstrated through lectures, demonstrations, and practical applications in well child conferences, school health examinations and before groups of school administrators, teachers, students in teachers' colleges and other interested personnel. Training centers had to be set up to instruct those who were to carry on the tests in their local communities. Instruments had to be calibrated and checked now and then in order to assure good results.

Results of all this effort have been gratifying. The Massachusetts Vision Test was officially approved by the Council on Physical Therapy of the American Medical Association in 1943. It was adapted for use in the armed forces, and is used to some extent by 38 other states. Ninety percent of the cities and towns of Massachusetts are now using this test. Many communities have purchased their own equipment, others are loaned equipment from their District Health Offices. In September, 1947 in the Oak Ridge Eyesight Conservation Institute it was announced that the State of Arkansas was about to purchase $7,000.00 worth of equipment so that every school child in Arkansas could be screened by the Massachusetts Vision Test.

The Massachusetts Vision Test is one by which defects such as myopia, hypermetropia, astigmatism, and muscular imbalance can be detected. The units in the test are so simple that a preschool child unable to read can still be tested. The universality of its use, and the relative simplicity of the equipment necessary has made the test widely accepted. About 27% of children tested have defective vision.

In 1946 the audiometer service, assignments, and all functions concerned with audiometer testing were transferred to the Child Growth and Development Service. District Health Officers were assigned audiometers for loan to communities within their districts.

The Massachusetts Hearing Test was devised first with the use of a record for sound reproduction in group testing. In 1947 an impedance matching device was adopted for the reproduction of sound from individual pure-tone audiometers through group earphones. A year later the record for sound reproduction was discarded, as was also an illustrated card heretofor used as an instructing device to the testee. The test as now devised uses an individual audiometer, group earphones, and an impedance matching device. The child responds to the presence or absence of stimulus by underlining words, rather than responding to a picture card. By an arrangement of equipment components, 10, 20, 30, or 40 children may be tested at once. This eliminates the necessity of transporting from school to school receiver trays which would not be used in many instances.

The pure-tone audiometer used in this test reveals high frequency as well as low frequency losses, thus enlarging the scope of the test. About 9% of children tested by this method are found to have hearing defects, as compared to 2% found by other methods.

An effort has been made to stimulate a more thorough follow-up by local nurses, and to secure reports which will provide necessary statistical information.

Between 200–225 cities and towns in this state and cities in 15 other states as well as the whole State of Texas are using the test.

A study in stereopsis and the effect of the lack of it on the learning processes, as well as in athletics, was undertaken but the results were inconclusive, and the study was abandoned.

A speech study is now in progress. This is a study of speech sounds, and has been carried out with the aid of Walter F. Dearborn, M.D., Ph.D. The purpose of this study is to analize speech sounds by electro-mechanical methods so that a feasible system may be devised for the production of visible speech. This would be of great importance in educating deaf children. Some progress along these lines has been made. By using a play-back, amplifier, 12-channel wave analyzer and a constant-speed film, fairly satisfactory pictures of visible speech have been obtained. These pictures are unique for a given word and for a given individual, and can be learned. The pictures are highly reproducible insofar as configuration is concerned. A secondary purpose of the program is to check on the possibility that "inner speech" a phenomenon presumably present during silent reading — can be measured and analyzed. This part of the study is of importance to educators and others in the field of reading.

The School Health Council requested the Head of Child Growth and Development Service to act as consultant to the Council on school lighting for the purpose of improving lighting conditions in the schools. With the Council, a study of lighting conditions was made and recommendations for school lighting were developed. These recommendations were printed in the Spring issue of *Contact* and in the February editions of the *Massachusetts Educational News* in 1946. Both of these publications reach all school administrators.

In 1949 the Head of Child Growth and Development Service assisted the personnel of the Massachusetts Society for the Prevention of Blindness and the U. S. Children's Bureau in setting up a study of the relative merits of various methods of screening the vision of school children. This study was carried on in St. Louis at the invitation of the National Society for the Prevention of Blindness. Personnel were trained in the proper use of the Massachusetts Vision Test, one of the devices under investigation.

Otolaryngologists, ophthalmologists, and experts in the fields of light, sonics, and electronics, who cooperated in the vision and hearing studies, rendered willing, able, and invaluable help and contributed in large measure to the work. Without their help much of this work could not have been done.

3. School Health.

(*a*) *Millville School Health Program* — School health supervision was carried on in Millville for a nine-year period until April 20, 1944, at which time the school health service became free of State aid. This community was used to study the different procedures in a school health program before using them on a State-wide basis. The improvement in the physical condition of the school children during the years of this study was appreciated by both parents and teachers. A standard vitamin-mineral preparation was supplied to the children. Marked gains in general health were obtained and the rejection rate for those examined for the armed service was very low.

(*b*) *Haverhill School Health Program — 1948* — In conjunction with the District Health Officer in the Northeastern Health District, a conference was held in Haverhill with the Board of Health late in January, and another a week later with the Board of Health and five school physicians regarding an evaluation of the school health program in Haverhill, and specifically in one of the schools (Tilton) where there had already been established a School Health Council. As a result of these conferences the District Health Officer was asked to complete the evaluation schedule recommended and provided by the American Public Health Association. In June, the evaluation schedule was discussed in the Division with the District Health Officer, the District Health Education Worker, and Dr. Cunningham, the Public Health Physician of the Bureau of Health Information. At this meeting it was decided that the District Health Officer would contact the Haverhill Board of Health

and the Superintendent of Schools to arrange a meeting for the discussion of the results of the evaluation.

In connection with this program the Assistant Director of the Division and Miss Hiller, the Nursing Consultant in School Health, conferred with Father Sherlock, the Diocesan Director of School Health for parochial schools, relative to the work under discussion.

Five regional conferences on school health for school nurses were conducted by the Bureau of Public Health Nursing.

(*c*) *General* — Visits of District Health Officers to the schools for the purpose of discussing health problems with the school supervisors, physicians and nurses have been carried out with gratifying results.

School Health Council meetings have been held regularly.

One of the most successful projects undertaken was that of a conference for superintendents in 1946. 5 one-day conferences on school medical services were held. 95% of the school superintendents in the State attended these conferences. Dr. George Wheatley, Secretary of the School Health Section of the American Public Health Association, Advisor in School Health to the Children's Bureau, and Assistant Director of Metropolitan Life Insurance Company, conducted the conferences. The morning session was devoted to the topic "Present Trends in School Medical Services", with special attention to four topics previously chosen by the superintendents for discussion, as follows:

1. How may the work of the school physician be improved?
2. How may the role of the classroom teacher be strengthened?
3. How may relationships to public health and community agencies be improved?
4. What methods will bring about closer coordination of the school medical examinations with the total school health program within the school administration?

During the afternoon session the superintendents were assigned to committees to plan and recommend action on the four topics listed, and worked well in group participation. Their recommendations were excellent and were published in a succeeding number of *Contact*.

Results from these conferences were requests for advisory service in school health programs and for Well Child Conferences from superintendents and from District Health Officers to this Division. One of the results of these conferences was the request from the superintendents' group that *school health services* be given a place in the activities of the *Massachusetts Medical Society*. Consequently the Massachusetts Medical Society appointed a subcommittee of the Public Health Committee to consider school health services.

Two courses for school physicians were organized and conducted by the Bureau of Health Information and the Harvard School of Public Health. 39 physicians from 30 towns attended.

Contact, the bulletin for superintendents of schools and school physicians was prepared in this Division and published regularly until 1948 when all activities of this service were taken over by the Bureau of Health Information.

A one-week Workshop for School Nurses was conducted through Maternal and Child Health funds, by the Bureau of Public Health Nursing, at Simmons College in 1949.

Guide to School Health was twice revised by the Division of Maternal and Child Health and was transferred with the school health program to the Bureau of Health Information for publication.

Workshops for Teachers, in Health Education, with credit, were given at the Harvard Graduate School in 1945; in Pittsfield in 1946; and in Hyannis in 1947.

A six-week Workshop for Teachers of Health Education was given at Amherst Summer School in 1946.

4. Health Education.

A course for credit at the Harvard University Summer School on "Youth Standards in War-Time" given in 1943 was unusually successful.

A 3-year training program for parent education was organized. The work was to be done in (1) small parent groups studying the needs of children of each age group in regard to physical and emotional health; (2) institutes conducted for three or more years in major cities. 20 to 40 leaders from as many different communities in each of the 3-year training groups illustrated considerable local interest in this field. In 1943 this program was discontinued by the Commissioner, after the resignation of the Teacher-Training Coordinator in Parent Education.

Classes for mothers and fathers in maternal and infant care formerly carried on by this Division are now conducted entirely by local nursing organizations.

A three-year Study of Health Education in Secondary Schools was conducted, sponsored by the State Departments of Education and Public Health, the Massachusetts School Superintendents' Association, the High School Principals' Association, the Massachusetts Medical Society, the Massachusetts Dental Society, the Academy of Pediatrics, Boston University, Harvard University, and the Massachusetts Institute of Technology. Work on the Study was done in the Maternal and Child Health Division; reports were prepared in this Division and published in the Journal of School Health.

A Committee on the "Guide to Health Teaching in High Schools" resulting from this Study was appointed by the Commissioner of Education with the Teacher-Training Coordinator of this Division as Chairman. They have produced several units, the organization, editing and clerical work being done in the Division of Maternal and Child Health until March, 1948, when the Teacher-Training Coordinator was transferred to the Bureau of Health Information.

Medical consultations and many workshops for teachers in individual communities were conducted, on request.

On July 1, 1944, a Bureau of Health Information was formed and incorporated into the Division of Administration. Much of the activities of health education was carried on by this bureau.

In July, 1948, all school health services were transferred to the Bureau of Health Information and a coordinator of health education serves as a liaison agent for the Department, including this Division.

5. Nutrition.

Each year an annual one-day conference for New England nutritionists was conducted by the Division of Child Hygiene, the programs varying from year to year. Nutrition demonstrations were conducted in Barnstable County, Bristol County, Plymouth County and the towns of Cohasset and Hanover. In 1942–43 the nutritionists were placed in some of the health districts. By 1944 there was a nutritionist in each of the 8 District Health Offices and 4 nutritionists on the Boston staff.

During the war years a great deal of stimulus was given to nutrition activities and the nutritionists of the Division gave courses for training home economics personnel, for Red Cross courses in nutrition, and for canteen workers. One nutritionist was assigned part time to the Committee on Public Safety for the coordination of their activities in nutrition with those of the Division and other organizations. Nutritionists gave intensive service to school lunches throughout the State. They visited prenatal clinics and assisted in arranging nutrition exhibits for clinics. They cooperated with the State Teachers College at Fichburg in courses in nutrition; gave consultation service to the State Sanatoria for Tuberculosis; held group meetings for professional and lay groups; participated in local as well as State Well Child Conferences; conducted kitchen parties for home makers; gave service to Day Care Centers and to industries; conducted newspaper publicity on nutrition for various local newspapers.

The year 1944 marked the *twentieth year* for nutrition service in the Department of Public Health and in this year the nutrition group was transferred to the Division of Administration.

6. Medical Social Work.

Monthly discussion groups for nurses were conducted in medical social work. Studies were made of economic and social factors involved in behavior problems of cases referred by the Well Child Conferences. A syllabus on child care for use in training volunteers for Day Care Centers was written with the cooperation of the Massachusetts Committee on Public Safety. Social problems in school children in the Town of Millville were given special attention.

After the beginning of the Emergency Maternity and Infant Care program in 1943 much time was given to social problems arising in this field.

In 1944 a Bureau of Medical Social Work was established in the Division of Administration and since then the Medical Social Work Supervisor has become a consultant to the Division of Maternal and Child Health and acts as liaison between this Division and the Bureau of Medical Social Work; also the District Medical Social Work Supervisors and other social agencies.

In 1945 a special study was made of rejected cases under the Emergency Maternity and Infant Care Program to determine the needs for their social service follow-up.

In 1945 a special study of medical social service needs of infants who have passed their first birthday was started but has not yet been completed.

Consideration of what the social worker is offering and should offer in relation to the Maternal and Child Health Program, exclusive of Crippled Children's Services, led to plans for a social work staff meeting on this subject. Workers from the districts discussed the sources of referrals, kinds of services offered, and further opportunities. It was clear that many requests were for the same kind of help that is offered to orthopedic and plastic cases, on behalf of children with other diagnoses. Other referrals came from Well Child Conferences and from the Census of the Physically Handicapped. Services offered for these patients varied from simple information regarding resources to extended study and evaluation as a basis for advice to local workers. It was agreed that further effort was needed to interpret the social services of the Department to prenatal clinics and to hospitals with premature nurseries.

The function of the Medical Social Consultant in Maternal and Child Health would seem to be that of continued study of the problem in this field and their social and emotional implication. She is aware of new developments in the program and can assist in planning for the welfare of the patient. She interprets new developments to the district workers, as in the working out of the revised law on the care of infants prematurely born. She correlates the social work in the districts with the activities of the Maternal and Child Health Division staff as in stimulating the follow-up of vision and hearing tests. She is the link between the Division and the Bureau of Medical Social Work.

7. Dental Health.

In 1941–1942 the Dental Unit was included in the Division of Child Hygiene. During that time dental education in schools and in hospital training schools was promoted. Dental services were stimulated on a local basis. Dental surveys were made in the schools. The services of the dental hygienists were given to the Division Well Child Conferences and an attempt was made to promote dental service in prenatal clinics. Refresher courses in children's dentistry were conducted in several communities of the State in cooperation with Forsyth Dental Infirmary, so that they were made available to all students of the State. In some summer camps dental examinations were made of the children upon request of the camp officials. The dental staff participated in courses given at Harvard and Tufts Dental Schools, at Boston University and at Forsyth Dental Infirmary.

Working with the State Department of Public Welfare, rates were established for the payment of dental care for welfare cases.

The promotion of community dental programs as a part of general community health organization was carried out through this group.

8. Crippled Children's Services.

Analysis of the statistics for the seven-year period covered by this report shows a steadily increasing service to crippled children in Massachusetts. During this period a total of 16,923 clinic visits were made in the eleven monthly orthopedic clinics and the two clinics for plastic surgery, in contrast to 9,394 visits in the previous six years. During the six-year period previous to this report, the average clinic attendance was 16. During the seven-year period covered by this report, attendance averaged 20 children per clinic session.

The number of new cases admitted to Services for Crippled Children increased from 244 in 1942 to 732 in 1948. The number of active cases increased from 924 on January 1, 1942 to 1988 on December 31, 1948. This great increase is due to the fact that almost all of the children admitted to service required treatment over a period of years. About one-quarter of the cases admitted in 1942 were still under active care as of December 31, 1948.

By legislative action during 1945 the Census of Handicapped Children was transferred from the State Department of Public Welfare to the State Department of Public Health, and in September of that year this activity and the register of such children were centered in this Division.

On January 1, 1946 the Service for Crippled Children, formerly administered through the Division of Administration, was transferred to the Division of Maternal and Child Health.

In December 1947, the Massachusetts Rheumatic Fever Program was started with the opening of a Rheumatic Fever Clinic at North Reading State Sanatorium. The clinic serves children under twenty-one years of age living in the Northeastern Public Health District, having or suspected of having rheumatic fever. By the end of 1948, 103 children made 252 visits to this clinic. A second Rheumatic Fever Clinic was opened in the North Central Health District in March 1949. Intensive public health education in the needs of the rheumatic fever patient was carried on in both districts.

North Reading Rheumatic Fever Clinic 1948

Total cases	103
With Rheumatic fever	41
Active rheumatic fever	21
Inactive rheumatic fever	20
Rheumatic heart disease	20
Family history of rheumatic fever*	15
No rheumatic fever	62

*Parents and siblings

The cost of hospital care has increased to such an extent over the past seven years that the average family is no longer able financially to meet the expenses of hospital care, which averages three months in the rheumatic fever patient. Hospitalization for the child with rheumatic fever under twenty-one years of age has been available at the North Reading State Sanatorium on a state-wide basis since April 1949.

In 1948, Lakeville State Sanatorium was authorized to admit any crippled child, as defined by the State, who had been living in Massachusetts for twelve months preceding the date of the admission application.

In 1949, State funds were made available to Services for Crippled Children for the first time. Prior to this period, the service had been provided by Federal funds, with matching funds allotted to Lakeville State Sanatorium.

Services for Crippled Children is deeply indebted to all the clinic consultants for the excellent quality of the service they have given, and to the physicians in the Commonwealth for their cooperation with and support of the efforts of the service to rehabilitate crippled children to active lives so that they may be self-supporting and not a burden to the Commonwealth.

9. General.

The Division of Maternal and Child Health cooperated with the State Departments of Agriculture, Education, Extension Services, Mental Health, Public Welfare, and similar state organizations interested in maternal and child health by acting on advisory committees, and coordinating effort in the handling of problems presented. Conferences were held with lay and professional groups requesting advice concerning local problems in maternal and child health activities. Lectures on pediatrics and obstetrics were given each year in the post-graduate courses for physicians conducted by the Massachusetts Medical Society.

Conferences were held with students from Harvard School of Public Health and with visitors from many states and foreign lands each year. Time spent with these visitors is more than compensated for by the new points of view obtained from such contacts.

Members of the Division attended regular sessions of the Clinico-pathological Conferences at the Children's Medical Center, the Floating Hospital, and Mount Auburn Hospital; Meetings of the New England Pediatric Society, Massachusetts Medical Society, the Massachusetts and National Public Health Associations, and many others. Several members of the staff attended courses in Maternal and Child Health both within the state and in other parts of the country.

Motion picture films have been in constant demand by various lay, professional, and official groups. The most popular films are those on nutrition, care of the teeth, tuberculosis, posture, and the "cleanliness series" for children. Several radio talks and lectures have been presented.

The Director of Maternal and Child Health served as chairman of the library committee and as editor of *The Commonhealth* as long as it was printed. Due to war shortages the last printing was in 1942 covering the activities of the Division for 1941. In 1944 the library was transferred to the Division of Administration under the Bureau of Health Information.

10. Legislation.

Much time was spent by members of the staff on proposed legislation, especially on recommended changes in the law concerning school medical examinations from an annual examination to spaced examinations; on laws relating to employment of pregnant women in industry; and on the changes in the premature law. A committee containing the Director and Assistant Director, and the Director of the Division of Local Health Administration laid plans for the administration of the Federal Health Bill when, and if, it is passed.

11. Personnel Changes.

During the illness and after the death of Dr. M. Luise Diez the duties of Director were taken over by Dr. Florence L. McKay, who, in November, 1942, became Acting Director of the Division. In January, 1943, Dr. McKay was made Director, and the position of Assistant Director was filled in August, 1942, by the appointment of Dr. Sallie Saunders.

Vital Statistics

Massachusetts

Year	Birth Rate per 1,000 Population	Death Rate per 1,000 Population	Infant Mortality Rate per 1,000 Live Births		Maternal Mortality Rate per 1,000 Live Births
			(Under 1 Yr.	Under 1 Mo.)	
1942	19.2	11.7	31.8	23	2.1
1943	19.8	12.5	34.3	22	2.0
1944	18.0	11.8	33.0	22	1.8
1945	16.9	11.3	31.8	22	1.9
1946	21.3	11.3	30.9	23	1.3
1947	23.3	11.2	28.3	21	1.0
1948	21.4	11.3	26.4	20	0.7

Special Projects

Under Federal Reserve Fund B, through the Children's Bureau, nine projects have been organized through the Division of Maternal and Child Health.

1. *Pediatric Nursing Course* — A special course in pediatric nursing was organized by the Children's Bureau, Boston University, and this Division in the Fall

of 1944. Nurses from all parts of this state and many other states have attended. The course has affiliation with the Children's Medical Center.

2. *Maternity Nursing Course* — The course in Maternity Nursing at Boston University was begun in the Fall of 1947. It is conducted on the same basis as the Pediatric Nursing Course, and has affiliation with the Boston Lying-In Hospital.

3. *Harvard School of Public Health Course in Maternal and Child Health* — Through a special grant of $69,072.00 the program for teaching and research into public health problems of maternity, infancy, and childhood was expended to such an extent that a complete training unit for specialists in maternal and child health and crippled children's services was obtained. On January 1, 1948 a major improvement in teaching facilities took place when the new Child Health Division of the Children's Medical Center was opened with the head of the Department of Maternal and Child Health as its Director. A variety of clinics are conducted in this unit which provide small numbers of children under conditions permitting thorough basic training and detailed demonstration of health services. Of a total of 122 full-time and part-time students enrolled in the 1948 class, 42 took the basic lecture course in the Department, 29 the course in administration of maternal and child health services and 26 took one or more of the seminars.

4. *Study of Pediatric Care of Children of Harvard Veterans* — This project is sponsored by the Massachucetts General Hospital under funds from the Children's Bureau, and is to serve as a pilot study in a nation-wide investigation of cost of pediatric care. The Director of the Division of Maternal and Child Health is directly responsible for administrative supervision of the project. Services are extended through child health conferences, domiciliary pediatric and consultation service, out- and in-patient hospital services. Consultation service is given by practicing physicians who are licentiates of the American Board of Pediatrics. Hospitals which are participating in the project are the Massachusetts General Hospital, the Mount Auburn Hospital, the Floating Hospital and the Children's Medical Center. The staff includes a part-time medical director, a full-time assistant director, two pediatricians, two public health nurses, and statistical and clerical help. The children eligible for care were those of Harvard veterans whose fathers were attending the university in Cambridge and the unit at Harvardevens in Ayer. In September, 1948, children of all Harvard students, veteran or non-veteran, were made eligible. In June, 1949, Fort Devens was closed and the Devens portion of the study was brought to a close. In June, 1950, the entire project will be terminated. During the first nine months of the study the services rendered were as follows: total 8358, office 3740, domiciliary 752, hospital 264, telephone advice 3529, unspecified 73.

5. *Medical Social Work Training Project* — This project was organized in the Spring of 1948 and provides for the training of medical social workers through cooperation of the Bureau of Medical Social Work of the Department of Public Health with the three schools of social work in Boston — Simmons College, Boston University, and Boston College. The deans of the three schools, the Commissioner of Public Health, the Chief of the Department's Bureau of Social Service, and the Director of Maternal and Child Health form a Technical Committee to assist in the development of the project, and the selection of professional personnel. The director of the project is the Chief of the Bureau of Social Service. Administrative supervision is given by the Division of Maternal and Child Health.

6. *Fellowship in Rheumatic Disease* — Following conferences held between Dr. Getting, Dr. Curtis, Dr. Massell, Dr. Rafuse, and Dr. McKay in May, 1947, two fellowships in rheumatic disease were established. The fellowships are given through the Harvard Medical School, the Children's Medical Center, and The House of the Good Samaritan, the Pediatric Department of Harvard Medical School, and the State Department of Public Health. Only candidates who plan to go into the public health or teaching fields are eligible. Two fellowships were granted in each of the years 1948, and 1949.

7. *Scholarships in Pediatric Nursing* — Plans with the Boston University School of Nursing and the Children's Hospital for this scholarship, to begin late in the fiscal year 1948–1949, came to fruition with the selection of a graduate nurse who completed special training in June, 1949.

8. *Dental Health Projects* — Two new dental health projects were approved by the Children's Bureau late in the fiscal year 1948–1949. One is a cooperative project with Tufts Dental College in the training of dentists in oral pediatrics. The second is a cooperative project with Forsyth Dental Infirmary for the training of ancillary personnel in certain phases of dentistry for children. This is the first project of its kind to be developed in the United States and is, therefore, experimental in nature. The training period will start in September, 1949, and will be of two years duration. A three-year evaluation period is planned to follow the training period.

9. *A Study of Emotional Aspects of Pediatric Hospital Care and the Value of Parental Participation* — This project, involving primarily the nursing aspects, was set up for an experimental six-months' period by the Children's Hospital and the Boston University School of Nursing, and this Division. It was approved by the Children's Bureau as of January 1, 1949, and was carried through the remainder of the fiscal year.

10. *Survey of Child Health Services* — Another project was the *Survey of Child Health Services* in Massachusetts, sponsored by the American Academy of Pediatrics, and comprising a part of a nation-wide investigation of the status of child care in the United States. This project was begun in May, 1946 and was completed by the publication of its report in June, 1949, entitled *Health Services for Massachusetts Children*. The Division of Maternal and Child Health participated in planning, in submitting material on child health services, and in furnishing funds to cover rental of office space, telephone service and other services and supplies.

DIVISION OF COMMUNICABLE DISEASES
CONSOLIDATED REPORT 1942–1949

Roy F. Feemster, M.D., Dr. P.H., *Director*

General Statement

The large fluctuations in the total number of cases of communicable diseases reported to the Department are usually due to the prevalence or lack of prevalence of some of the more highly contagious diseases of childhood. The period was ushered in by an increase in prevalence of several of these diseases reaching a high for the period in 1943 (137,986 cases) due primarily to an epidemic of German measles accompanied by some increase in measles and scarlet fever. During the next four years, the general tendency was downward due to a fall in these highly infectious diseases broken only by an epidemic of measles in 1946. After a low of 76,247 cases in 1947, there was an increase to 105,216 in 1948 due largely to increases in measles and mumps and, to a less extent, scarlet fever. The following year there was another drop due primarily to a recession in the diseases which had been high the year before.

The period was also characterized by a marked increase in meningococcal meningitis early in the period, a rise in malaria in the middle of the period, and a rise in diphtheria at the end of the period. The explanation for these will be found later in this report. Typhoid fever was held at a very low level and smallpox did not invade the State even in these troublous times.

Prevalence of Certain Diseases

Chicken pox. This disease is either being better reported by physicians or is becoming more highly prevalent. The total number of cases did not drop below 10,000 during the period and twice exceeded all previous records, first in 1944 with 19,489 cases and second in 1949 with 22,132 cases.

Diphtheria. After reaching 123 cases, the lowest figure on record, in 1941, diphtheria tended to increase and remained high to the end of the period. While various parts of the State contributed irregularly to the high totals, particularly the larger cities of the Merrimack Valley and for a time New Bedford and other more populous areas, the bulk of the cases for the period occurred in the Boston Metropolitan area. During the last two years, Boston has had a disproportionate share of the number of cases with Somerville, Cambridge, Chelsea, Revere and other nearby communities contributing to the total.

Renewed efforts in broadening the immunization program appear to have been more effective in reducing the prevalence in the remainder of the State than in the Boston Metropolitan area. One reason for the continued high figures has been a shift in the proportion of cases to adolescents and adults, who are not being affected by current immunization programs.

Dysentery, Bacillary. The annual fluctuations in the number of cases of bacillary dysentery are due primarily to outbreaks in State institutions. Usually 50 to 100 cases are discovered in the general population, the remainder coming from institutions. The high figures for the early years of the period were followed by a decline to a low level of only 55 cases in 1949.

Encephalitis, Infectious. Although a varied number of cases are reported to the Department each year, nothing has occurred during the period to indicate that any of the epidemic viruses have been active in the State. A proportion of the cases reported are apparently post infection encephalitis. Some of them may be primary infections due to Coxsackie viruses, which also cause confusion in the diagnosis of other conditions such as poliomyelitis, meningitis of undertermined origin, etc.

German Measles. This disease which tends to be quiescent for long periods of time reached epidemic proportions in 1943 for the first time since 1935. Two minor waves were observed in 1946 and in 1949.

A study carried out among adult females who had the disease in 1943 uncovered congenital defects in several infants whose mothers had the disease early in pregnancy. The study was begun more than a year after the outbreak occurred.

Hepatitis, Infectious. This disease was not made reportable until 1949. No large outbreaks apparently occurred during this year.

Gastroenteritis. Most of the outbreaks of diarrhea which occur are usually included under this classification or under that of food poisoning. Many outbreaks are due to staphylococcus enterotoxin but many are also due to unrecognized etiologic agents. A list of the outbreaks which have been brought to the attention of the Department will be found in the tabulation of outbreaks later in this report.

Malaria. The number of cases of malaria reported annually rose from the level of approximately 10 a year to a high of 1031 in 1945. Very few of these cases were primary infections. Most of them were relapses in military personnel or in civilians returning from service in areas where malaria is prevalent. So far as we could determine, none of the cases were contracted in Massachusetts. With the cessation of the war, the prevalence again declined to approximately 10 cases a year.

Measles. This disease reached high levels in three of the eight years of the period with either one or two lower years intervening. Deaths attributable to the disease remained under 20 per year except in 1943 when there were 21 deaths.

During the period, immune globulin from the Red Cross and other blood programs has largely replaced the use of placental extract.

Meningitis, Meningococcal. This disease rose suddenly at the onset of the war not only in Massachusetts but throughout the country. It reached its highest level with 736 cases reported in 1943, thereafter subsiding gradually. Since an attempt was made to investigate every case reported, cases were not classified finally as meningococcal infections unless there was good laboratory evidence. Questionable cases were classified as meningitis of undertermined origin. In spite of this close scrutiny of cases, the 1943 prevalence is the highest that has ever been reported in the State.

During the period, sulfonamides have replaced all other methods of treatment of meningococcal infections except that some of the antibiotics are now being tried. This has tremendously lowered the fatality rate. Among robust individuals in the armed services, the rate fell as low as 1%. However, because many cases are not recognized early, the fatality rate in the general population ranges up to 30%.

Meningitis, Other Forms. The year 1942 was the first full year in which all forms of meningitis were reportable. In addition to meningitis due to the Pfeiffer bacillus, records were kept in regard to infections due to the pneumococcus, streptococcus, staphylococcus, and other causative agents. Since meningococcal meningitis has returned to normal levels, the number of cases due to the Pfeiffer bacillus and pneumococcus sometimes almost equals the number due to the meningococcus.

Mumps. Formerly, this disease showed a higher prevalence every four or five years. During this period, however, the waves have come every three years. In 1948, the total number of cases reached 17,037, the highest ever reported. During the latter part of the period, Enders' work on serological and skin tests to determine supposed immunity to the disease has made it possible to recognize infections without the usual swelling of the salivary glands.

Ophthalmia Neonatorum. Formerly, reported cases of suppurative conjunctivitis were tabulated with ophthalmia neonatorum. The experience gathered over the years indicated that no useful purpose was being attained by the reporting of this condition, and it was removed from the list of reportable diseases in 1948. This leaves only infections of the eyes of infants under two weeks of age in the reportable list. Already the number of eye infections reported had dropped from nearly 1,000 per year in 1940 to under 200.

Poliomyelitis. Since this disease became reportable, a rise to a high level had been observed every four to seven years. During this period, however, the time between years of high prevalence was not only prolonged to nine years but the peak in 1945 was not as high as expected. This was followed, however, four years later by a rise to the second highest level ever reported.

In interpreting this trend, however, it must be emphasized that there has been a marked increase in the proportion of non-paralytic cases reported, reaching in 1949 almost 50%.

Each year the organization of the agencies caring for persons with the disease is being better coordinated, the public is being educated in regard to which measures are reasonable so that the outbreak of 1949 was handled with much less panic among the public than previous outbreaks.

An explanation for some of the confusing conditions which have been called poliomyelitis may have been discovered in the isolation of the viruses of the Coxsackie group in one-day old mice. Epidemiological observations indicate that this group of viruses may have been unusually prevalent during the 1948 season.

Rabies. No human cases or deaths from rabies have occurred during the eight-year period. This is due to the disappearance of animal rabies from the State. Only 20 rabid animals were discovered in 1942, five in 1943, and since that date the only animals found with the disease in the State have been those which were infected beyond our borders, except for one dog in Longmeadow in 1949.

There is increasing evidence that the disease was eliminated by the program of inoculating dogs with rabies vaccine.

Rocky Mountain Spotted Fever. Eight cases of this disease have occurred during the eight-year period, all of them in the area infested with the wood tick. Three of the cases have occurred in Chatham, two in Dennis, one in Barnstable, and two in Oak Bluffs. This marked localization indicates that the infection of the wood tick in Massachusetts is limited to these areas.

Salmonellosis. The number of cases of infection with Salmonella organisms reported does not include all of the cases which have occurred. Only those cases which have been bacteriologically proved are included in the figures. Numerous cases which epidemiologically appear to be caused by the same agent were not officially reported. This is particularly true of some of the cases which occurred in food-borne outbreaks.

Many of the cases continue to be single sporadic cases or small family outbreaks. An accompanying table gives the distribution of the cases by the species of Salmonella. S. typhimurium continues to be the most frequent organism found.

Scarlet Fever. The beginning of the eight-year period was characterized by a high prevalence of scarlet fever, the peak being reached in 1943 with 15,400 cases. The disease declined, however, to 4,424 cases in 1947 and has risen only slightly above that level in the last two years. Deaths continue to decline due largely to the use of the sulfa drugs and antibiotics in the treatment of complications.

Smallpox. No cases of the disease occurred in the State during the period in spite of the rapid movement of civilians and military personnel. No cases of smallpox have occurred in the State since 1932.

Tularemia. Eighteen cases of this disease have been reported during the period, all of them from the area of high wood tick prevalence except two, one of which was probably not tularemia. This concentration in the wood tick area indicates that the tick probably plays an important role in the spread of the disease. The Department continues to oppose the importation of cottontail rabbits from western states.

Typhoid Fever. Typhoid fever dropped to 50 cases for the first time in 1942, the first year of the period, and fell immediately below this level thereafter. In 1945, only 18 cases were discovered.

These cases are certainly due to contact with permanent typhoid carriers who have had the disease sometime in the past. Approximately one-fourth of the cases are explained by discovery of the carrier. The comparative record for the discovery of the carriers is shown in the following table:

Year	Cases of Typhoid	Carriers Added to List	Rate per 100 Cases	Carriers Found on Investigation of Cases	Rate per 100 Cases	Epidemiological Units	Per Cent of Units in Which Carrier Was Found
1940	86	19	22.1	12	13.9	59	20.3
1941	68	22	32.4	18	26.4	63	28.6
1942	50	20	40.0	14	28.0	42	33.3
1943	34	17	50.0	8	23.5	33	24.2
1944	32	9	28.1	7	21.9	31	22.6
1945	18	7	38.9	4	22.2	16	25.0
1946	33	11	33.3	6	18.2	31	19.4
1947	23	9	39.1	4	17.4	20	20.0
1948	33	12	36.4	9	27.3	28	32.1
1949	30	6	20.0	–	0.	25	0.

For the years 1942 through 1949, 91 carriers were added to the carrier list: 53 were found on investigation of typhoid cases; 13 were convalescents who had continued to show positive stools for more than a year; 6 moved into Massachusetts from other states. There were 19 discovered accidentally by laboratory examinations.

The manner of discovery of the last 19 carriers was: 5 in routine examinations of patients hospitalized for other conditions; 5 in routine examinations of patients in mental hospitals; 2 in routine examinations of contacts of a newly discovered carrier; 3 in routine examinations of hospital employees; 2 at the time of gall-bladder operations; 1 at the time of a community outbreak of bacillary dysentery; 1 at post mortem — (examination because son-in-law suspected case was a typhoid carrier).

During the period, 95 carriers were removed from the list: 60 carriers died; 16 moved away; 2 disappeared; 12 were removed following 12 monthly negative stool examinations and a negative bile; 5 were removed by special arrangements varying slightly from the usual policy.

There were 169 carriers on the list on January 1, 1942 and 165 on the list January 1, 1950.

It has been calculated that there are less than 700 carriers in the State at the present time. It is expected that the number will drop to 200 by 1960 since most of the carriers are over 60 years of age and only one replacement per year is being furnished by current cases.

Undulant Fever. The number of cases of this disease reported annually has been stabilized at 40 to 50. Most of these continue to occur in rural areas in the State. A few result from the handling of carcasses of dead animals in meat packing plants. The high percentage of milk which is pasteurized in the State keeps down the number of cases particularly in urban areas where regulations requiring pasteurization are in force.

Whooping Cough. The period was ushered in with a high prevalence of this disease but there was a decline during the last of the period, dropping almost to 4,000 cases in both 1944 and 1949. It is suspected that the increasing use of immunization against pertussis is having some influence upon the prevalence of the disease.

Reorganization

At the beginning of the period, the District Health Officers were a part of the Division and their activities were supervised by the Director. Early in the period, steps were taken to transfer the District Health Officers to a newly created Division of Local Health Administration, along with the transfer of other field personnel from other divisions. This resulted in a broadening of the field of activities of the District Health Officers and many new programs were placed upon their shoulders. Even with a competent subsidiary staff, these programs could not be shouldered without neglecting some of the activities in connection with communicable diseases which they formerly carried, when most of their time was available for this purpose.

During the period, the Wassermann Laboratory was also transferred to the Division from the Division of Biologic Laboratories. This Laboratory and the Bacteriological Laboratory were moved from their former locations at the Harvard Medical School and in the State House to a building at Forest Hills owned by Harvard University. This move gave the laboratories more satisfactory quarters and allowed them to take on new activities, such as the Rh typing of blood specimens from pregnant women financed at first by private funds, later by funds authorized by the Legislature.

With the passage of the Hospital Licensing bill early in the period, the licensing of dispensaries was transferred to the unit handling the licensing. It is no longer necessary to license dispensaries in authorized hospitals so that the number of dispensaries was greatly decreased.

Epidemiology

During most of the period, the shortage of physicians in the epidemiological positions aggravated the situation caused by diverting the activities of the District Health Officers to a wider field so that it has not been possible to give as much assistance to local boards of health as formerly in making epidemiological investigations. Preparation of scientific papers has also been difficult because of this shortage

of personnel. It was not until July 1, 1949 that all of the positions were filled on a full-time basis. Since that time, much of the unfinished work which had been accumulated has been taken care of.

Special Projects and Studies

Scarlet Fever Immunization. The scarlet fever immunization program carried on since 1932 was halted early in the period, due first to lack of personnel in the Biologic Laboratories to continue the search for a more efficient immunizing agent, and later by a shortage of personnel resulting from the demands of war activities.

Pneumonia Studies. The studies of the value of serums for pneumococcal pneumonia which had been rendered less important by the introduction of the sulfonamides were discontinued when the antibiotics in combination with the sulfonamides replaced serum treatment.

German Measles Study. Beginning in 1944, a study of congenital defects which resulted from pregnancies in women who had german measles in 1943 was undertaken. The study was completed and a paper prepared in the fall of 1946.

Diarrhea of the Newborn. The Division worked in cooperation with the Division of Hospital Licensing in 1946 and 1947 in investigating outbreaks of epidemics of infectious diarrhea of the newborn and in setting up the procedures in maternity wards to prevent the occurrence of such outbreaks. Excellent results in informing hospitals in regard to the problem were obtained in a series of four one-day conferences held in different portions of the State culminating in a large meeting in Boston. The Division took the responsibility of seeing that the manuscripts of these conferences were duplicated for distribution to hospitals within the State as well as out-of-state health departments. It is more than a coincidence that no maternity wards had to be closed during the two and one-half years following these conferences and the continued check on the procedures carried out in the hospitals.

Poliomyelitis. In 1946, a study of poliomyelitis authorized by Chapter 93 in the Resolves of that year was carried out. It consisted largely of a thorough epidemiological study of an outbreak in a summer camp and an analysis of the records of the Division regarding poliomyelitis. The work was made the subject of a report to the Legislature and two papers were published in scientific journals.

In 1947, $5,000.00 was placed in the budget of the Division to continue laboratory studies on poliomyelitis, and the succeeding year a position of Assistant Bacteriologist was authorized with some expense funds. These studies have been carried out during the remainder of the period mainly at the Virus Laboratory at Harvard Medical School on specimens collected in the field by our own epidemiologists.

Diphtheria Studies. In 1947, a series of studies on the practicability of immunizing high school students without preliminary Schick tests was undertaken. It has been demonstrated that the plan is practicable with reduced doses which do not produce undue reactions. It is expected that within another year the recommendations for the immunization of high school students can be made.

Milk Regulations. During the years immediately prior to the war, numerous communities had been encouraged to pass regulations requiring the pasteurization of milk. By 1942, 85 communities had adopted regulations that all milk sold be pasteurized or certified. In this year inability to obtain pasteurization equipment due to war priorities stopped the activities in this line and they were not renewed until 1946. During the remainder of the period, 26 other communities took action bringing the total to 111 by the end of 1949. Preparations are being made to urge all communities of over 5,000 and all suburban communities of over 1,000 population to pass similar regulations.

Wood Tick Study. In 1948, the Legislature authorized a study to discover methods of controlling wood ticks in the State. By the time the funds became available, observations could be made only at the end of the season. A renewal of the study was authorized in 1949 to be carried out in 1950.

Communicable Disease Information. As a part of the program of keeping boards of health and health workers in general informed in regard to communicable disease problems, a weekly publication was begun in 1944 carrying not only a statistical summary of the communicable diseases for the previous week but also brief dis-

cussions of current problems. This publication has become quite popular and other state health departments have asked for permission to reprint articles appearing in it.

Cooperation of Military Authorities. During the war, the Division spent much of its time cooperating with military authorities in dealing with communicable diseases of various kinds both inside of military reservations and in the areas immediately surrounding them.

Revision of Regulations

The isolation and quarantine requirements for communicable diseases were revised both in 1944 and in 1948. In each instance proposed revisions were submitted to an Advisory Committee of well-informed physicians who suggested a number of changes in the proposals. Although local boards of health may require more stringent regulations, the majority of them have followed our regulations quite closely.

Bacteriological Laboratory

During the early part of the period, this Laboratory continued to operate in cramped quarters in the State House. In 1946, when the Chief of Laboratory who had been in charge since 1914 retired, this Laboratory was placed under the supervision of a physician with the title of Assistant Director. Early in 1947, the Laboratory was moved to quarters formerly occupied by the First Service Command Laboratory of the Army, and thereafter it was possible to take on new programs.

The work of this Laboratory increased considerably during the period. The number of specimens examined annually increased from just under 40,000 in the first half of the period to over 90,000 in 1949. The bulk of this increase was due to blood grouping and Rh typing on blood bank bloods begun in 1946 and of the same tests on prenatal specimens begun in 1947. The cost of carrying out the tests on blood bank specimens was assumed by the American Red Cross in 1949 and the burden is to be removed from the Laboratory in 1950. There was also a 50% increase in the number of specimens for tuberculosis within the last four years, and a slightly less increase in the number of specimens for diphtheria. The increase in the tuberculosis specimens was due to the accelerated program for discovering cases of the disease, and the increase in diphtheria specimens was due to an increased prevalence following the war.

The number of specimens does not give a complete picture of the increase of work, however, since the number of examinations increased from approximately 65,000 in the early years of the period to 185,000 tests in 1949. This increased burden has been assumed with only minor increases in personnel. We must face the prospect of either eliminating some of these very necessary services or of obtaining additional positions so that the burden can be carried. The above figures also do not include the work involved in preparing and sending out check specimens to the laboratories in the Approval Program.

New Tests Offered. As continued research makes new tests available for the diagnosis of communicable diseases, physicians and boards of health expect the Department to make these tests available through our Laboratory. It has been impossible to offer all of the tests which would contribute to the health of the people of the State but certain ones appear to be unusually important.

The heterophile antibody tests for the diagnosis of infectious mononucleosis was offered beginning in 1944 because this disease is so frequently confused with undulant fever.

Examinations of shipped specimens from patients with gonorrhea by culturing methods was begun on an experimental basis in 1944, but was discontinued in 1946 because it was felt that the service was unreliable on shipped specimens.

In 1946, after repeated requests that the Department perform Rh testing and blood grouping tests on pregnant women, private funds were found to begin this work. In 1947 one position was put into the State budget to assist in carrying this burden, and in 1949 a second position was added. One of the reasons why the Laboratory is heavily overburdened is that these two positions do not quite take care of this load.

The diagnosis of virus diseases assumes greater importance every year. In 1946, the Laboratory began paying for virus examinations carried out in the Virus Lab-

oratory at the Harvard Medical School from a few specimens sent in by physicians. In 1948, routine testing for influenza and mumps was transferred to the Bacteriological Laboratory but virus tests for other diseases continued to be carried out at the Harvard Medical School and the cost assumed by the Laboratory.

Salmonella Typing. Throughout the period, typing of all Salmonella organisms isolated from human illness has been available through the courtesy of the Typing Center of the Beth Israel Hospital in New York City. This service has been performed by that hospital without any cost to the State. This information has been very valuable in planning the control of this disease in Massachusetts.

Laboratory Approval. The program for approving laboratories meeting proper standards was well under way by the beginning of this period. Because many laboratories were having difficulty in obtaining approval for all of the tests for which they applied, no list of approved laboratories was issued until 1946. Since that time a new list of current laboratories has been issued annually. In 1946, the law was changed to add blood grouping and Rh typing to the tests for which approval could be granted, as well as certain sanitary procedures such as the examination of eating and drinking utensils, milk samples, and water and sewage samples. The Divisions of Food and Drugs and Sanitary Engineering have cooperated in granting approvals on the last three tests.

Wassermann Laboratory

This Laboratory has carried a heavy burden of routine tests throughout the period. The number of specimens was highest in 1942 when the Laboratory was carrying out tests for the draft boards. The number of specimens declined from the peak of over 760,000 in 1942 to about 530,000 in the last three years. This is apparently the level at which requests for serological tests for syphilis will be requested on a continuing basis.

This Laboratory was moved from the Harvard Medical School to the Bussey Building at Forest Hills in 1947 where it has more adequate quarters. The heavy burden of routine tests makes research work difficult but the Laboratory has continued to carry on investigations aimed toward improving its technique. The Laboratory has been evaluated annually by the Public Health Service and rates high among state laboratories in efficiency and accuracy.

Publications

During this period, the Division was responsible for the publication of twenty articles on Communicable Diseases.

TABLE I — *Outbreaks — 1942*

Disease	Month	Location	Cases	Suspected Vehicle	Etiological Agent	Remarks
Diarrhea, infantile	October	Fall River	Not known	Unknown	Unknown	Cases occurred among newborn babies at a local hospital. Number of cases unknown.
Dysentery	September	Wrentham	About 300	Unknown	Sonne	Outbreak at State School.
Dysentery	November	Waverley	6	Unknown	Flexner	Cases occurred in the hospital building; 2 sub-clinical infections.
Gastroenteritis	March	Training Ship	36	Minced ham and eggs	Unknown	36 of 120 cadets became ill 3 hours after breakfast.
Gastroenteritis	April	Rutland	71	Potato salad	Staph. ent.	Outbreak occurred among employees and patients at State Hospital.
Gastroenteritis	April	Canton	174	Egg salad	Staph. aureus	Cases occurred in a public school after lunch. The same strain of Staph. aureus was isolated from nose and throat cultures.
Gastroenteritis	April	Chelsea	25	Unknown	Unknown	Cases developed in individuals, mostly children, living in a small area.
Gastroenteritis	May	Lowell	30	Unknown	Unknown	30 students of 100 became ill after attending a school banquet.
Gastroenteritis	May	Wellesley	41	Unknown	Unknown	During a period of 10 days, 42 students and employees developed nausea and diarrhea. One food handler at the college had toxigenic Staph. aureus in nose and throat. No food available for examination.
Gastroenteritis	May	Pittsfield	10	Strawberries and cream	Unknown	10 of 16 persons developed symptoms after eating at a local inn.
Gastroenteritis	June	Boston	31	Unknown	Unknown	31 of 105 patients at a State Hospital became ill. Stool cultures showed no intestinal pathogens.

Gastroenteritis	June	Pittsfield	75	Corned beef	Staph. aureus	After a wedding reception, 75 of the 150 guests became ill.
Gastroenteritis	July	Cambridge	22	Cream-filled pastry	Staph. aureus	Pastry purchased at small Italian bakeshop.
Gastroenteritis	July	Grafton	110	Warmed-over hash	Staph. aureus	110 patients in the female wards at the State Hospital developed gastroenteritis following a noon meal.
Gastroenteritis	July	Worcester	17	Sandwiches	Staph. ent.	17 of 50 to 75 persons who had attended a wedding supper became ill.
Gastroenteritis	July	Lowell	6	Fumes	Unknown	6 of 15 workers in a brass foundry became ill possibly due to lead poisoning from fumes.
Gastroenteritis	August	Baldwinsville	70	Unknown	Unknown	Cases occurred at the Hospital, Cottages among patients nurses and kitchen help.
Gastroenteritis	August	Brockton	13	Unknown	Unknown	13 individuals developed gastroenteritis. The cook, who became ill a week previous, was found to have a Salmonella infection.
Gastroenteritis	August	Cuttyhunk	8	Unknown	Unknown	During the summer a mother, 2 children, 3 visitors, a maid and a nurse were ill. Stool specimens obtained from 5 of the individuals after recovery were negative.
Gastroenteritis	August	Townsend	20	Unknown	Unknown	20 girls developed mild symptoms while at a Vinton Pond camp.
Gastroenteritis	August	Worcester	8	Creamed chicken	Unknown	8 individuals of the night crew of a hospital developed gastroenteritis after eating creamed chicken.
Gastroenteritis	September	Foxboro	About 25	Unknown	Unknown	Cases occurred in State Hospital. First case was in the baker.
Gastroenteritis	September	Worcester	180	Cooked ham	Staph. aureus	Staph. aureus isolated from ham and from the nose and throat of food handler and one patient.

TABLE I — *Outbreaks — 1942*—Concluded

Disease	Month	Location	Cases	Suspected Vehicle	Etiological Agent	Remarks
Gastroenteritis	October	Boston	29	Chopped ham sandwiches	Unknown	Civilian employees at Army Base became ill after eating at post cafeteria.
Gastroenteritis	October	Wellesley	20	Unknown	Unknown	About 20 girls in a dormitory building at the college became ill. The onsets were not simultaneous.
Gastrocnteritis	October	Winthrop	7	Unknown	Unknown	7 of 22 nurses and attendants developed symptoms. Onsets were not simultaneous.
Gastroenteritis	October	Worcester	About 25	Unknown	Unknown	Cases occurred at an industrial plant.
Gastroenteritis	November	Belmont	10	Fricasseed chicken	Unknown	Family oubtreak.
Gastroenteritis	November	Boston	9	Pizza	Sodium fluoride	Illnesses followed eating pizza purchased at a tavern.
Gastroenteritis	December	Winthrop	5	Pressed ham sandwiches	Unknown	Cases occurred among men having sandwiches from the same source. No meat was available for examination.
Gastroenteritis	December	Medfield	150	Unknown	Unknown	Employees and patients at State Hospital became ill after Christmas dinner.
Gastroenteritis	December	Boston	140	Chicken and chicken broth	Staph. aureus	Outbreak among staff members and patients at Marine Hospital.
Gastroenteritis	December	Worcester	5	Turkey	Unknown	Family outbreak. All members became ill after Christmas dinner.
Jaundice, catarrhal	Feb.-March	Weymouth	About 10	Unknown	Unknown	Cases occurred at a hospital among nurses, employees and patients.
Salmonella infections	January	Quincy	3	Unknown	S. newington	In the maternity ward of a hospital. There was one death.
Salmonella infections	August	Boston and vicinity	15	Infected lamb	S. typhimurium	Cases occurred after an Albanian picnic held in New Hampshire.

Salmonella infections	September	Waverley	5	Unknown	S. senftenberg	Cases occurred at State School in the tuberculosis ward.
Sore throat	June	Winchendon	Not known	Unknown	Unknown	Certain employees and one guest at a local inn developed sore throats. Raw milk used by employees suspected.
Sore throat	July	Gloucester	12	Unknown	Unknown	A series of sore throats occurred at a summer "settlement camp."

TABLE I — *Outbreaks — 1943*

Disease	Month	Location	Cases	Suspected Vehicle	Etiological Agent	Remarks
Anterior poliomyelitis	September	Various communities	12	—	—	Cases occurred among campers who had been at a Scout Camp in the Berkshires. 9 were Massachusetts residents, 1 out of state, and 2 in the family of one of the campers.
Diarrhea, infantile	June	Brockton	6	Unknown	Unknown	2 outbreaks with a total of 6 cases with 3 deaths occurred among infants in hospital.
Diarrhea, infantile	September	Lowell	6	Unknown	Unknown	Cases occurred among infants on the maternity ward of a hospital. All cultures were negative.
Diarrhea, infantile	October	Quincy	12	Unknown	Unknown	Brunt of epidemic occurred in premature nursery. 4 deaths.
Dysentery	January	East Boston	6	Unknown	Sonne	Family outbreak.
Dysentery	July–Aug.	Tewksbury State Hospital	70	Unknown	Sonne	Apparently spread by contact.
Dysentery	August	Malden	3	Unknown	Sonne	4 girls visiting from Vermont became ill day after arrival.
Dysentery	August	Woburn	20	Unknown	Sonne	Cases in a "home" caring for children.
Dysentery	September	Wakefield	23	Unknown	Sonne	Cases in a "home" caring for children.
Dysentery	October	Malden	6	Unknown	Sonne	Family outbreak.
Dysentery	October	Brockton	6	Unknown	Sonne	Family outbreak.
Dysentery	December	Worcester	32	Unknown	Flexner	Cases at State Hospital.
Dysentery	December	Lowell	6	Unknown	Flexner	6 cases with 2 deaths occurred in the male ward in a home for elderly indigent patients.
Gastroenteritis	January	Watertown	5	Unknown	Unknown	Cases occurred among persons eating at a cafeteria in a war plant.

Gastroenteritis	February	Revere, Saugus, Winthrop, Lynn	13	Cream puffs	Staph. aureus	13 persons out of 16 in 4 families became ill after eating cream puffs prepared at a Lynn bakery.
Gastroenteritis	March	Fall River	18	Chicken	Unknown	Cases occurred among high school students following a dinner.
Gastroenteritis	March	Northampton	Not known	Probably cream-filled eclairs and doughnuts	Unknown	Cases developed 4 hours after eating the eclairs and doughnuts. None of the products were available for examination.
Gastroenteritis	March	Somerville	6	Chicken	Unknown	6 of 7 persons in a single household became ill after eating a meal.
Gastroenteritis	March	Waltham	15	Unknown	Unknown	Persons working in an industrial plant became ill after eating at the plant cafeteria.
Gastroenteritis	March	Worcester	30	Probably corned beef	Probably Staph. ent.	Persons became ill after eating in the plant cafeteria of an industrial plant.
Gastroenteritis	April	Waltham	39	Unknown	Unknown	Cases occurred in patients, nurses and other employees at a local hospital.
Gastroenteritis	May	Belmont	6	Probably baked beans	Unknown	Family outbreak.
Gastroenteritis	May	Eastern Mass.	At least 50	Custard pie	Hem. staph.	Cases widely distributed throughout eastern Mass. among persons who ate custard pies made in a Worcester bakery . 1 death.
Gastroenteritis	June	Worcester	19	Probably sandwiches	Unknown	Cases occurred in a local orphanage. Sandwiches which were 2 days old were served.
Gastroenteritis	June	Beverly	28	Ham	Staph. aureus	19 Rotarians, 5 guests of club, and 4 employees became ill after lunch at a local club.
Gastroenteritis	June	Worcester	52	Unknown	Unknown	Cases occurred among nurses, private patients and ward patients at City Hospital on 2 different occasions.

TABLE I — *Outbreaks — 1943* — Concluded

Disease	Month	Location	Cases	Suspected Vehicle	Etiological Agent	Remarks
Gastroenteritis	June	Cambridge	120	Unknown	Unknown	Cases occurred among students attached to a Naval Unit at a local college.
Gastroenteritis	July	Hubbardston	30	Unknown	Unknown	Cases occurred at a camp for boys.
Gastroenteritis	July	Boston	12	Unknown	Unknown	Cases occurred among nurses at a maternity hospital.
Gastroenteritis	July	Boston	90	Unknown	Unknown	Cases occurred among nurses, employees and patients at a local hospital.
Gastroenteritis	July	Worcester	12	Probably egg salad	Staph. aureus	Cases occurred in an industrial plant.
Gastroenteritis	July	Boston	96	Unknown	Unknown	Cases occurred among students and food handlers of the cafeteria at a local medical school.
Gastroenteritis	July	Attleboro	57	Probably potato salad or raw milk or both	Probably Staph. ent.	Outbreak at defense plant.
Gastroenteritis	August	Pittsfield	75	Unknown	Unknown	Following a picnic of employees of a local firm, 75 of the 113 became ill.
Gastroenteritis	September	Salisbury	205	Possibly lobster salad or chicken salad	Unknown	Symptoms developed after a banquet held at Salisbury Beach.
Gastroenteritis	September	Lawrence	5	Tuna fish salad	Unknown	5 cases in a family became ill after eating tuna fish salad.
Gastroenteritis	October	Watertown	16	Probably cream-filled cakes	Unknown	Employees of an industrial concern became ill after the ingestion of Italian pastry.
Gastroenteritis	Oct.–Nov.	Medford	About 150	Unknown	Unknown	Cases among Naval trainees at a local college. Course and clinical symptoms suggested virus etiology.
Gastroenteritis	November	Salem	7	Cream puffs	Unknown	All became ill after eating cream puffs.

Gastroenteritis	December	Gallups Island (U.S. Maritime Service)	65	Probably baked ham	Staph. ent.	65 men out of 300 became ill after Christmas dinner.
Salmonella	March–April	Danvers State Hospital	34	Unknown	S. typhimurium	Cases among patients. Apparently spread by contact.
Salmonella	August	Baldwinsville	9	Unknown	S. bareilly	Cases among children at Hospital Cottages for Children.
Sore throat Scarlet fever	September	Rowley	28 18	Milk	Hem. strep.	Cases on one milk route. Milker had a sore throat and rash.

TABLE I — *Outbreaks — 1944*

Disease	Month	Location	Cases	Suspected Vehicle	Etiological Agent	Remarks
Cyanosis	July	Revere & Chelsea	9 5	Unknown	Unknown	Episodes occurred at the two hospitals. Investigation failed to reveal the cause.
Diarrhea, infantile	September	Boston	6	Unknown	Unknown	Outbreak at a hospital.
Diarrhea, infantile	September	Cambridge	7	Unknown	Unknown	Outbreak at a hospital. One premature infant died.
Dysentery	September	Fall River	13	Unknown	Sonne	Outbreak at a Children's Home. Cases among children and attendants. Two cases of dysentery occurred among workers at the dairy which supplied milk to the Home.
Dysentery	September	Malden	6	Unknown	Sonne	Small outbreak on Pediatric Ward of a hospital when children were exposed to an unrecognized case of dysentery.
Dysentery	November	Malden	5	Unknown	Sonne	Family outbreak.
Dysentery	December	No. Andover	5	Unknown	Sonne	Family outbreak.
Dysentery	Jan.–Dec.	Danvers State Hospital	37	Unknown	Flexner	Cultures were positive on 37 patients during the year. These cases were not officially reported.
Dysentery	Sept.–Dec.	Met. State Hospital	18	Unknown	Flexner	
Dysentery	Jan.–Dec.	Worcester State Hospital	171	Unknown	Flexner	Endemic thru the year.
Dysentery	June–Dec.	Wrentham State School	36	Unknown	Sonne	
Febrile Disease	July	Boston City Hospital	Unknown	Unknown	Unknown	Cases of unexplained fever and low white counts among nurses and patients. Most of the cases had been swimming at beaches in the vicinity of Wollaston.
Gastroenteritis	January	Boston	7	Lamb	Unknown	Following a supper 5 members of one family and their two guests became ill.

Gastroenteritis	February	Bedford	92	Unknown	Unknown	Cases occurred from Feb. 12 thru 18 among patients and personnel at the Veterans' Hospital. Bacterial examination showed no adequate bacterial cause. Cases were scattered throughout the institution.
Gastroenteritis	February	Boston	30	Unknown	Unknown	Cases occurred in a hospital among nurses, doctors and attendants three hours after a meal. Distribution of cases according to time of onset suggested food-borne disease. No pathogens were recovered from cultures of cases.
Gastroenteritis	February	Fall River	45	Potato and egg salad	Non-hemolytic staphylococci which ferment lactose and mannite and produce coagulose; and green producing micrococo present.	Cases occurred among employees at factory after eating potato and egg salad.
Gastroenteritis	February	Millbury and Grafton	200–300	Unknown	Unknown	Sixty men employed at a local factory became ill on one day. Similar episodes have been reported among the towns people. Well water examination with negative results.
Gastroenteritis	March	Newbury	75	Unknown	Unknown	Cases of gastroenteritis occurred among the students of a private school; spread over several days.
Gastroenteritis	March	Haverhill	57	Egg croquette with cheese sauce	Staphylococcus aureus which ferments mannite but does not produce coagulse.	Fifty-seven out of a total of 300 girl students of a private school became ill after a noon meal.
Gastroenteritis	March	Waltham	Unknown	Unknown	Unknown	Request from Waltham Board of Health to Division of Sanitary Engineering to examine water as there had been a mild epidemic in the city.
Gastroenteritis	April	Boston	About 14	Unknown	Unknown	Illness among employees of a Boston Hotel.
Gastroenteritis	May	Bedford	About 50	Headcheese	Staphylococcus aureus	Outbreak at Veterans' Hospital.
Gastroenteritis	May	Worcester	7	Pot roast	Unknown	Family outbreak. No cultures on food available.

TABLE I — *Outbreaks — 1944* — Continued

Disease	Month	Location	Cases	Suspected Vehicle	Etiological Agent	Remarks
Gastroenteritis	June	Swampscott	About 35	Ice cream	Staphylococcus aureus	Cases occurred at a Hotel among guests and employees.
Gastroenteritis	July	Nantasket	11	Unknown	Unknown	Two neighboring families became ill at about the same time.
Gastroenteritis	July	Becket	150	Unknown	Unknown	Outbreak at a summer camp.
Gastroenteritis	August	Attleboro	5	Unknown	Unknown	Picnic held by an industrial concern for its employees. Five became ill; (2 with paratyphoid).
Gastroenteritis	August	Cambridge	About 20	Chicken salad	Raw chicken showed gram negative lactose fermenting bacilli and staphylococcus albus.	Cases occurred among Naval students at a local university.
Gastroenteritis	August	Fall River	Unknown	Lobster salad	Unknown	800 employees of a local manufacturing concern attended a banquet. A large percentage of these became ill that same night.
Gastroenteritis	August	Nantasket	6	Unknown	Unknown	Family outbreak.
Gastroenteritis	August	Rockport	About 25	Unknown	Unknown	About 25 guests and employees at a summer Inn had gastroenteritis symptoms lasting from 24 to 48 hours. Similar illness common in the town.
Gastroenteritis	August	West Stockbridge	24	Unknown	Unknown	About 24 children at a summer camp became ill with diarrhea and weakness lasting only one day. One counsellor had a positive specimen for Salmonella oranienburg.
Gastroenteritis	September	Webster	About 300	Clam chowder	Unknown	Outbreak at high school.
Gastroenteritis	October	Chelsea and East Boston	6	Eclairs	Staphylococcus aureus	Cases occurred in Chelsea and East Boston in persons who had ingested eclairs made by a Chelsea bakery. Conditions very unsatisfactory at bakery.

						Throat culture from one of chef's helpers was positive for staphylococcus aureus.
Gastroenteritis	October	Westfield	About 25	Unknown	Unknown	Two outbreaks at the State Teachers College among students. Widal and stool cultures on the help and student were all negative.
Gastroenteritis	November	Boston	12+	Chocolate eclairs	Unknown	Twelve nurses at a hospital became ill after eating eclairs at a Boston restaurant. Numerous other cases were reported in Boston in persons who had eaten cream pie and eclairs at this restaurant.
Gastroenteritis	November	Brimfield	Unknown	Unknown	Unknown	A mild epidemic occurred among an unknown number of school children. Milk and water supply examined with negative results.
Gastroenteritis	November	Fall River	5	Veal and Bisquick	Staphylococcus aureus	Five people in one family became ill after a meal.
Gastroenteritis	November	Medford	35+	Cream puffs and chocolate eclairs	Alpha streptococcus	Outbreak followed the ingestion of bakery products purchased from a Medford bakery. 35 cases came to the attention of the Board of Health. Alpha streptococcus isolated from eggs, eclairs, filler, cream puffs and throat cultures on three bakers.
Gastroenteritis	November	Newton	58	Creamed chicken	Unknown	Following a confirmation party at which 70 lbs. of chicken had been served. About 58 of the 77 guests became ill.
Gastroenteritis	November	Northampton	90	Unknown	Unknown	90 students out of 170 in two houses at a college became ill. The assistant cook had a positive culture for Sonne dysentery. Specimens on the students were negative.
Gastroenteritis	December	Everett	16	Corned beef	Unknown	Sixteen persons out of 110 who ate a meal at a factory cafeteria became ill. Bacteriological examination of the corned beef was negative.

TABLE I — *Outbreaks — 1944* — Concluded

Disease	Month	Location	Cases	Suspected Vehicle	Etiological Agent	Remarks
Gastroenteritis	December	Norfolk	"Many"	Mackerel	Staphylococcus aureus	Following a noon meal "dozens of cases" reported sick at the State Prison Colony dispensary. Bacteriological examination of the fish showed staphylococcus aureus.
Jaundice infection	November	Danvers State Hospital	6	Unknown	Unknown	Six cases occurred in a women's ward.
Salmonella infections	March	Newton	6	Unknown	Salmonella typhi murium	Cases occurred in one household. The housewife had positive cultures with no symptoms. She was a general cook, not baker, at a cafeteria in a local manufacturing concern. A small outbreak of gastroenteritis occurred among these employees a month previous, attributed to mince pie.
Salmonella infections and gastroenteritis	April	Newton	7	Turkey	Salmonella typhi murium	Three members of a family and a dinner guest became ill after a roast turkey dinner. These four people had positive cultures for Salmonella typhi murium. Three guests who dropped in the same evening had gastroenteritis symptoms after eating turkey sandwiches. One of these persons had positive cultures for Salmonella.
Salmonella infections	August	Camp Edwards	60	Lemon pie	Salmonella typhi murium	Officers' mess had lemon pie for supper. Pie filling had stood 24 hours without refrigeration.
Salmonella infections	September	Wellesley	34	Unknown	Salmonella newport	Outbreak at a College among students, help and a teacher.
Scarlet fever	January	Arlington	9	Unknown	Streptococcus Type 5 (Griffith's classification)	Cases in one schoolroom over period of weeks; none in other rooms.

TABLE I — *Outbreaks — 1945*

Disease	Month	Location	Cases	Suspected Vehicle	Diagnosis Confirmed by Laboratory Work	Remarks
Dysentery	January	Wakefield	7	—	Sonne	Cases in state wards in a single foster home.
Dysentery	August	Foxboro State Hospital	11	—	Flexner	In addition about 100 clinical cases.
Diarrhea (new born)	June	Worcester	25	Unknown	—	Hospital outbreaks — 3 deaths.
Diarrhea (new born)	October	Winthrop	6	Unknown	—	Hospital outbreak. Nursery technique not individualized.
Diarrhea (new born)	October–November	Taunton	9	Unknown	—	Hospital outbreak — 6 deaths.
Gastroenteritis	January	Boston	30	—	No	30 out of 80 persons became ill after eating a turkey dinner.
Gastroenteritis	January	Boston	6	—	No	Family outbreak after restaurant meal.
Gastroenteritis	February	Everett	75	Pot roast	No	75 out of 145 ill after noon meal at an industrial plant.
Gastroenteritis	March	Boston	5	Birthday cake	Staphylococcus aureus	Five persons ate the cake; all ill.
Gastroenteritis	April	Braintree	11	Turkey and dressing	Green producing streptococci present.	Outbreak at rest home.
Gastroenteritis	May	Cambridge	80+	Turkey and lobster	No	Outbreak following a banquet.
Gastroenteritis	June	Lawrence	5	Custard filled eclairs	No	All five ate eclairs.
Gastroenteritis	September	Waltham	9	Cream pie	Staphylococcus aureus	All ate pie purchased from a bakery.
Gastroenteritis	October	Andover	137	Unknown	No	Two outbreaks among students at private school at different times.
Gastroenteritis	October	Northampton	Several	Oysters	No	Cases occurred after a luncheon among a group of professional men.
Gastroenteritis	November	Quincy	69	Pot roast	Possibly hemolytic streptococci	Outbreak at local college. Food-handler had positive throat cultures for hemolytic streptococci.

TABLE I — *Outbreaks — 1945* — Concluded

Disease	Month	Location	Cases	Suspected Vehicle	Diagnosis Confirmed by Laboratory Work	Remarks
Influenza	December	Needham	About 500	—	Yes	Among school children and towns people.
Mumps	March	W. Springfield	About 25	—	—	Unusual prevalence at a "workers' camp" of native Jamaicans. Mumps complicated by orchitis.
Paralysis	July	Newton	5	Unknown	—	Five cases of peculiar paralysis in one family.
Salmonella infections	July	Quincy	38	Apple snow and baked beans	—	Outbreak at local college.
Scarlet fever	January	Ipswich	12	—	—	12 out of 29 pupils in one grade became ill.
Sore throat and gastroenteritis	July	Boxford	22	Unknown	Yes	Cases occurred at a summer boys camp.
Undefined illness	August	Amesbury	24	—	—	Outbreak at summer camp.

TABLE I. — *Outbreaks — 1946*

Disease	Month	Location	Cases	Suspected Vehicle	Diagnosis Confirmed by Laboratory Work	Remarks
Diarrhea of the newborn	January	Revere	5	—	—	Outbreak in newborn nursery, one death.
Diarrhea of the newborn	June	Framingham	9	—	—	Outbreak in newborn nursery.
Diarrhea of the newborn	June	Worcester	5	—	—	Outbreak in newborn nursery. Of ten babies exposed, five developed the syndrome and two died.
Diarrhea of the newborn	July	Malden	8	—	—	Outbreak in newborn nursery.
Diarrhea of the newborn	October	Worcester	20 (?)	—	—	Outbreak in newborn nursery, ten deaths.
Diarrhea of the newborn	December	Cambridge	28	—	—	Outbreak in newborn nursery and pediatric ward.
Diarrhea of the newborn	December	Medford	7	—	—	Outbreak in newborn nursery; no deaths, no further spread.
Diarrhea	February	Sherborn (Reformatory)	12	—	—	Cases occurred among children in institution.
Diphtheria	July	Gloucester	5	—	Yes	Family outbreak.
Gastroenteritis	February	Brookline	10	Unknown	—	Ten known cases occurred following the serving of "hors d'oeurves" at an "open house." Laboratory analysis of a meat-stuffed bun showed neither staphylococci nor salmonella organisms.
Gastroenteritis	February	Worcester	5	Unknown	—	Five persons became ill following lunch served at a diner. Ham sandwiches, Boston cream pie and coffee were on the menus.
Gastroenteritis	April	Belmont	Several	Mince and pressed ham	Staphylococcus aureus which did not produce coagulase and did not ferment lactose. Negative for salmonella.	Several members of a family became violently ill a few hours after eating meat.

TABLE I — *Outbreaks — 1946* — Concluded

Disease	Month	Location	Cases	Suspected Vehicle	Diagnosis Confirmed by Laboratory Work	Remarks
Gastroenteritis	May	Westport	5	Cottage cheese	Staphylococcal aureus which ferments lactose and mannite and produces coagulase found.	Family outbreak following the consumption of cheese made at home from raw milk.
Gastroenteritis	June	Worcester	About 100	Chicken salad	Staphylococcus aureus	Outbreak occurred following a wedding reception.
Gastroenteritis	June	Arlington, Melrose	5	Unknown	No	Five people became ill after eating chicken croquettes in a Shrewsbury restaurant. No food available for analysis.
Gastroenteritis	July	Ashland	About 60	Unknown	No	Cases at a "Workmen's Shelter Camp."
Gastroenteritis	July	Westboro	10	—	—	Cases among guests at a "night club."
Gastroenteritis	August	Palmer	50	Turkey	—	Outbreak followed a wedding party.
Gastroenteritis	September	Cambridge	11	Chocolate cream pie	Staphylococcus aureus	All the people ill had eaten eclairs or chocolate cream pie.
Gastroenteritis	September	Salem, Marblehead	5	Potato salad	Streptococci of the viridans group present in potato salad.	Persons in two families ill after eating salad.
Gastroenteritis	October	Lawrence	5	Boston cream pie	Staphylococcus aureus.	Five persons became ill after ateing cream pie purchased at a local bakery.
Gastroenteritis	October	Douglas	About 40	Milk (?)	No	Staphylococcus aureus from milk handlers and from raw milk not identical.
Gastroenteritis	October	Southbridge	Several	Chicken and celery sandwich spread	Green producing streptococci found	Several people ill immediately after eating sandwiches containing spread.
Gastroenteritis	November	Richmond	About 40	Not known	—	Outbreak of gastroenteritis among school children and their parents.
Gastroenteritis	December	Waltham	Unknown	Not known, probably contact	—	Outbreak in an institution, numerous cases.

Gastroenteritis	December	Boston	Unknown	Not known, probably contact	—	Outbreak in an institution, numerous cases.
Gastroenteritis	December	Worcester	About 50	Not known	—	Cases occurred among patients and nurses in a hospital. No connection with infectious diarrhea outbreak.
Poliomyelitis	July	Washington	5	—	—	Five cases in Scout Camp, October Mountain.
Poliomyelitis	November	Ashburnham	8 (?)	—	—	Eight cases in same locality.
Salmonellosis	March	Brockton	6	—	Salmonella typhi murium	Family outbreak.
Salmonellosis	June	Brookline, Newton Boston	Several hundred	Chopped liver	Salmonella newport	An outbreak of gastroenteritis occurred among residents of Brookline, Boston and Newton when infected liver was distributed by a single caterer to several parties in this region. One of the food handlers employed by the caterer had been out of work with an illness compatible with salmonella infection, and returned to work one week after the onset of her illness. She had been intimately connected with the preparation of the chopped liver and her stool cultures were positive for Salmonella newport, the organism recovered from patients in the outbreak.
Salmonellosis	July	Boxford	54	—	Salmonella newport	Outbreak at boys camp.
Strep. sore throat	July	Foxboro	—	—	Yes	Outbreak at girls' camp.
Strep. sore throat	July	Halifax	50–60	—	Yes	Outbreak at boys' camp.

TABLE I — *Outbreaks — 1947*

Disease	Month	Location	Cases	Suspected Vehicle	Diagnosis Confirmed by Laboratory Work	Remarks
Diarrhea of the newborn	Jan.–March	Revere	About 15	—	—	Cases at Revere Gen. Hosp. 3 deaths.
Diarrhea of the newborn	April	Boston	30	—	—	Cases at Mass. Mem. Hosp. 14 deaths.
Diarrhea of the newborn	May	Cambridge	5	—	—	Cases at Charlesgate Hospital.
Diarrhea of the newborn	May	Brockton	5	—	—	Cases at Brockton Hospital.
Diarrhea of the newborn	May	Boston	6	—	—	Cases at Glynn Hospital, Dorchester.
Diarrhea of the newborn	July	Boston	5	—	—	Cases in nursery of Saint Mary's Lying in Hospital and Asylum, Dorchester. 1 death.
Diarrhea	January	Newton	13	—	—	Apparently not infant diarrhea of newborn Newton-Wellesley Hospital.
Diarrhea	May	Worcester	14	—	—	14 infants and children in the nursery and wards of the Memorial Hospital developed a mild diarrhea.
Diarrhea	July	Tewksbury	6	—	—	Cases in the Children's section of the Tewksbury State Hospital. 1 death.
Diarrhea	November	Brookline	5	—	—	Mild cases among infants at Allerton Hospital, apparently not diahrrea of newborn.
Gastroenteritis	January	Boston	6	—	—	Cases occurred among patients and one employee at the Psycopathic Hospital.
Gastroenteritis	January	Boston	About 100	—	—	Cases occurred after a banquet held at a local hotel. The Department was not notified at the time of the outbreak.
Gastroenteritis	January	Cambridge	5	Turkey	Staphylococcus aureus which ferments lactose.	Family outbreak.

Gastroenteritis	January	Danvers	About 440	—	—	Cases among patients and employees in State Hospital.
Gastroenteritis	January	Norwell	8	Ice cream	—	Children became ill after eating coffee-flavored ice cream at a drug store.
Gastroenteritis	January	Maynard	Several	—	—	Cases occurred after a banquet where turkey and dressing were served.
Gastroenteritis	January	Worcester	40	—	—	Cases among staff, personnel and their families as well as patients at the State Hospital.
Gastroenteritis	February	Cambridge	Not stated	Lamb patties	—	About one-half students living in two dormitories became ill after the noon meal.
Gastroenteritis	February	Medfield	258	—	—	Patients and employees ill at State Hospital.
Gastroenteritis	February	Newburyport	116	Ham	Staphylococcus aureus	Outbreak among high school students.
Gastroenteritis	February	Norfolk	175	—	—	Cases occurred at prison colony following a particular meal.
Gastroenteritis	February	Westborough	450	—	—	Out of 1700 patients, 450 became ill at State Hospital.
Gastroenteritis	Feb.–March	Wrentham	110	—	—	Cases at State School.
Gastroenteritis	March	Grafton	22	—	—	Cases at State Hospital.
Gastroenteritis	April	Lawrence	20	—	—	The office force of a local mill all became ill at the same time.
Gastroenteritis	April	Norwell	30+	—	—	Cases occurred after a church supper. Similiar episode occurred at same club about a month previous. Number of cases not known.
Gastroenteritis	May	Boston	40	(1) soup (2) meat loaf	—	Two episodes of illness at a "frat" house.
Gastroenteritis	May	Easthampton	85	Turkey and dressing	Hem. strep.	Illness followed a wedding party.
Gastroenteritis	May	Northboro	30	—	—	Following a wedding dinner guests became ill.

TABLE I — *Outbreaks — 1947* — Continued

Disease	Month	Location	Cases	Suspected Vehicle	Diagnosis Confirmed by Laboratory Work	Remarks
Gastroenteritis	May	Wayland	100	Chicken	—	Guests who had attended a wedding reception became ill.
Gastroenteritis	May	Wellesley (College)	35	Turkey salad	Strep. of the viridans group found.	Students ill following an evening meal.
Gastroenteritis	June	Boston	Several	Strawberry custard	—	Illness occurred among guests who had attended a wedding dinner.
Gastroenteritis	June	Boston	40	—	—	Following a wedding reception guests became ill. A turkey dinner had been served.
Gastroenteritis	June	Brookline	30	Fish balls, peas, and macaroni	Staph. aureus that ferments lactose, etc.	Following a "confirmation" party guests became ill.
Gastroenteritis	June	Foxboro	234	—	—	Over a period of two weeks cases occurred among patients at State Hospital.
Gastroenteritis	June	Taunton	30	—	—	Cases at State Hospital.
Gastroenteritis	July	Boston	About 230	Butterscotch pudding	—	Cases among patients, employees, and nurses at State Hospital.
Gastroenteritis	July	Marblehead	75	Chicken broth and chicken salad	Hemolytic coagulase positive staphylococcus aureus which ferments lactose and mannite.	Following a church supper people became ill. Positive nose and throat cultures were obtained on some of the food handlers.
Gastroenteritis	August	Malden	50	Chicken salad	Staphylococcus aureus	Cases occurred after a bridal shower.
Gastroenteritis	August	Plymouth	9	Turkey	Staphylococcus aureus	Cases occurred after a picnic. The turkey had not been refrigerated.
Gastroenteritis	August	Wrentham	22	—	—	Cases occurred among young children at the State School.
Gastroenteritis	September	Boston and vicinity	20	—	—	Cases occurred following a wedding reception in a Boston hotel.
Gastroenteritis	September	Canton	740+	Water	Bacteria of the coliform group.	Outbreak followed a temporary pollution of the water supply.

Gastroenteritis	September	Newton	26	Cold, boiled lobster	—	Cases occurred after a Westboro picnic where the salad was served.
Gastroenteritis	September	U. S. Coast Guard Base and three ships at Boston Wharf.	About 50	—	—	These cases occurred over a period of a week.
Gastroenteritis	October	Southboro	200+	Not known	Water samples unsuitable for examination.	About 80% of the students at St. Mark's School as well as the faculty, employees, and townspeople were affected.
Gastroenteritis	October	Templeton	9	Cream puffs, cream-filled doughnuts	Staphylococcus aureus which ferments lactose, etc.	Bakery was found to be in a grossly insanitary condition.
Gastroenteritis	November	Billerica	50	Chop suey	No food available for examination.	Following a church supper, persons who had eaten the chop suey became ill.
Gastroenteritis	November	Chicopee	200+	Turkey, gravy and dressing	Hemolytic staphylococcus aureus.	Outbreak followed wedding receptions at the Frontenac Club and Mt. View Club. Served by the same caterer.
Gastroenteritis	November	Fall River	19	Not known	—	Fourteen cases at the Tuberculosis and five at the General Hospital.
Gastroenteritis	November	Lancaster	Numerous cases	Not known	—	Cases reported from different sections of the town.
Gastroenteritis	December	Leominster	10	Not known	All food samples examined in laboratory were negative. Throat cultures and stool cultures on persons connected with both outbreaks were negative.	Family outbreak. Turkey roasted by the same Fitchburg caterer who served the above party.
Gastroenteritis	December	Springfield	About 25	Chocolate candies (Victory buttons)	Candies examined by the laboratory showed a nonhemolytic staphylococcus aureus which ferments lactose but not mannite and produces coagulase.	Cases occurred among pupils attending the Holy Family School.

TABLE I — *Outbreaks — 1947* — Concluded

Disease	Month	Location	Cases	Suspected Vehicle	Diagnosis Confirmed by Laboratory Work	Remarks
Gastroenteritis	December	Worcester	About 50	Turkey dressing	A hemolytic staphylococcus aureus which ferments lactose and mannite and produces coagulase, and streptococcus viridans present in dressing.	Outbreak occurred following a dinner party given by a local insurance company. The food was prepared and served by a Fitchburg catering company.
Salmonellosis	August	Monterey	6	Food	S. montevideo	Six of nine members of two households were ill after a joint meal.
Salmonellosis	December	Canton	About 75	—	S. oranienburg	Outbreak at Hospital School.
Typhoid Fever	October	Clinton	6	Food	Yes	Family outbreak. A member of household was found to be a carrier. She had been cooking for the family.
Upper Respiratory Infection	August	Becket	64	Not known	—	Outbreak occurred among Y.M.C.A. campers. Influenza suspected but laboratory examinations on bloods from patients were negative.

TABLE I — *Outbreaks — 1948*

Disease	Month	Location	Cases	Suspected Vehicle	Diagnosis Confirmed by Laboratory Work	Remarks
Diarrhea of the newborn	March	Waltham	6	—	—	Cases at Waltham Hospital among babies born at the hospital.
Diarrhea of the newborn	April–May	Tewksbury	7 (4 deaths)	—	—	Cases among infants at Tewksbury State Hospital.
Diarrhea of the newborn	July	Haverhill	4	—	—	Cases at Hale Hospital among infants born at the hospital.
Diphtheria	June	Foxboro	8	—	Yes	Cases at Foxboro State Hospital. Diphtheria organisms found among patients and employees.
Gastroenteritis	January	Boston	98	Ground beef or lemon pudding	Streptococcus viridans present in sample of lemon pudding; swab from meat grinder and serving can.	Outbreak among patients on two wards.
Gastroenteritis	February	Wellesley	50+	Soup or machine-sliced roast beef	No	Students ill after eating evening meal. No food available for examination.
Gastroenteritis	February	Boston	9	Candy	No	Two families became ill after eating valentine candies. Staphylococci or salmonella were not found in the culture from the chocolate candy.
Gastroenteritis	March	Hingham	9	Spring water	—	State engineer advised local board of health that water from the spring was unsafe for drinking or culinary purposes.
Gastroenteritis	April	Barnstable	17	Sausage meat or skim milk	No. (staphylococcus aureus of a typical reaction)	Outbreak at House of Correction
Gastroenteritis	April	Worcester	5	Veal and gravy	Yes. (staphylococcus aureus)	Family outbreak.
Gastroenteritis	May	Springfield	Probably 50+	Food served at wedding party	No	Outbreak followed a wedding reception held at a local restaurant, where a full course dinner was served. 53 guests attended — most of whom became ill.

TABLE I — *Outbreaks — 1948* — Concluded

Disease	Month	Location	Cases	Suspected Vehicle	Diagnosis Confirmed by Laboratory Work	Remarks
Gastroenteritis	June	Grafton	90–100	Probably turkey dressing	—	Following a wedding breakfast at which turkey, dressing, cream potatoes, etc. were served, people became ill.
Gastroenteritis	June	Holden	About 50	Meat and gravy	Yes. Meat and gravy examined at Worcester Health Dept. Laboratory. Identified organisms as staphylococcus aureus were found.	Outbreak occurred after a church supper held in a Worcester restaurant and attended by Holden residents
Gastroenteritis	June	Swampscott	Several episodes. No. of cases not known	—	See remarks	Several outbreaks occurred following conventions held at local hotel. Nose and throat cultures from two food handlers were positive for staphylococcus aureus.
Gastroenteritis	July	Boston	119+	"Food"	—	Cases among employees of an insurance company, who had eaten at the company cafeteria. Menu included lemon jelly filled cake and egg salad.
Gastroenteritis	July	Fall River	Unknown	—	—	Cases occurred among people who had eaten at a local club.
Gastroenteritis	July-August	Boston	160	—	—	Two outbreaks at State Prison, 3 weeks apart.
Gastroenteritis	October	Bridgewater	75	"Pork"	Bacteriological examination of pork showed aerobic spore bearing bacilli, colon bacilli and staphylococcus albus	Following two separate meals at which pork was served inmates became ill.
Gastroenteritis	August	Boston	50+	—	—	Outbreak of enteritis of non-bacterial origin, probably a staphylococcus toxin.
Gastroenteritis	November	Bedford	21	—	—	Cases occurred among elderly people living at a "Lodge."
Reported as meningitis and lymphocytic choriomeningitis	September	Fitchburg and Leominster	40–100			

Poliomyelitis	August	West Boylston	34	—	On spinal fluids	Cases among students at Worcester Training School. Cases occurred also in the town of Boylston and surrounding towns.
Salmonellosis infections.	August	Norfolk	7	—	S. Newport	Cases occurred among inmates at Norfolk Prison Colony.
Scarlet Fever	July	Sharon	10	—	—	Cases occurred at a Salvation Army Vacation camp.

TABLE I — *Outbreaks — 1949*

Disease	Month	Location	Cases	Suspected Vehicle	Diagnosis Confirmed by Laboratory Work	Remarks
Diphtheria	May	Boston	8	—	Diphtheria bacilli	Cases in female infirmary at a State Hospital.
Dysentery bacillary	September	Boston	5	—	Sonne	Outbreak at a nursery for blind babies, with a population of 17 babies.
Dysentery bacillary Sonne	October	Cambridge	8	—	Sonne	Outbreak among college students.
Gastroenteritis	March	Framingham	100	Not known	—	Students at a teacher's college became ill on two successive days. Difficult to incriminate any particular food. Chef who made dressing for salad, etc. had been ill with a gastroenteritis upset a few days before.
Gastroenteritis	April	Quincy	50	Cream filled custard confections containing frozen eggs.	—	Persons became ill after eating various confections sold by a local bakery.
Gastroenteritis	May	Wrentham	12	—	—	Cases at State School. Two cases had positive cultures for Flexner dysentery.
Gastroenteritis	May	Boston	48	—	—	Cases at State Hospital among nurses, patients, and employees, following a noon meal.
Gastroenteritis	June	Chicopee	?	?	—	Several family groups involved. Eight people ate the same batch of clams and became ill.
Gastroenteritis	June	Worcester	50	Cold roast turkey	—	Outbreak followed a wedding. Turkey had been cooked on Friday. Bacteriological examination of throat cultures from two food handlers showed staphylococcus albus present. No food available for examination.
Gastroenteritis	July	Sturbridge	125	—	—	Outbreak at a summer camp.

Gastroenteritis	July	Gloucester	49	Turkey and gravy	—	Outbreak confined to help at a local hotel. No food available for examination.
Gastroenteritis	August	Worcester	6	Ham and corn	—	Family outbreak.
Gastroenteritis	August	Gloucester	7	—	—	Cases occurred among the kitchen help of a hotel.
Gastroenteritis	September	Brookline	50	—	—	Cases occurred at a local high school among students who had eaten at the school cafeteria.
Gastroenteritis	October	Milton	25	Potato salad	Staphylococcus enterotoxin	Cases occurred at a seminary following an evening meal. Salad not refrigerated.
Gastroenteritis	October	Leominster	5	Frankfurters	—	Five members of a family became violently ill one-half hour after a meal.
Gastroenteritis	October	Danvers	15	Turkey pie	—	Following a noon meal at a local factory restaurant, people became ill. Food not properly refrigerated.
Gastroenteritis	October	Chelmsford, Tyngsboro, Westford	132	Milk	Staphylococcus enterotoxin	Source of infection probably a cow with an infected udder from a Chelmsford farm. Suspected milk was improperly pasteurized. The outbreak occurred among school children.
Gastroenteritis	October	Lowell	6	"Ready to eat" ham	—	Ham sandwiches served at a local luncheonette. Food not refrigerated.
Gastroenteritis	December	Westfield	150+	Turkey, stuffing and mashed potato	Streptococcus of the viridans group, staphylococcus albus, beta hemolytic streptococcus were present in the food.	Following a Christmas party attended by members of a local industry, practically all who attended became ill. The cook had an episode of illness a short time before.
Gastroenteritis	December	Cambridge	7	Cream puffs (?)	—	Family outbreak.
Salmonellosis infections	June	Brookline	71 known cases	Turkey and gravy	S. typhimurium	Outbreak followed a turkey dinner served to participants in a Memorial Day parade. This was a catered meal and was not properly refrigerated.

TABLE II — *Diphtheria*

YEAR	Cases	Case Rate per 100,000	Deaths	Death Rate per 100,000	Fatality Rate (Per Cent)
1940	144	3.3	8	.2	5.6
1941	123	2.8	12	.3	9.8
1942	154	3.6	7	.2	4.5
1943	140	3.2	11	.3	7.8
1944	229	5.3	10	.2	4.4
1945	194	4.3	10	.2	5.2
1946	439	9.6	36	.8	8.2
1947	433	9.4	12	.3	2.8
1948	290	6.3	27	.6	9.3
1949	333	7.1	44	.9	13.2

TABLE III — *Measles*

1940	21,698	502.6	11	.3	.05
1941	22,338	516.5	4	.1	.02
1942	25,590	590.7	16	.4	.06
1943	35,098	809.0	21	.5	.05
1944	19,837	456.5	20	.5	.10
1945	7,486	166.0	10	.2	.13
1946	38,400	844.1	14	.3	.03
1947	12,065	263.1	12	.3	.09
1948	37,081	802.0	18	.4	.04
1949	26,394	566.3	12	.3	.05

TABLE IV — *Meningitis, Meningococcal*

1940	47	1.1	15	.3	31.9
1941	98	2.3	25	.6	25.5
1942	191	4.4	34	.8	17.8
1943	736	16.9	119	2.7	16.2
1944	456	10.5	81	1.9	17.8
1945	161	3.6	20	.4	12.4
1946	116	2.5	21	.5	21.6
1947	47	1.0	15	.3	31.9
1948	66	1.4	20	.4	30.3
1949	50	1.1	9	.2	18.0

TABLE V — *Poliomyelitis*

1940	45	1.0	2	.04	4.4
1941	182	4.2	6	.1	3.3
1942	36	.8	3	.06	8.3
1943	252	5.8	18	.4	7.1
1944	436	10.0	17	.4	3.9
1945	527	11.7	22	.5	4.2
1946	378	8.3	19	.4	5.0
1947	345	7.5	12	.3	3.5
1948	175	3.8	5	.1	2.8
1949	1,782	38.2	51	1.1	2.9

TABLE VI — *Scarlet Fever*

1940	5,277	122.2	19	.4	.4
1941	7,141	165.1	13	.3	.2
1942	11,526	266.1	10	.2	.1
1943	15,400	354.9	19	.4	.1
1944	11,956	275.2	14	.3	.1

TABLE VI — *Scarlet Fever — Continued*

YEAR	Cases	Case Rate per 100,000	Deaths	Death Rate per 100,000	Fatality Rate (Per Cent)
1945	10,373	229.9	7	.2	.1
1946	6,079	133.6	2	.04	.03
1947	4,424	96.5	4	.1	.1
1948	6,033	130.5	1	.02	.01
1949	6,052	129.8	1	.02	.01

TABLE VII — *Tuberculosis ,Pulmonary*

1940	2,816	65.2	1,484	34.4	52.7
1941	2,987	69.1	1,521	35.2	50.9
1942	3,075	71.0	1,501	34.7	48.8
1943	2,739	63.1	1,697	39.1	61.9
1944	2,679	61.6	1,612	37.1	60.2
1945	2,675	59.3	1,557	34.5	58.2
1946	2,858	62.8	1,592	35.0	55.7
1947	2,608	56.9	1,495	32.6	57.3
1948	2,656	57.4	1,279	27.7	48.2
1949	2,451	52.6	1,064	22.8	43.4

TABLE VIII — *Tuberculosis, Other Forms*

1940	294	6.8	114	2.6	38.8
1941	295	6.8	112	2.6	38.0
1942	199	4.6	118	2.7	59.3
1943	221	5.1	109	2.5	49.3
1944	193	4.4	84	1.9	43.5
1945	164	3.6	79	1.8	48.2
1946	179	3.9	82	1.8	45.8
1947	187	4.1	89	1.9	47.6
1948	166	3.6	82	1.8	49.4
1949	139	3.0	59	1.3	42.8

TABLE IX — *Typhoid Fever*

1940	86	2.0	8	.18	9.3
1941	68	1.6	3	.07	4.4
1942	50	1.2	1	.02	2.0
1943	34	.8	5	.11	14.7
1944	32	.7	1	.02	3.1
1945	18	.4	2	.04	11.1
1946	33	.7	2	.04	6.1
1947	23	.5	2	.04	8.6
1948	33	.7	2	.04	6.1
1949	30	.6	3	.06	10.0

TABLE X — *Whooping Cough*

1940	7,959	184.4	22	.5	.3
1941	9,790	226.4	40	.9	.4
1942	10,932	252.4	27	.6	.2
1943	5,990	138.1	38	.9	.6
1944	4,051	93.2	15	.3	.4
1945	7,445	165.0	22	.5	.3
1946	6,514	143.2	16	.4	.2
1947	7,121	155.3	15	.3	.2
1948	2,778	60.1	11	.2	.4
1949	4,638	99.5	7	.2	.2

TABLE XI — *Cases and Deaths for all Reportable Diseases by Months—1942*

	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER		TOTAL	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Actinomycosis	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	1	1
Anthrax	–	–	–	–	3	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	5	1
Chicken Pox	2274	1	1651	–	1793	–	2053	–	1763	1	1267	–	436	–	121	1	105	–	291	–	969	1	1444	–	14167	4
Diphtheria	14	1	11	–	16	–	13	2	16	–	14	1	21	1	12	–	9	1	11	–	5	1	12	–	154	7
Dog Bite	579	–	474	–	841	–	1073	–	1335	–	1414	–	1227	–	1031	–	846	–	812	–	564	–	505	–	10701	–
Dysentery, Amebic	1	–	–	–	2	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	1
Dysentery, Bacillary	6	–	3	–	–	–	9	–	5	1	2	–	–	–	4	–	6	–	314	–	30	–	6	–	385	1
Encephalitis, Infectious	2	1	–	1	4	–	–	2	4	–	6	2	–	2	2	–	3	2	3	–	1	2	–	1	25	13
German Measles	130	–	261	–	1182	–	1983	–	2443	–	1327	–	212	–	83	–	68	–	57	–	61	–	190	–	7997	–
Gonorrhea	357	2	326	–	323	–	311	–	321	1	355	–	413	1	479	–	521	–	384	1	378	–	286	–	4454	5
Lymphocytic Choriomen.	1	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	3	–
Malaria	1	1	1	–	–	–	–	–	–	–	1	–	1	–	6	1	6	1	–	–	2	–	–	–	18	3
Measles	1018	1	1753	–	3245	4	5512	3	5320	3	3652	2	1159	1	296	–	150	–	541	–	1073	2	1871	–	25590	16
Meningitis, Meningococcal	13	2	12	4	23	3	23	4	17	5	16	1	13	–	18	3	6	2	11	3	12	1	27	6	191	34
Meningitis, Pfeiffer Bacil.	2	1	3	3	4	2	4	–	4	–	3	1	3	–	1	1	1	–	–	1	1	1	3	2	29	12
Meningitis, Pneumococcal	2	1	9	6	12	5	2	4	4	4	4	2	2	1	–	–	1	1	1	–	4	2	5	1	46	27
Meningitis, Other Forms	4	1	1	2	7	–	2	1	3	–	4	2	2	1	–	–	1	1	2	–	1	2	2	1	29	11
Meningitis, Undetermined	–	–	1	–	4	–	2	–	1	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	10	–
Mumps	2229	–	1930	–	2791	–	2411	2	2017	–	1326	–	555	–	271	–	248	–	401	–	639	–	1080	–	15898	2
Ophthalmia Neonatorum	55	–	52	–	81	–	74	–	72	–	63	–	54	–	53	–	44	–	41	–	48	–	38	–	675	–
Pneumonia, Lobar	390	88	477	78	516	118	338	72	200	50	154	35	100	30	121	21	192	38	242	63	233	62	327	94	3290	749
Poliomyelitis	2	–	2	–	–	–	1	–	2	–	–	–	9	–	2	–	9	–	5	2	2	1	2	–	36	3
Salmonellosis	7	1	4	–	–	–	5	–	3	–	8	–	9	–	13	–	33	–	13	1	7	–	7	–	109	2
Scarlet Fever	1394	1	1399	1	1457	2	1686	2	1120	1	791	–	330	–	224	1	315	2	621	–	882	–	1307	–	11526	10
Septic Sore Throat	16	1	19	1	32	2	17	1	16	3	15	1	11	–	4	–	6	2	11	3	14	4	10	–	171	18
Syphilis	417	20	374	15	443	34	553	27	523	21	512	20	427	18	354	14	460	14	610	23	535	24	489	18	5697	248
Tetanus	2	1	–	–	1	1	–	–	3	–	–	–	1	–	1	–	2	1	–	–	–	–	1	1	11	4
Trachoma	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	1	–	–	–	2	–	2	–	9	–
Trichinosis	3	–	–	–	3	–	2	–	3	–	2	–	1	–	–	–	–	–	1	–	–	–	4	–	19	–
Tuberculosis, Pulmonary	199	107	223	122	262	127	232	168	321	129	312	128	314	107	265	118	252	130	236	132	220	114	239	119	3075	1501
Tuberculosis, Other Forms	18	12	14	12	13	10	14	6	23	13	23	14	22	10	19	12	12	6	11	–	17	14	13	9	199	118
Tuber., Childhood Type	5	–	7	–	11	–	9	–	24	–	17	–	9	–	20	–	11	–	5	–	8	–	13	–	139	–
Typhoid Fever	8	–	6	–	2	1	1	–	2	–	4	–	4	–	9	–	3	–	7	–	–	–	4	–	50	1
Typhus Fever	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	2	–
UndulantFever	–	–	5	–	2	–	4	–	1	–	3	–	4	–	4	–	4	–	6	–	–	–	2	–	35	–
Weil's Disease	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–
Whooping Cough	1111	1	779	4	1004	3	931	2	970	2	950	3	882	4	673	4	778	2	731	1	952	1	1171	–	10932	27

TABLE XI — *Cases and Deaths for all Reportable Diseases by Months—1943*

	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER		TOTAL	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Actinomycosis	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	2	2
Anthrax	–	–	–	–	–	–	1	–	1	–	–	–	–	–	1	–	–	–	1	–	–	–	1	–	5	–
Chicken Pox	1362	–	1279	1	1604	1	1136	–	1125	–	1011	1	400	1	123	–	114	–	485	–	1281	1	1618	2	11538	7
Diphtheria	5	–	8	–	9	2	8	1	4	1	7	–	6	1	5	1	10	–	17	1	29	2	32	2	140	11
Dog Bite	447	–	511	–	703	–	945	–	1136	–	1465	–	1115	–	1064	–	882	–	703	–	592	–	431	–	9994	–
Dysentery, Amebic	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–
Dysentery, Bacillary	3	–	6	–	4	–	2	–	12	–	1	–	2	1	14	–	23	–	24	–	22	3	105	–	218	4
Encephalitis, Infectious	3	1	2	–	3	–	4	–	3	–	4	3	3	2	1	–	3	–	1	–	2	–	5	2	34	9
German Measles	1165	1	3491	–	8210	–	8658	1	8077	1	3682	–	468	–	72	–	59	–	82	–	66	–	118	–	34148	3
Gonorrhea	289	1	345	–	327	–	379	1	360	–	420	–	355	–	374	–	430	1	435	–	510	–	477	–	4701	3
Leprosy	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Lymphocytic Choriomen.	–	–	1	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	4	–
Malaria	–	–	–	–	2	–	–	–	12	–	12	–	12	–	13	–	13	–	16	–	25	–	11	–	116	–
Meningitis, Meningococcal	40	9	48	9	118	14	118	19	74	15	74	7	51	11	34	5	42	5	40	7	37	6	60	12	736	119
Meningitis, Pfeiffer Bacil.	6	2	–	–	3	3	1	1	2	1	2	–	3	2	1	1	1	1	8	3	6	1	3	5	36	20
Meningitis, Pneumococcal	8	3	2	5	2	2	5	3	11	8	4	4	5	3	2	1	4	3	4	2	4	6	7	11	58	51
Mening., Other Forms**	2	2	1	–	6	2	7	1	2	3	2	–	–	–	1	–	2	–	–	–	–	2	5	1	28	11
Meningitis, Undetermined	7	3	4	6	12	5	16	5	23	4	8	5	9	3	11	2	11	2	13	3	11	3	5	5	130	46
Measles	1886	1	2661	3	6416	2	7282	8	6993	3	5320	2	1468	–	346	–	189	–	401	1	816	–	1320	1	35098	21
Mumps	1113	–	1113	1	1077	–	770	–	645	–	611	–	244	–	137	–	150	–	158	–	399	–	670	–	7087	1
Ophthalmia Neonatorum*	56	–	49	–	39	–	74	–	39	–	74	–	44	–	34	–	49	–	56	–	34	–	45	–	593	–
Pneumonia, Lobar	342	115	323	93	372	113	306	148	232	71	230	53	93	26	76	25	114	31	161	42	225	62	576	188	3104	967
Poliomyelitis	6	1	–	–	2	–	3	–	1	–	2	–	1	–	24	5	121	7	54	3	24	2	14	–	252	18
Salmonellosis	4	–	3	–	2	1	42	–	6	–	4	–	19	–	22	1	30	–	14	–	7	–	5	–	158	2
Scarlet Fever	1470	3	2080	2	2494	3	2579	5	1947	2	1442	–	439	–	248	2	397	–	622	–	704	1	978	1	15400	19
Septic Sore Throat	15	2	12	2	29	1	24	3	10	1	9	1	7	1	6	–	7	–	10	–	12	3	19	1	160	15
Syphilis	397	20	363	27	479	24	455	33	507	22	499	30	363	18	418	24	482	21	380	34	617	23	560	25	5520	301
Tetanus	–	–	–	–	–	–	1	1	1	–	1	–	1	1	2	2	5	4	1	–	–	–	2	–	14	8
Trachoma	1	–	1	–	2	–	2	–	2	–	–	–	1	–	–	–	1	–	1	–	1	–	1	–	13	–
Trichinosis	2	–	1	–	3	–	–	–	–	–	1	–	3	–	–	–	2	–	–	–	1	–	–	–	13	–
Tuberculosis, Pulmonary	186	161	165	122	283	147	253	154	279	136	308	153	191	156	252	133	188	126	225	123	215	121	194	165	2739	1697
Tuberculosis, Other Forms	16	8	14	7	18	6	17	14	17	8	25	11	17	13	23	6	26	5	12	10	18	10	18	11	221	109
Tuber., Childhood Type	11	–	–	–	–	–	1	–	2	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	15	–
Tularemia	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	1	–	–	–	–	–	3	–
Typhoid Fever	–	–	2	–	–	1	3	–	1	–	8	1	6	1	3	–	2	1	4	–	3	1	2	–	34	5
Typhus Fever	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	3	–
Undulant Fever	–	–	1	–	1	–	3	–	3	–	6	–	7	–	5	–	2	1	6	–	6	–	3	–	43	1
Weil's Disease	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	2	–
Whooping Cough	881	1	658	3	874	8	604	4	537	4	465	2	317	1	286	3	301	1	321	4	405	1	341	6	5990	38

*Meningitis other forms includes cases of known etiological agents: B. coli, staphyloccal, streptococcal.
**Ophthalmia Neonatorum includes cases of suppurative conjunctivitis for every year except 1949.

TABLE XI — *Cases and Deaths for all Reportable Diseases by Months—1944*

	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER		TOTAL	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Actinomycosis	–	–	2	1	1	–	–	–	–	–	1	1	1	–	–	1	–	–	–	–	–	–	–	–	5	3
Anthrax	–	–	2	1	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–	4	1
Chancroid	–	–	3	–	2	–	1	–	3	–	4	–	1	–	2	–	1	–	1	–	2	–	5	–	25	–
Chicken Pox	2512	–	2754	1	3360	–	2791	1	2560	1	1748	1	638	1	192	–	132	–	370	–	1025	–	1407	–	19489	5
Diphtheria	24	–	26	1	25	–	18	–	21	–	6	2	14	1	5	–	14	1	19	–	28	1	29	4	229	10
Dog Bite	460	–	575	–	733	–	908	–	1388	–	1186	–	1041	–	1025	–	824	–	842	–	590	–	517	–	10098	–
Dysentery, Amebic	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
Dysentery, Bacillary	23	–	12	1	19	–	–	–	34	–	2	–	23	–	18	1	40	1	32	1	24	1	12	1	239	6
Encephalitis, Infectious	2	3	2	1	2	–	1	–	3	1	3	1	–	–	1	–	3	1	1	–	3	–	2	1	23	8
German Measles	147	–	188	–	316	–	398	–	381	–	199	–	60	–	57	–	30	–	35	–	55	–	72	–	1938	–
Gonorrhea	387	–	390	–	509	–	319	–	440	–	442	–	356	–	426	–	410	–	438	–	445	–	373	–	4935	–
Gran. Inguinale	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–	5	–	7	–
Hookworm	–	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	2	–
Lymphocytic Choriomen.	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Lymphogranuloma Vener.	–	–	1	–	5	–	7	–	4	–	4	–	3	–	–	–	3	–	1	–	2	–	2	–	32	–
Malaria	24	1	46	1	55	1	53	1	68	–	59	1	66	–	47	–	26	1	36	1	50	–	42	–	572	7
Measles	1647	1	1877	–	3546	–	3491	6	4208	3	3011	3	876	4	227	1	92	–	274	–	353	2	235	–	19837	20
Meningitis, Meningococcal	90	15	55	9	59	11	40	5	42	9	28	8	27	4	30	3	11	4	20	5	28	5	26	3	456	81
Meningitis, Pfeiffer Bacil.	5	3	2	2	4	3	5	3	2	1	–	3	1	1	3	1	–	–	4	1	5	3	7	1	38	22
Meningitis, Pneumococcal	18	11	9	13	8	1	9	10	6	3	3	–	2	–	2	1	1	1	2	1	2	2	9	2	71	45
Meningitis, Other Forms	2	–	1	1	1	1	3	–	3	2	1	–	3	1	1	–	–	–	–	–	4	–	1	1	20	6
Meningitis, Undetermined	17	2	15	2	20	4	13	2	16	3	7	1	5	3	4	3	4	–	2	2	4	2	1	–	108	24
Mumps	913	1	1091	–	1575	–	1483	–	1459	–	966	–	434	–	273	–	224	–	350	–	914	–	1352	–	11034	1
Ophthalmia Neonatorum	53	–	57	–	75	–	41	–	73	–	67	–	40	–	38	–	41	–	30	–	38	–	30	–	583	–
Pneumonia, Lobar	647	155	356	77	424	89	350	84	291	69	215	32	85	23	72	32	66	28	159	54	162	51	232	70	3059	764
Poliomyelitis	1	–	–	–	–	–	1	1	1	–	1	–	23	–	133	5	131	5	99	4	35	1	11	1	436	17
Rocky Mt. Spotted Fever	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	2	–
Salmonellosis	1	–	1	–	12	1	5	–	16	–	13	–	11	–	24	–	13	–	15	–	4	–	5	–	120	1
Scarlet Fever	1200	3	1769	–	1906	–	1724	3	1500	2	898	–	241	1	197	–	241	1	456	2	776	1	1048	1	11956	14
Septic Sore Throat	21	–	23	2	34	–	20	–	22	2	13	1	5	–	1	–	6	–	8	1	14	–	21	2	188	8
Syphilis	447	33	456	22	674	17	334	19	439	19	458	23	303	12	393	16	363	16	408	19	420	17	373	20	5068	233
Tetanus	1	–	1	–	2	2	1	–	–	–	2	–	1	2	–	–	2	1	4	1	3	2	1	–	18	8
Trachoma	1	–	2	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	1	–	–	–	2	–	8	–
Trichinosis	1	–	2	–	6	–	4	–	1	–	2	–	2	–	1	–	1	–	6	–	1	–	4	–	31	–
Tuberculosis, Pulmonary	237	143	266	136	228	163	179	135	220	157	287	145	213	138	232	115	199	121	230	126	217	116	171	123	2679	1612
Tuberculosis, Other Forms	17	11	24	9	21	6	18	6	13	6	21	7	17	6	13	8	11	8	16	5	11	6	11	6	193	84
Tuber., Childhood Type	2	–	–	–	2	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	6	–
Tularemia	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Typhoid Fever	2	1	2	–	2	–	4	–	2	–	2	–	2	–	5	–	3	–	1	–	1	–	6	–	32	1
Typhus Fever	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	1	–	3	–
Undulant Fever	6	–	1	–	3	–	3	–	7	–	5	–	3	–	7	1	2	–	2	–	4	–	3	–	46	1
Weil's Disease	–	–	–	–	–	–	–	–	–	–	–	–	1	1	1	1	–	–	–	–	–	–	–	–	2	2
Whooping Cough	373	2	340	1	376	2	313	1	324	1	248	1	283	–	261	1	285	1	286	–	498	2	464	3	4051	15

TABLE XI — *Cases and Deaths for all Reportable Diseases by Months—1945*

	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER		TOTAL	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Actinomycosis	–	1	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	1	1	–	–	–	–	2	3
Anthrax	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	1	4	1
Chancroid	3	–	1	–	4	–	2	–	1	–	1	–	2	–	1	–	1	–	1	–	1	–	2	–	20	–
Chicken Pox	1798	–	1340	–	1320	–	963	–	1122	2	1282	–	363	–	121	–	90	–	331	–	771	–	900	–	10401	2
Diphtheria	18	–	14	–	20	3	25	–	14	–	15	3	13	–	11	–	11	1	15	–	17	1	21	2	194	10
Dog Bite	579	–	487	–	769	–	1286	–	1289	–	1266	–	1229	–	974	–	924	–	742	–	631	–	409	–	10585	–
Dysentery, Amebic	–	–	–	–	1	–	–	–	–	–	3	–	2	–	5	–	–	–	2	–	1	–	4	–	18	–
Dysentery, Bacillary	43	2	9	1	4	–	–	–	19	–	1	–	44	–	54	1	11	1	39	2	9	1	12	–	245	8
Encephalitis, Infectious	4	–	1	1	7	1	–	2	1	–	–	2	–	–	–	1	1	1	3	–	1	2	–	–	18	10
German Measles	156	–	116	–	224	–	195	–	167	–	139	–	62	–	38	–	49	–	46	–	55	–	61	–	1308	–
Gonorrhea	366	–	303	–	459	–	463	–	484	–	378	–	537	–	459	–	405	–	657	–	509	–	467	–	5487	–
Granuloma Inguinale	–	–	–	–	1	–	–	–	2	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	4	–
Hookworm	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–	2	–	3	–	–	–	–	–	8	–
Lymphocytic Choriomen.	–	–	1	–	–	–	4	–	1	–	–	–	–	–	1	–	3	–	–	–	1	–	1	–	8	–
Lymphogranuloma Vener.	10	–	3	–	2	–	4	–	3	–	1	–	4	–	1	–	–	–	2	–	1	–	–	–	31	–
Malaria	68	1	53	–	76	1	124	–	146	–	92	–	136	–	68	–	102	–	39	–	44	–	83	–	1031	2
Measles	260	–	305	2	624	–	732	2	996	2	1409	1	735	–	274	–	145	–	647	2	657	1	702	–	7486	10
Meningitis, Meningococcal	18	–	22	5	21	1	16	1	16	4	15	2	15	2	5	2	3	2	11	–	7	1	12	–	161	20
Meningitis, Pfeiffer Bacil.	6	3	3	1	3	–	2	–	1	2	2	2	2	1	2	–	–	2	4	1	5	–	2	3	32	15
Meningitis, Pneumococcal	5	2	2	2	2	2	7	4	7	2	6	1	3	4	1	1	1	1	–	1	5	4	3	–	42	24
Meming., Other Forms**	2	1	–	1	–	1	3	–	3	–	4	1	2	1	5	–	1	–	2	–	1	1	2	1	25	7
Meningitis, Undetermined	5	6	6	3	4	3	5	2	3	1	4	2	1	7	2	1	2	4	3	4	3	2	3	1	41	36
Mumps	2010	–	1888	–	2789	–	2431	–	2222	1	1677	–	686	–	312	–	194	–	326	–	523	–	669	–	15727	1
Ophthalmia Neonatorum*	54	–	54	–	51	–	55	–	29	–	46	–	41	–	22	–	28	–	46	–	36	–	33	–	495	–
Pneumonia, Lobar	300	79	241	67	257	77	322	60	261	51	140	38	112	35	93	33	57	28	97	35	92	45	165	74	2137	622
Poliomyelitis	2	–	3	–	4	–	2	–	1	–	2	–	33	3	127	4	162	4	134	6	46	3	11	2	527	22
Rocky Mt. Spotted Fever	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–	1	1
Salmonellosis	3	–	4	–	8	–	6	–	3	–	18	–	8	–	48	–	9	1	5	1	7	–	5	–	124	2
Scarlet Fever	1618	–	1201	3	1692	1	1422	1	1521	1	948	–	263	–	157	–	190	–	372	–	466	–	523	1	10373	7
Septic Sore Throat	31	1	17	2	20	1	19	–	10	2	20	2	17	–	17	–	15	3	16	2	5	–	13	2	200	15
Syphilis	358	16	351	17	412	23	342	8	388	20	335	12	321	14	293	16	292	16	436	20	391	11	459	16	4378	189
Tetanus	1	–	–	–	–	1	2	–	–	–	–	–	3	1	2	–	2	2	–	–	2	–	–	–	12	4
Trachoma	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–
Trichinosis	7	–	2	–	7	–	3	–	3	–	–	–	–	–	3	–	–	–	–	–	2	–	1	–	28	–
Tuberculosis, Pulmonary	213	130	192	118	230	148	206	143	306	145	192	141	275	122	215	127	205	133	236	114	241	115	164	121	2675	1557
Tuberculosis, Other Forms	12	10	14	4	20	7	7	12	18	12	13	7	11	5	12	4	14	7	24	4	9	5	10	2	164	79
Tuber., Childhood Type	–	–	1	–	2	–	1	–	–	–	2	–	–	–	1	–	–	–	3	–	3	–	1	–	14	–
Typhoid Fever	–	–	2	–	1	–	2	–	–	–	2	1	–	–	4	–	–	–	2	–	3	1	2	–	18	2
Undulant Fever	2	–	1	–	5	–	2	–	2	–	6	–	3	1	5	1	2	–	7	–	4	–	10	1	49	3
Weil's Disease	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	3	1
Whooping Cough	612	–	595	–	853	2	568	1	670	4	560	–	587	4	531	1	570	3	640	4	661	1	598	2	7445	22

**Meningitis, other forms includes cases of known etiological agents: B. coli, staphyloccal, streptococcal.
*Ophthalmia Neonatorum includes cases of stppurative conjunctivitis for every year except 1949.

TABLE XI — *Cases and Deaths for all Reportable Diseases by Months—1946*

	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER		TOTAL	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Actinomycosis	–	–	–	–	3	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	3	2
Anthrax	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–	1	–	2	1
Chancroid	3	–	1	–	1	–	2	–	4	–	1	–	2	–	–	–	1	–	2	–	2	–	–	–	19	–
Chicken Pox	1023	2	765	–	1391	–	1751	1	2248	–	1400	–	516	–	123	–	110	–	478	–	770	–	1337	–	11912	3
Diphtheria	10	1	21	–	19	–	15	3	21	3	21	2	31	1	20	–	50	10	83	2	61	8	87	6	439	36
Dog Bite	487	–	487	–	988	–	1216	–	1421	–	1318	–	1333	–	1019	–	1079	–	991	–	664	–	556	–	11559	–
Dysentery, Amebic	2	1	3	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	–	–	1	–	–	–	7	2
Dysentery, Bacillary	4	1	9	–	14	–	10	1	5	–	2	–	5	–	1	–	5	–	6	–	3	–	4	–	68	2
Encephalitis, Infectious	2	–	–	2	1	1	1	–	–	1	1	1	1	–	–	1	–	1	–	1	2	–	–	–	8	8
German Measles	73	–	216	–	680	1	1191	–	1469	–	572	–	133	–	46	–	56	–	52	–	63	–	67	–	4618	1
Gonorrhea	663	–	494	–	424	–	453	–	340	–	326	–	447	–	365	–	443	–	413	1	378	–	316	–	5062	1
Gran. Inguinale	–	–	–	–	1	–	–	–	–	–	1	–	1	–	–	–	–	–	1	–	–	–	–	–	4	–
Hookworm	–	–	1	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–
Lymphocytic Choriomen.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	2	–	4	–
Lymphogranuloma Vener.	1	–	1	–	2	–	1	–	–	–	2	–	2	–	–	–	1	–	–	–	–	–	–	–	10	–
Malaria	52	–	102	–	63	–	35	–	39	–	58	1	39	–	21	–	25	–	23	–	15	–	7	–	509	1
Measles	1018	1	1142	1	3081	1	8612	3	11494	4	7876	3	2534	–	400	1	204	–	508	–	691	–	840	–	38400	14
Meningitis, Meningococcal	24	2	19	5	12	2	14	–	7	1	4	1	4	–	4	1	8	4	5	2	6	1	9	2	116	21
Meningitis, Pfeiffer Bacil.	3	–	2	2	4	2	3	2	2	1	2	2	2	2	2	2	2	–	3	–	5	–	8	2	38	15
Meningitis, Pneumococcal	7	5	4	3	5	6	7	1	4	3	2	1	6	1	–	1	3	2	2	–	1	–	7	3	48	26
Meningitis, Other Forms**	4	–	–	1	1	1	–	–	2	2	1	–	–	–	–	–	1	–	–	–	1	1	–	–	10	5
Meningitis, Undetermined	4	3	5	2	2	3	4	3	3	3	6	3	8	–	4	2	1	1	4	4	1	–	2	1	44	25
Mumps	698	–	639	–	831	–	924	–	922	–	538	–	216	–	142	–	101	–	175	–	306	–	318	–	5810	–
Ophthalmia Neonatorum*	27	–	22	–	49	–	77	–	39	–	37	–	59	–	14	–	40	–	39	–	48	–	34	–	485	–
Pneumonia, Lobar	325	107	223	80	243	87	128	51	117	40	63	35	70	27	29	17	37	29	73	34	61	33	114	52	1483	592
Poliomyelitis	–	–	1	–	2	–	2	–	1	–	–	1	11	4	62	2	100	5	128	4	54	3	17	–	378	19
Rocky Mt. Spotted Fever	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–
Salmonellosis	5	–	8	–	8	1	3	–	3	–	38	–	16	–	45	–	20	–	10	–	14	–	10	–	180	1
Scarlet Fever	804	–	706	–	892	–	824	–	851	–	423	–	179	–	110	–	138	1	196	–	292	–	664	1	6079	2
Septic Sore Throat	10	1	14	1	14	–	15	1	13	1	5	1	8	–	12	–	5	–	22	1	23	2	38	1	179	9
Syphilis	617	16	526	20	482	12	454	20	439	16	373	19	486	15	310	18	352	11	390	11	303	12	238	13	4970	183
Tetanus	–	–	1	–	–	–	1	–	2	–	3	–	1	1	1	–	1	1	3	1	–	–	–	–	13	3
Trachoma	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
Trichinosis	3	–	4	–	4	–	5	–	2	–	2	–	3	–	3	–	1	–	4	–	4	–	3	–	38	–
Tuberculosis, Pulmonary	248	167	205	135	248	138	225	142	342	140	186	142	256	137	233	107	237	133	247	128	224	103	207	120	2858	1592
Tuberculosis, Other Forms	5	9	11	8	23	9	12	6	23	11	11	8	13	8	18	6	19	2	19	3	12	5	13	7	179	82
Tuber., Childhood Type	1	–	1	–	1	–	1	–	2	–	–	–	–	–	1	–	–	–	–	–	–	–	3	–	10	–
Tularemia	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	2	–
Typhoid Fever	–	1	–	–	3	–	2	–	2	–	3	–	7	–	5	1	3	–	3	–	2	–	3	–	33	2
Typhus Fever	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	1	–	–	–	–	–	3	–
Undulant Fever	1	–	–	1	5	–	9	–	6	–	3	–	11	–	6	–	1	1	3	1	5	–	2	–	52	3
Whooping Cough	480	5	410	3	592	1	476	1	573	1	521	1	562	–	498	1	520	1	554	1	598	–	730	2	6514	16

**Meningitis other forms includes cases of known etiological agents: mumps, staphyloccal, streptococcal.
*Ophthalmia Neonatorum includes cases of suppurative conjunctivitis for every year except 1949.

TABLE XI — *Cases and Deaths for all Reportable Diseases by Months—1947*

	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER		TOTAL	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Actinomycosis	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Anthrax	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	2	–
Chancroid	1	–	2	–	3	–	3	–	–	–	1	–	2	–	2	–	2	–	4	–	5	–	6	–	31	–
Chicken Pox	2391	1	2542	–	3063	–	2667	–	2599	2	1823	2	664	–	179	–	123	–	309	–	753	1	1680	–	18793	6
Diphtheria	69	1	57	1	72	2	40	1	37	1	37	1	19	1	17	2	10	–	21	–	18	1	36	1	433	12
Dog Bite	508	–	564	–	790	–	1053	–	1232	–	1432	–	1316	–	1021	–	942	1	888	–	620	–	616	–	10982	1
Dysentery, Amebic	1	–	1	–	3	–	2	–	1	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–	10	–
Dysentery, Bacillary	10	–	13	2	9	2	7	1	5	1	11	–	11	–	9	1	13	6	60	3	21	–	19	1	188	17
Encephalitis, Infectious	–	1	2	–	2	1	–	–	1	–	–	–	1	–	–	–	2	–	–	–	–	–	–	–	8	2
German Measles	108	–	101	–	112	–	102	–	107	–	90	–	52	–	41	–	43	–	52	–	60	–	64	–	932	–
Gonorrhea	360	–	346	–	295	–	332	–	273	–	316	–	352	–	308	–	393	–	334	–	234	–	262	–	3805	–
Granuloma Inguinale	1	–	1	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–	5	–
Hookworm	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	2	–
Lymphocytic Choriomen.	–	–	2	–	1	–	–	–	–	–	1	–	1	–	1	–	–	–	–	–	–	–	–	–	6	–
Lymphogranuloma Vener.	1	–	2	–	–	–	2	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	2	–	8	–
Malaria	8	1	8	–	8	–	4	–	10	1	8	1	15	–	7	1	7	–	4	–	5	–	7	–	91	4
Measles	1876	3	2021	1	1795	1	1756	2	1783	3	1292	2	616	–	125	–	69	–	120	–	153	–	459	–	12065	12
Meningitis, Meningococcal	6	2	7	5	2	1	6	2	3	1	1	–	7	–	–	–	3	–	6	–	4	2	2	2	47	15
Meningitis, Pfeiffer Bac.	3	2	5	–	4	2	7	4	10	2	5	2	1	–	1	–	–	–	2	2	3	–	8	1	49	15
Meningitis, Pneumococcal	3	–	6	3	2	1	2	1	2	4	4	3	2	2	–	1	1	2	2	3	3	1	3	3	30	24
Mening., Other Forms**	–	–	2	–	2	–	–	–	–	–	–	–	3	1	1	2	1	1	–	–	1	–	–	1	10	5
Meningitis, Undetermined	6	4	6	6	8	4	2	1	4	2	1	2	3	3	2	2	12	2	2	–	7	–	4	–	57	26
Mumps	666	–	668	–	1174	1	1131	–	1095	–	888	–	347	–	170	–	148	–	374	–	461	–	1267	–	8389	1
Ophthalmia Neonatorum*	48	–	44	–	41	–	51	–	57	–	48	–	58	–	68	–	25	–	58	–	56	–	47	–	601	–
Pneumonia, Lobar	142	69	128	45	172	66	203	69	173	34	99	21	107	26	77	26	31	24	68	28	48	31	96	61	1344	500
Poliomyelitis	5	1	–	2	2	–	–	–	–	–	2	1	21	1	80	1	147	2	65	3	15	1	8	–	345	12
Rocky Mt. Spotted Fever	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	3	–
Salmonellosis	10	–	5	–	15	–	16	–	14	1	7	–	13	–	19	–	26	–	14	–	8	1	9	–	156	2
Scarlet Fever	651	2	627	–	564	–	486	1	440	1	282	–	120	–	72	–	130	–	273	–	304	–	475	–	4424	4
Septic Sore Throat	18	2	17	–	14	1	18	–	10	2	7	–	4	–	–	1	6	–	5	1	9	–	5	–	113	7
Syphilis	311	22	271	15	364	13	303	19	279	17	243	21	216	11	187	13	206	11	322	11	235	11	274	14	3211	178
Tetanus	–	–	1	–	1	–	–	–	–	–	2	1	4	–	–	–	2	–	–	–	–	–	–	–	10	1
Trachoma	–	–	2	–	2	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	1	–	7	–
Trichinosis	3	–	4	–	9	–	6	–	2	–	2	–	5	1	5	–	4	–	7	–	7	–	5	–	59	1
Tuberculosis, Pulmonary	255	137	189	116	167	145	261	155	248	150	240	136	218	132	171	123	217	89	228	110	204	107	210	95	2608	1495
Tuberculosis, Other Forms	15	6	13	4	14	11	17	8	22	8	25	7	12	7	10	9	16	10	19	6	10	4	14	9	187	89
Tuber., Childhood Type	1	–	–	–	1	–	–	–	–	–	2	–	–	–	–	–	1	–	–	–	–	–	3	–	8	–
Tularemia	–	–	1	–	–	–	–	–	–	2	–	–	2	–	2	–	–	–	2	–	–	–	–	–	7	2
Typhoid Fever	3	1	–	–	1	–	3	–	1	–	–	–	1	1	2	–	1	–	6	–	1	–	4	–	23	2
Undulant Fever	3	–	4	–	7	–	5	–	8	–	16	–	6	–	7	–	10	–	3	–	3	–	4	–	76	–
Whooping Cough	895	2	620	2	645	1	499	–	495	1	508	–	551	3	475	1	644	1	460	–	647	1	682	3	7121	15

**Meningitis, other forms includes cases of known etiological agents: mumps, staphyloccal, streptococcal.
*Ophthalmia Neonatorum includes cases of suppurative conjunctivitis for every year except 1949.

TABLE XI — *Cases and Deaths for all Reportable Diseases by Months—1948*

	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER		TOTAL	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Actinomycosis	–	–	–	–	–	1	–	–	–	–	–	–	1	1	–	–	1	–	–	–	–	–	–	–	2	2
Anthrax	2	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	3	1
Chancroid	2	–	4	–	4	–	–	–	2	–	–	–	4	–	4	–	2	–	2	–	5	–	3	–	32	–
Chicken Pox	2322	–	1838	–	2405	–	1973	–	1612	–	1665	1	619	–	163	–	135	–	622	–	1740	–	3024	–	18118	1
Diphtheria	15	4	19	2	21	1	18	2	14	2	33	1	14	1	17	–	27	1	28	5	37	1	47	7	290	27
Dog Bite	569	–	600	–	864	–	1107	–	1237	–	1537	–	1497	–	1184	–	980	–	739	–	789	–	654	–	11757	–
Dysentery, Amebic	1	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	1	1	–	–	1	–	5	1
Dysentery, Bacillary	14	1	11	2	9	1	12	2	8	3	28	5	9	1	11	3	9	–	5	–	3	–	2	–	121	18
Encephalitis, Infectious	2	–	1	–	5	–	2	–	4	1	6	–	3	–	–	2	2	–	1	–	5	–	3	1	34	4
German Measles	70	–	79	–	119	–	130	–	132	–	191	–	61	–	47	–	58	–	47	–	59	–	83	–	1076	–
Gonorrhea	196	–	186	–	215	–	254	–	218	–	310	–	284	–	334	–	303	–	284	–	262	–	257	–	3103	–
Gran. Inguinale	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–
Lymphocytic Choriomen.	1	–	–	–	–	–	–	–	1	–	2	–	1	–	5	–	9	–	2	–	1	–	1	–	23	–
Lymphogranuloma Vener.	1	–	2	–	1	–	1	–	2	–	1	–	–	–	2	–	1	–	1	–	1	–	1	–	14	–
Malaria	1	–	3	–	7	–	3	–	1	–	–	–	4	–	1	–	1	–	1	–	1	–	–	2	23	2
Measles	1167	2	2093	2	4205	2	5950	3	5743	1	6540	3	2461	3	595	2	203	–	660	–	2790	–	4674	–	37081	18
Meningitis, Meningococcal	8	3	9	1	6	1	3	–	5	1	4	1	5	2	7	4	4	3	6	1	2	1	7	2	66	20
Meningitis, Pfeiffer Bacil.	3	1	2	1	4	2	2	2	5	3	7	–	6	–	1	–	2	–	3	2	4	–	5	1	44	12
Meningitis, Pneumococcal	4	4	2	1	2	2	2	1	2	–	–	1	3	–	–	–	1	–	2	1	5	3	7	4	30	17
Meningitis, Other Forms**	–	–	–	–	1	–	–	–	2	1	2	–	2	1	1	1	1	–	–	–	–	–	2	–	11	3
Meningitis, Undetermined	5	1	5	3	5	2	2	1	3	1	7	1	3	3	6	1	6	–	7	2	3	2	6	1	58	18
Mumps	1517	–	1559	–	2522	–	2614	–	2403	–	2031	–	787	1	428	–	351	–	485	–	1021	–	1319	1	17037	2
Ophthalmia Neonatorum	52	–	40	–	37	–	53	–	36	–	35	–	35	–	24	–	39	–	42	–	49	–	34	–	476	–
Pneumonia, Lobar	131	76	133	60	145	76	114	56	70	39	60	28	124	17	76	14	276	24	60	31	62	27	140	46	1391	494
Poliomyelitis	–	–	2	–	–	–	–	–	–	–	3	–	9	1	68	4	55	–	31	–	5	–	2	–	175	5
Salmonellosis	4	–	4	–	4	–	16	1	6	–	8	–	2	–	12	–	2	–	7	1	3	–	4	–	72	2
Scarlet Fever	415	1	429	–	703	–	812	–	908	–	912	–	269	–	74	–	105	–	243	–	465	–	698	–	6033	1
Septic Sore Throat	8	1	9	–	5	–	12	–	9	1	7	1	1	–	2	1	4	–	12	2	8	–	8	–	85	6
Syphilis	212	14	198	10	226	13	256	14	182	16	203	15	225	13	166	20	141	9	141	12	183	11	180	14	2313	161
Tetanus	1	–	–	–	–	–	–	–	1	–	2	1	–	–	2	–	–	–	2	1	–	–	1	–	9	2
Trachoma	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–	1	–	–	–	4	–
Trichinosis	7	–	–	–	8	–	5	–	–	–	2	–	3	–	7	1	3	–	2	–	4	–	1	–	42	1
Tuberculosis, Pulmonary	198	106	200	111	227	106	242	108	207	130	237	103	251	115	275	112	200	83	171	90	232	105	216	110	2656	1279
Tuberculosis, Other Forms	8	7	10	7	25	6	6	17	11	9	15	7	19	5	14	5	14	7	11	2	18	3	15	7	166	82
Tuber., Childhood Type	–	–	1	–	1	–	3	–	–	–	–	–	–	–	1	–	2	–	1	–	5	–	–	–	14	–
Tularemia	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–
Typhoid Fever	2	–	1	–	1	–	3	–	5	–	5	–	4	–	6	2	1	–	2	–	1	–	2	–	33	2
Undulant Fever	2	–	5	–	4	–	3	–	4	–	5	1	5	–	2	1	4	–	2	–	2	–	1	–	39	2
Whooping Cough	454	3	294	3	241	1	183	2	132	–	102	–	130	–	209	–	268	2	180	–	254	–	331	–	2778	11

**Meningitis other forms includes cases of known etiological agents: B. coli, mumps, staphyloccal, streptococcal.

TABLE XI — *Cases and Deaths for all Reportable Diseases by Months—1949*

	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER		TOTAL	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Actinomycosis	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–
Anthrax	–	–	1	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–
Chancroid	10	–	8	–	7	–	5	–	4	–	4	–	3	–	1	–	2	–	–	–	4	–	–	–	48	–
Chicken Pox	4154	1	3776	1	4026	–	2485	1	2228	–	1978	–	490	–	221	–	85	–	307	–	927	2	1455	–	22132	5
Diphtheria	35	3	32	6	39	7	42	6	41	5	39	4	23	2	25	5	7	–	12	3	20	1	18	2	333	44
Dog Bite	611	–	665	–	946	–	1258	–	1443	–	1594	–	1221	–	1238	–	985	–	866	–	734	–	648	–	12209	–
Dysentery, Amebic	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	3	–
Dysentery, Bacillary	1	–	–	–	4	–	2	–	4	–	1	2	1	1	2	1	4	–	15	1	8	–	13	–	55	5
Encephalitis, Infectious	3	2	1	–	4	3	4	–	3	–	–	–	1	–	–	–	2	–	2	1	4	–	2	–	26	6
German Measles	142	–	207	–	891	–	1011	–	1243	–	665	–	121	–	117	–	48	–	39	–	33	–	38	–	4555	–
Gonorrhea	266	–	203	–	274	–	249	–	254	–	254	–	257	–	258	–	292	–	221	–	206	–	186	–	2920	–
Granuloma Inguinale	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–
Hepatitis, Infectious	–	2	21	1	8	1	8	–	4	1	3	1	3	2	5	2	–	1	3	–	1	1	–	1	56	13
Lymphocytic Choriomen.	2	–	–	–	1	–	3	–	–	–	–	–	–	–	1	–	1	–	1	–	–	–	–	–	9	–
Lymphogranuloma Vener.	3	–	–	–	3	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	8	–
Malaria	–	–	–	–	–	–	1	–	2	–	1	–	1	–	1	–	1	–	1	–	1	–	1	1	10	1
Measles	6024	2	5285	2	6551	3	3921	–	2327	4	1332	1	394	–	151	–	48	–	107	–	141	–	113	–	26394	12
Meningitis, Meningococcal	5	–	4	1	7	2	2	1	3	3	6	1	5	–	5	1	1	–	4	–	3	–	5	–	50	9
Meningitis, Pfeiffer Baccil.	4	1	5	–	–	2	7	–	3	1	7	2	2	1	–	–	1	1	1	–	5	2	8	2	43	12
Meningitis, Pneumococcal	3	2	2	1	3	2	2	1	–	2	5	–	–	–	1	–	–	–	–	–	3	–	4	–	23	8
Mening., Other Forms**	1	2	1	1	3	1	2	–	2	–	1	–	1	–	1	–	1	–	1	1	1	–	–	–	15	5
Meningitis, Undetermined	5	1	1	1	3	1	4	1	2	2	3	3	–	2	5	3	1	–	7	2	8	1	4	2	43	19
Mumps	1633	–	1301	–	1790	–	1346	–	1057	–	1004	–	442	–	275	–	173	–	209	–	385	–	567	–	10182	–
Ophthalmia Neonatorum	17	–	9	–	18	–	18	–	8	–	10	–	16	–	13	–	22	–	11	–	8	–	12	–	162	–
Poliomyelitis	–	–	–	–	–	–	1	–	10	–	29	2	91	4	719	17	601	17	239	5	73	4	19	2	1782	51
Rocky Mt. Spotted Fever	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–
Salmonellosis	3	–	2	–	2	–	1	–	2	–	5	1	5	–	73	–	7	1	24	–	3	–	3	–	130	2
Scarlet Fever	1012	–	1312	–	1212	–	652	1	649	–	385	–	91	–	66	–	56	–	113	–	236	–	268	–	6052	1
Septic Sore Throat	5	–	15	–	20	–	10	1	4	1	8	1	7	–	6	1	5	–	5	2	5	–	6	–	96	6
Syphilis	194	12	168	15	218	12	198	7	216	11	227	8	140	9	153	6	155	6	132	7	133	7	109	5	2043	105
Tetanus	1	–	1	–	–	–	1	–	–	–	2	–	1	–	3	–	–	–	–	–	2	–	–	–	11	–
Trachoma	–	–	3	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–	1	–	6	–
Trichinosis	4	1	1	–	6	–	1	–	–	–	2	–	–	–	–	–	9	–	6	–	–	–	3	–	32	1
Tuberculosis, Pulmonary	194	103	183	89	170	94	279	93	234	95	186	95	243	90	223	99	194	74	134	86	189	91	222	55	2451	1064
Tuberculosis, Other Forms	12	4	10	2	14	7	16	14	22	3	13	6	12	2	7	5	8	5	6	3	7	4	11	4	138	59
Tuber., Childhood Type	–	–	–	–	1	–	2	–	–	–	2	–	1	–	3	–	1	–	1	–	–	–	–	–	11	–
Tularemia	1	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–	4	–
Typhoid Fever	–	–	4	–	–	–	4	1	6	–	2	–	7	2	3	–	–	–	1	–	3	–	–	–	30	3
Typhus Fever	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
Undulant Fever	3	–	2	–	7	–	2	–	4	–	2	–	4	–	2	–	1	–	3	–	1	–	–	–	31	–
Whooping Cough	304	1	249	–	319	1	281	–	389	–	466	1	387	1	479	2	463	–	314	1	539	–	448	–	4638	7

**Meningitis, other forms includes cases of known etiological agents: B. coli, mumps, staphyloccal, streptococcal and torula.

TABLE XII — *Cases of Reportable Diseases by Ages for 1942*

DISEASE	Under 1 Year	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 to 14 years	15 to 19 years	20 to 24 years	25 to 29 years	30 to 39 years	40 to 49 years	50 to 59 years	60 to 69 years	70 years and over	Age Unknown	Total
Actinomycosis	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1
Anthrax	–	–	–	–	–	–	–	–	–	–	–	–	1	1	2	–	–	1	–	–	5
Chicken Pox	424	597	774	906	1064	1604	2441	1912	1155	745	1411	277	104	54	71	20	2	2	3	601	14167
Diphtheria	1	2	3	13	9	15	18	8	9	7	31	11	6	3	11	5	2	–	–	–	154
Dysentery, Amebic	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1	–	–	–	1	3
Dysentery, Bacillary	3	5	5	7	12	17	20	29	19	17	71	52	35	28	20	15	6	4	4	16	385
Encephalitis, Infectious	1	1	1	–	2	3	2	1	–	1	4	2	1	3	1	–	1	1	–	–	25
German Measles	157	229	233	196	221	301	533	519	457	436	1891	1360	722	302	177	35	15	4	–	209	7997
Gonorrhea	6	4	4	6	2	4	2	4	7	4	13	373	1674	1171	805	245	84	23	4	19	4454
Lymphocytic Choriomeningitis	–	–	–	–	1	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	3
Malaria	–	–	–	–	–	–	–	–	1	–	–	–	5	6	3	1	2	–	–	–	18
Measles	491	1205	1454	1747	2117	2944	3975	3190	2088	1527	2627	683	389	228	157	48	7	2	2	709	25590
Meningitis, Meningococcal	13	9	13	9	3	9	2	5	3	4	11	24	31	21	19	4	6	4	1	–	191
Meningitis, Pfeiffer Bacillus	6	9	9	1	1	–	1	1	1	–	–	–	–	–	–	–	–	–	–	–	29
Meningitis, Pneumococcal	8	2	2	–	1	2	1	–	2	–	1	1	1	–	9	5	4	5	1	1	46
Meningitis, Other Forms	10	1	3	–	–	–	–	–	1	–	–	2	1	1	1	2	4	2	1	–	29
Meningitis, Undetermined	1	–	–	–	–	1	–	–	1	–	–	–	1	2	–	2	–	2	–	–	10
Mumps	45	158	309	547	745	1149	2030	1954	1542	1211	3362	1040	409	234	381	143	48	24	10	557	15898
Pneumonia, Lobar	94	75	55	49	51	54	59	37	64	35	169	194	190	185	391	370	400	327	374	117	3290
Poliomyelitis	–	2	2	2	1	2	2	5	3	3	4	2	4	3	1	–	–	–	–	–	36
Salmonellosis	10	4	5	3	1	3	4	3	3	3	4	14	5	4	13	13	6	4	1	6	109
Scarlet Fever	45	192	490	702	900	991	1213	1036	900	811	2494	680	280	162	213	100	28	6	2	281	11526
Septic Sore Throat	–	4	2	5	8	5	2	3	3	1	20	18	18	17	31	10	7	5	2	10	171
Syphilis	1	3	–	1	3	1	7	11	10	8	34	169	631	690	1416	1326	881	387	92	26	5697
Tetanus	–	–	–	2	–	–	–	1	1	3	–	–	–	1	1	–	–	2	–	–	11
Trachoma	–	–	–	–	–	–	–	–	–	–	–	–	1	4	–	–	1	1	–	2	9
Trichinosis	–	–	–	–	1	–	–	–	–	–	2	1	2	1	6	2	1	–	–	3	19
Tuberculosis, Pulmonary	3	9	3	6	1	2	7	5	3	5	34	187	409	339	668	491	383	253	105	162	3075
Tuberculosis, Other Forms	1	5	4	6	5	1	–	2	5	5	15	9	16	12	38	28	15	16	5	11	199
Typhoid Fever	1	–	–	1	–	2	–	1	1	2	8	–	8	5	6	8	4	2	1	–	50
Typhus Fever	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	2
Undulant Fever	–	–	–	–	–	–	–	1	–	–	–	1	4	5	13	7	2	2	–	–	35
Weil's Disease	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
Whooping Cough	779	844	986	1217	1221	1342	1410	1031	610	398	626	59	21	26	41	21	9	–	4	287	10932

TABLE XII — *Cases of Reportable Diseases by Ages for 1943*

DISEASE	Under 1 Year	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 to 14 years	15 to 19 years	20 to 24 years	25 to 29 years	30 to 39 years	40 to 49 years	50 to 59 years	60 to 69 years	70 years and over	Age Unknown	Total
Actinomycosis	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	2
Anthrax	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	3	–	–	–	5
Chicken Pox	314	443	632	656	862	1284	1912	1410	1045	630	1317	290	104	58	58	12	11	4	3	493	11538
Diphtheria	–	–	8	8	10	11	9	8	14	10	21	6	6	1	10	4	3	–	3	8	140
Dysentery, Amebic	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1
Dysentery, Bacillary	5	4	15	9	10	5	9	3	15	2	13	16	16	2	10	10	21	25	23	5	218
Encephalitis, Infectious	–	–	1	2	4	2	4	3	2	2	5	4	2	1	–	2	–	–	–	–	34
German Measles	330	530	446	501	633	1061	2281	2560	2877	2585	9846	5549	2524	799	849	192	49	11	2	523	34148
Gonorrhea	15	–	1	2	4	3	5	3	2	4	12	544	1713	1093	921	241	76	27	3	32	4701
Leprosy	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1
Lymphocytic Choriomeningitis	–	–	–	–	–	–	–	–	1	–	–	–	1	2	–	–	–	–	–	–	4
Malaria	–	–	–	–	–	–	–	–	–	–	–	1	43	53	14	2	1	–	–	2	116
Measles	733	1849	2435	2760	3266	4161	5585	4811	2929	2034	2510	632	345	151	144	55	19	3	–	676	35098
Meningitis, Meningococcal	37	21	26	18	30	16	18	12	13	13	57	107	96	53	82	45	26	17	7	42	736
Meningitis, Pfeiffer Bacillus	11	10	3	3	3	–	–	1	1	1	–	1	–	–	1	–	–	1	–	–	36
Meningitis, Pneumococcal	19	4	–	1	2	2	–	–	–	1	4	–	–	–	2	6	6	3	2	58	
Meningitis, Other Forms	4	4	1	1	–	–	–	–	–	–	1	3	–	–	2	2	3	5	1	1	28
Meningitis, Undetermined	13	6	2	–	1	2	3	6	1	2	19	17	12	11	8	14	6	1	2	4	130
Mumps	28	81	158	224	337	499	811	668	622	449	1393	514	400	196	243	75	28	15	7	339	7087
Pneumonia, Lobar	86	62	41	41	44	51	49	47	29	28	107	135	149	146	325	334	368	309	336	417	3104
Poliomyelitis	1	8	24	21	17	22	22	16	19	4	43	25	10	10	7	1	2	–	–	–	252
Salmonellosis	8	4	4	5	3	2	3	5	3	5	16	8	9	13	16	10	22	8	3	11	158
Scarlet Fever	66	210	608	836	1034	1122	1417	1322	1197	985	3421	1243	538	277	363	141	36	11	4	569	15400
Septic Sore Throat	1	2	5	2	3	5	7	1	4	4	13	20	18	14	22	14	9	4	–	12	160
Syphilis	9	2	7	1	3	3	4	3	3	6	21	229	713	750	1333	1116	789	410	80	38	5520
Tetanus	–	–	–	–	1	1	–	1	1	–	3	–	–	1	1	1	2	–	1	1	14
Trachoma	–	–	–	–	–	–	–	–	–	–	–	–	1	–	3	1	3	2	1	2	13
Trichinosis	–	–	–	–	1	–	–	–	–	1	1	2	1	1	1	1	–	–	–	4	13
Tuberculosis, Pulmonary	2	5	2	2	3	4	2	1	5	4	39	185	314	306	533	491	371	243	66	161	2739
Tuberculosis, Other Forms	6	6	8	2	4	5	1	–	2	3	18	11	22	9	37	26	24	19	8	10	221
Tularemia	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	1	–	–	–	3
Typhoid Fever	–	1	2	1	–	–	1	1	1	3	4	5	3	3	4	3	1	–	1	–	34
Typhus Fever	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	1	–	–	3
Undulant Fever	–	–	–	–	–	–	–	–	–	1	3	1	1	3	4	10	6	5	3	6	43
Weil's Disease	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1	–	–	–	–	2
Whooping Cough	507	436	569	629	607	735	754	542	373	190	315	37	17	13	16	4	3	3	2	238	5990

TABLE XII — *Cases of Reportable Diseases by Ages for 1944*

DISEASE	Under 1 Year	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 to 14 years	15 to 19 years	20 to 24 years	25 to 29 years	30 to 39 years	40 to 49 years	50 to 59 years	60 to 69 years	70 years and over	Age Unknown	Total
Actinomycosis	–	–	–	–	–	–	–	–	–	–	–	–	–	2	2	1	–	–	–	–	5
Anthrax	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4	–	–	–	4
Chicken Pox	507	833	997	1124	1289	2073	3564	2531	1741	1037	2131	420	107	74	85	28	11	8	–	929	19489
Diphtheria	2	6	7	12	17	20	18	17	11	19	38	13	6	4	19	9	4	1	2	4	229
Dysentery, Amebic	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	2
Dysentery, Bacillary	3	2	4	3	8	3	3	14	8	5	22	6	11	6	23	14	24	28	39	13	239
Encephalitis, Infectious	1	1	1	1	2	1	3	1	1	2	1	2	–	–	1	1	1	1	–	2	23
German Measles	115	194	138	81	79	104	127	119	98	83	270	200	114	50	52	13	5	3	1	92	1938
Gonorrhea	12	1	3	7	5	–	4	1	4	2	15	624	1638	1181	1015	285	75	16	5	42	4935
Hookworm	–	–	–	–	–	–	–	–	–	–	1	–	–	1	–	–	–	–	–	–	2
Lymphocytic Choriomeningitis	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1
Malaria	–	–	–	–	1	–	–	–	–	–	2	139	211	102	16	2	1	1	1	97	572
Measles	447	1182	1516	1510	1776	2219	3228	2331	1379	803	1663	495	175	81	105	19	4	2	2	900	19837
Meningitis, Meningococcal	20	15	23	21	11	14	6	7	16	12	49	50	30	22	56	35	29	20	6	14	456
Meningitis, Pfeiffer Bacillus	13	4	7	1	3	2	2	1	1	1	2	–	–	–	–	–	1	–	–	–	38
Meningitis, Pneumococcal	20	4	1	1	–	1	1	3	1	1	3	4	2	1	7	3	7	4	6	1	71
Meningitis, Other Forms	2	2	1	2	–	–	–	1	1	–	1	1	–	1	2	2	2	1	1	–	20
Meningitis, Undetermined	10	3	–	2	2	–	4	4	3	1	12	15	6	4	15	7	12	4	3	1	108
Mumps	44	170	330	467	609	982	1536	1286	1053	721	1922	643	221	164	240	88	33	18	9	498	11034
Pneumonia, Lobar	82	66	48	28	39	28	30	29	26	30	95	114	93	161	360	412	429	433	389	167	3059
Poliomyelitis	–	5	20	13	24	34	31	38	37	26	115	39	11	17	15	1	–	–	–	10	436
Rocky Mountain Spotted Fever	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	1	–	–	–	–	2
Salmonellosis	14	8	9	4	5	4	2	1	–	2	6	6	5	5	10	15	9	7	4	4	120
Scarlet Fever	57	260	545	780	833	1061	1238	1032	898	768	2360	779	284	183	251	105	34	8	2	478	11956
Septic Sore Throat	1	6	2	6	8	4	5	9	7	2	23	15	17	18	21	13	12	3	3	13	188
Syphilis	8	2	–	1	–	1	2	–	8	4	32	242	729	763	1232	820	721	359	109	35	5068
Tetanus	–	–	–	–	1	1	1	2	2	–	4	1	–	–	–	1	1	2	1	1	18
Trachoma	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	1	3	1	1	–	8
Trichinosis	–	–	1	–	–	1	–	–	–	–	3	7	4	2	1	4	4	2	–	2	31
Tuberculosis, Pulmonary	1	7	12	9	6	9	4	6	3	9	32	157	284	295	543	476	407	287	93	39	2679
Tuberculosis, Other Forms	4	6	8	5	2	6	3	3	3	1	11	15	15	25	15	19	18	20	4	10	193
Tularemia	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1
Typhoid Fever	–	–	1	–	1	–	–	–	–	2	2	4	–	–	7	4	6	5	–	–	32
Typhus Fever	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	1	–	–	–	3
Undulant Fever	–	–	–	–	–	1	–	–	–	–	–	1	2	1	15	16	4	3	–	3	46
Weil's Disease	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	2
Whooping Cough	300	300	453	442	430	458	550	409	223	128	165	19	3	9	15	3	2	1	–	141	4051

TABLE XII — *Cases of Reportable Diseases by Ages for 1945*

DISEASE	Under 1 Year	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 to 14 years	15 to 19 years	20 to 24 years	25 to 29 years	30 to 39 years	40 to 49 years	50 to 59 years	60 to 69 years	70 years and over	Age Unknown	Total
Actinomycosis	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	2
Anterior Poliomyelitis	5	21	23	33	21	32	45	45	33	28	120	51	20	14	30	4	2	–	–	–	527
Anthrax	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	2	–	–	4
Chicken pox	305	435	663	713	787	1254	1667	1299	836	531	1056	257	77	43	48	20	7	4	1	398	10401
Diphtheria	1	3	10	13	11	13	9	8	10	6	25	15	19	10	16	12	9	4	–	–	194
Dysentery, Amebic	–	–	–	–	–	–	–	–	–	–	–	1	4	7	4	1	1	–	–	–	18
Dysentery, Bacillary	3	4	1	8	3	4	5	2	6	3	14	12	20	15	24	18	24	33	30	16	245
Encephalitis, Infectious	–	–	–	1	1	3	2	3	–	2	4	–	–	–	1	1	–	–	–	–	18
German Measles	115	140	119	69	43	66	89	82	69	51	161	110	72	34	28	9	5	1	–	45	1308
Gonorrhea	18	2	3	3	5	4	3	3	3	1	8	610	1816	1369	1171	322	72	26	3	45	5487
Hookworm	–	–	–	–	–	–	–	–	–	–	–	1	1	3	3	–	–	–	–	–	8
Lymphocytic Choriomeningitis	1	–	–	–	–	–	–	1	–	1	4	–	1	–	–	–	–	–	–	–	8
Malaria	–	–	–	–	–	–	–	–	–	–	–	8	285	472	233	29	4	–	–	–	1031
Measles	257	491	633	633	773	761	1071	841	460	238	484	212	96	51	48	17	4	4	–	412	7486
Meningitis, Meningococcal	12	4	10	6	5	6	3	5	3	2	19	19	7	13	17	12	7	7	–	4	161
Meningitis, Pfeiffer Bacillus	12	6	3	2	2	4	1	–	1	–	1	–	–	–	–	–	–	–	–	–	32
Meningitis, Pneumococcal	8	4	2	–	–	–	2	–	–	–	2	3	1	2	–	5	5	5	3	–	42
Meningitis, Other Forms	6	2	1	–	2	3	–	2	–	–	3	2	–	–	–	–	–	1	1	2	25
Meningitis, Undetermined	3	3	–	1	1	2	1	2	–	–	4	2	3	2	1	3	9	4	–	–	41
Mumps	59	258	467	674	839	1379	2218	1933	1485	1125	2797	764	298	216	376	158	65	32	17	567	15727
Pneumonia, Lobar	71	44	35	16	31	27	32	23	20	20	65	83	67	79	235	288	360	271	285	85	2137
Rocky Mountain Spotted Fever	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1
Salmonella Inf.	12	3	6	7	5	4	3	3	2	2	8	4	24	7	10	10	7	3	4	–	124
Scarlet Fever	56	238	573	734	804	876	1066	873	731	623	2002	729	198	159	229	101	30	9	6	336	10373
Septic Sore Throat	1	8	8	6	11	4	13	2	9	7	25	20	21	8	27	11	7	2	–	10	200
Syphilis	21	1	2	–	3	3	1	5	4	1	20	185	707	767	1033	644	533	341	75	32	4378
Tetanus	–	–	1	–	–	1	1	–	1	–	2	–	–	–	1	–	2	1	2	–	12
Trachoma	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1
Trichinosis	–	–	–	–	1	–	–	–	–	1	4	5	3	3	7	4	–	–	–	–	28
Tuberculosis, Pulmonary	8	3	11	3	11	8	4	6	3	1	25	142	286	267	452	483	422	308	124	108	2675
Tuberculosis, Other Forms	7	4	10	5	4	1	2	6	1	2	5	9	15	13	16	25	18	10	5	6	164
Typhoid Fever	–	–	–	–	1	1	–	–	2	–	2	2	–	2	4	2	2	–	–	–	18
Undulant Fever	–	–	–	–	–	–	1	–	–	–	1	–	2	3	11	17	5	8	1	–	49
Weil's Disease	–	–	–	–	–	–	–	–	–	–	–	2	–	–	1	–	–	–	–	–	3
Whooping Cough	541	553	742	799	775	830	951	652	468	263	397	51	11	8	41	17	8	4	2	332	7445

TABLE XII — *Cases of Reportable Diseases by Ages for 1946*

DISEASE	Under 1 Year	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 to 14 years	15 to 19 years	20 to 24 years	25 to 29 years	30 to 39 years	40 to 49 years	50 to 59 years	60 to 69 years	70 years and over	Age Unknown	Total
Actinomycosis	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	1	–	3
Anthrax	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	2
Chicken Pox	314	491	673	830	947	1560	2057	1560	972	525	1096	216	89	58	60	16	10	1	2	435	11912
Diphtheria	3	9	26	40	36	38	29	29	33	12	80	30	13	15	21	9	10	6	–	–	439
Dysentery, Amebic	–	–	–	–	–	–	–	–	–	–	–	–	2	2	1	1	1	–	–	–	7
Dysentery, Bacillary	–	1	1	2	2	4	–	2	3	2	12	12	4	2	3	5	1	3	3	6	68
Encephalitis, Infectious	–	–	1	–	–	–	4	–	–	–	1	–	–	–	1	–	–	–	–	1	8
German Measles	134	171	176	171	160	255	368	374	359	301	1146	630	105	63	92	26	5	2	1	79	4618
Gonorrhea	13	–	2	3	6	2	6	–	4	7	23	478	1951	1294	956	216	66	7	2	26	5062
Hookworm	–	–	–	–	–	–	–	–	–	–	–	–	1	2	–	–	–	–	–	–	3
Lymphocytic Choriomeningitis	–	–	–	–	–	–	1	–	–	–	–	–	1	1	1	–	–	–	–	–	4
Malaria	–	–	–	–	–	–	–	–	–	–	–	4	183	181	126	13	–	2	–	–	509
Measles	656	1741	2653	3527	3809	4983	6484	5151	3039	1697	2575	544	172	110	119	34	12	9	8	1077	38400
Meningitis, Meningococcal	10	8	8	10	6	4	5	–	3	1	11	13	7	2	5	2	7	13	–	1	116
Meningitis, Pfeiffer Bacillus	13	11	–	4	5	–	1	1	1	–	–	–	–	–	–	–	1	1	–	–	38
Meningitis, Pneumococcal	3	1	1	2	1	2	–	1	1	–	1	2	2	4	4	4	10	6	3	–	48
Meningitis, Other Forms	1	1	–	1	1	–	–	–	–	–	2	–	–	–	–	1	2	1	–	–	10
Meningitis, Undetermined	5	4	3	1	1	1	–	3	2	1	4	2	4	2	2	2	3	3	–	1	44
Mumps	20	100	186	288	351	558	762	712	571	371	910	285	122	92	173	77	31	19	3	179	5810
Pneumonia, Lobar	42	30	26	28	18	33	28	29	14	18	52	77	60	55	133	180	202	279	147	32	1483
Poliomyelitis	5	10	19	20	32	23	23	22	24	20	87	35	17	16	21	3	1	–	–	–	378
Psittacosis	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	2
Rocky Mountain Spotted Fever	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1
Salmonellosis	21	4	6	8	3	3	3	1	3	2	29	6	3	7	27	21	18	7	8	–	180
Scarlet Fever	28	124	320	505	502	540	661	508	382	342	1107	444	161	97	128	59	17	8	3	143	6079
Septic Sore Throat	–	3	4	7	4	6	11	7	4	6	10	19	22	9	23	19	12	4	–	9	179
Syphilis	9	2	2	1	2	4	2	4	1	2	25	208	1188	955	1041	609	506	304	68	37	4970
Tetanus	1	–	1	–	–	–	1	–	1	–	3	1	–	–	1	1	1	1	1	–	13
Trachoma	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	2
Trichinosis	–	–	–	–	–	–	–	–	–	–	2	6	7	3	6	5	2	1	–	6	38
Tuberculosis, Pulmonary	5	6	4	6	9	10	6	6	3	5	29	157	309	315	455	483	455	314	157	124	2858
Tuberculosis, Other Forms	6	6	4	4	1	4	4	–	3	–	10	10	20	14	31	22	14	14	8	4	179
Tularemia	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	1	–	–	2
Typhoid Fever	–	2	1	–	–	1	–	1	2	1	2	3	1	2	4	5	5	2	1	–	33
Typhus Fever	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	1	–	–	–	3
Undulant Fever	–	–	–	–	–	–	–	–	–	–	–	5	3	4	17	11	9	2	1	–	52
Whooping Cough	548	424	668	701	690	764	841	608	427	230	334	40	15	10	22	7	3	6	3	173	6514

TABLE XII — *Cases of Reportable Diseases by Ages for 1947*

DISEASE	Under 1 Year	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 to 14 years	15 to 19 years	20 to 24 years	25 to 29 years	30 to 39 years	40 to 49 years	50 to 59 years	60 to 69 years	70 years and over	Age Unknown	Total
Actinomycosis	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1
Anthrax	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	2
Chicken Pox	543	728	912	1201	1525	2444	3444	2398	1561	905	1807	361	142	66	101	20	16	4	3	612	18793
Diphtheria	5	17	19	41	39	35	19	17	17	18	57	34	23	17	29	26	12	4	2	2	433
Dysentery, Amebic	–	–	–	–	–	–	–	–	–	–	–	–	2	2	2	2	1	1	–	–	10
Dysentery, Bacillary	8	8	1	7	8	9	7	1	5	1	11	12	12	8	10	14	13	19	34	–	188
Encephalitis, Infectious	–	1	–	–	1	–	–	–	1	2	2	–	–	–	–	–	–	1	–	–	8
German Measles	122	135	73	60	71	70	87	63	41	37	57	42	17	11	7	4	–	2	–	33	932
Gonorrhea	4	1	4	1	4	4	8	4	4	5	10	360	1390	992	757	175	47	8	1	26	3805
Hookworm	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	2
Lymphocytic Choriomeningitis	–	–	–	–	1	–	–	–	–	–	2	–	–	–	2	1	–	–	–	–	6
Malaria	–	–	–	–	–	–	–	–	–	–	–	4	24	20	29	3	2	1	–	8	91
Measles	318	589	787	1003	1286	1524	1915	1518	1049	592	830	136	69	34	68	15	10	4	4	314	12065
Meningitis, Meningococcal	5	4	5	–	1	1	1	1	–	1	3	5	3	2	9	1	1	1	3	–	47
Meningitis, Pfeiffer Bacillus	11	18	4	4	3	3	3	–	1	–	–	1	–	–	–	–	–	–	1	–	49
Meningitis, Pneumococcal	13	–	–	–	1	1	1	1	–	–	1	–	–	–	–	4	6	–	2	–	30
Meningitis, Other Forms	–	–	–	–	–	–	1	–	–	–	2	–	–	–	1	2	3	1	–	–	10
Meningitis, Undetermined	6	3	–	1	4	–	2	3	–	6	4	2	5	2	4	3	4	6	1	1	57
Mumps	42	117	236	357	538	1025	1345	1070	856	476	1165	307	133	118	198	76	27	18	8	277	8389
Pneumonia, Lobar	23	25	16	21	16	17	13	17	9	13	42	53	44	50	139	146	200	226	240	34	1344
Poliomyelitis	5	8	15	13	20	21	20	24	21	20	67	42	19	20	23	6	–	–	–	1	345
Rocky Mountain Spotted Fever	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	3
Salmonellosis	23	11	9	4	5	5	2	1	2	7	8	8	5	8	11	18	13	9	2	5	156
Scarlet Fever	14	98	263	390	443	534	529	411	303	242	690	159	67	52	68	28	16	1	2	114	4424
Septic Sore Throat	1	1	12	3	3	2	3	4	1	2	13	10	13	8	12	11	4	7	–	3	113
Syphilis	18	3	1	1	4	1	2	7	3	2	18	197	581	484	650	470	410	276	73	10	3211
Tetanus	–	–	–	–	1	–	1	–	–	1	2	1	–	–	1	–	1	2	–	–	10
Trachoma	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	2	1	1	–	1	7
Trichinosis	–	–	–	1	–	–	–	–	–	–	6	7	9	9	11	6	4	2	1	3	59
Tuberculosis, Pulmonary	6	8	10	7	6	5	4	4	5	2	24	123	315	267	438	402	461	287	132	102	2608
Tuberculosis, Other Forms	5	5	7	6	4	2	6	2	1	3	10	13	17	9	26	17	17	19	10	8	187
Tularemia	–	–	–	1	–	–	–	–	1	–	1	1	–	–	–	–	1	1	–	1	7
Typhoid Fever	–	–	1	–	1	–	–	1	3	2	3	3	1	1	1	4	1	–	1	–	23
Undulant Fever	–	–	–	–	1	–	2	1	–	1	1	1	2	8	14	17	10	10	2	6	76
Whooping Cough	643	476	575	679	745	866	959	684	458	283	371	47	23	13	41	18	8	4	4	224	7121

TABLE XII — *Cases of Reportable Diseases by Ages for 1948*

DISEASE	Under 1 Year	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 to 14 years	15 to 19 years	20 to 24 years	25 to 29 years	30 to 39 years	40 to 49 years	50 to 59 years	60 to 69 years	70 years and over	Age Unknown	Total
Actinomycosis	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	–	–	2
Anthrax	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	–	1	–	–	–	3
Chicken Pox	501	737	1059	1044	1326	2650	3672	2272	1438	834	1355	283	117	75	87	31	5	6	2	624	18118
Diphtheria	8	6	9	12	17	17	20	15	6	7	19	26	17	10	31	35	16	11	8	–	290
Dysentery, Amebic	–	–	–	–	–	1	1	–	–	–	–	–	1	–	1	1	–	–	–	–	5
Dysentery, Bacillary	–	3	2	–	1	1	3	1	2	–	3	3	5	8	8	6	9	19	47	–	121
Encephalitis, Infectious	1	3	2	1	1	3	4	6	3	–	4	–	2	3	–	–	1	–	–	–	34
German Measles	117	140	122	47	73	69	84	62	42	38	93	80	25	10	13	1	1	1	1	57	1076
Gonorrhea	3	2	1	1	2	7	3	6	3	1	13	313	1180	793	515	145	45	15	3	52	3103
Leprosy	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1
Lymphocytic Choriomeningitis	–	–	–	1	–	1	1	1	–	–	5	4	4	3	2	1	–	–	–	–	23
Malaria	–	–	–	–	–	–	–	–	–	–	–	2	7	5	6	1	1	–	–	1	23
Measles	632	1471	2664	2782	3439	5759	6923	4574	2641	1507	2122	419	126	78	106	28	13	14	5	1778	37081
Meningitis, Meningococcal	8	8	7	–	3	3	3	–	1	2	5	3	–	2	3	6	4	5	2	1	66
Meningitis, Pfeiffer Bacillus	14	9	9	3	2	1	3	–	–	–	–	1	–	–	1	1	–	–	–	–	44
Meningitis, Pneumococcal	7	2	2	–	1	1	2	1	–	1	1	–	1	–	2	1	6	1	1	–	30
Meningitis, Other Forms	4	–	–	–	3	–	–	–	–	1	2	–	–	–	–	–	–	–	–	1	11
Meningitis, Undetermined	6	–	2	5	4	1	3	3	–	3	8	–	6	2	5	2	5	1	2	–	58
Mumps	77	281	590	753	1149	2196	2979	2179	1502	943	1969	505	272	250	435	155	66	27	26	683	17037
Pneumonia, Lobar	31	23	23	22	12	28	18	18	21	9	47	56	42	53	159	173	196	193	212	55	1391
Poliomyelitis	–	5	7	7	13	6	15	4	9	4	37	23	18	12	10	3	2	–	–	–	175
Salmonellosis	8	6	5	4	3	3	–	–	1	2	2	4	–	4	8	3	6	6	1	6	72
Scarlet Fever	27	108	317	412	529	745	833	614	459	363	996	172	64	51	67	38	2	7	–	229	6033
Septic Sore Throat	1	1	4	3	4	4	8	2	3	2	10	11	5	10	4	4	2	1	1	5	85
Syphilis	14	1	–	2	2	1	2	1	2	–	10	118	345	352	426	380	369	218	58	12	2313
Tetanus	–	–	–	–	–	1	1	–	1	–	–	3	–	–	1	1	–	–	1	–	9
Trachoma	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	1	1	4
Trichinosis	–	–	–	–	–	–	1	–	–	–	1	6	11	6	11	4	2	–	–	–	42
Tuberculosis, Pulmonary	6	13	11	7	6	7	4	10	3	4	21	136	311	269	438	453	387	312	146	112	2656
Tuberculosis, Other Forms	4	6	7	2	3	3	–	1	1	3	9	7	9	13	24	22	17	18	6	11	166
Tularemia	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1
Typhoid Fever	–	1	2	1	3	1	1	1	2	–	4	1	1	3	1	5	2	3	1	–	33
Undulant Fever	–	–	–	1	–	1	–	–	–	–	4	4	3	11	1	6	3	4	1	–	39
Whooping Cough	275	197	291	256	273	393	325	258	163	85	149	10	4	2	16	5	–	–	3	73	2778

TABLE XII — *Cases for Reportable Diseases by Ages for 1949*

DISEASE	Under 1 Year	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 to 14 years	15 to 19 years	20 to 24 years	25 to 29 years	30 to 39 years	40 to 49 years	50 to 59 years	60 to 69 years	70 years and over	Age Unknown	Total
Actinomycosis	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1
Anthrax	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	1	–	–	3
Chicken Pox	669	968	1518	1415	1638	2753	4716	2840	1519	950	1556	362	138	92	134	32	13	4	4	811	22132
Diphtheria	5	9	18	23	15	17	19	14	8	7	23	31	25	21	37	36	15	4	6	–	333
Dysentery, Amebic	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	2	–	–	–	–	3
Dysentery, Bacillary	1	2	1	1	3	5	2	3	3	–	7	9	5	2	3	2	3	–	2	1	55
Encephalitis, Infectious	1	–	–	2	3	2	4	1	1	2	–	–	–	2	1	2	2	–	1	2	26
German Measles	115	197	185	131	114	237	445	436	382	282	943	733	86	35	90	31	15	1	–	97	4555
Gonorrhea	3	–	1	1	–	2	1	2	6	2	9	266	1076	797	495	127	43	12	3	74	2920
Hepatitis Infectious	–	–	1	–	–	1	1	3	2	1	6	4	6	6	6	9	4	2	–	4	56
Lymphocytic Choriomeningitis	–	–	1	–	–	–	2	1	–	–	3	1	–	–	–	1	–	–	–	–	9
Malaria	–	–	–	–	–	–	–	–	–	–	–	1	1	2	3	1	2	–	–	–	10
Measles	455	1223	1989	1957	2226	3792	5422	3270	1854	976	1775	453	131	85	113	39	14	3	6	611	26394
Meningitis, Meningococcal	4	7	5	4	2	2	–	1	–	–	9	3	4	1	2	2	1	2	1	–	50
Meningitis, Pfeiffer Bacillus	12	13	2	6	–	3	3	2	–	–	1	–	–	–	1	–	–	–	–	–	43
Meningitis, Pneumococcal	9	–	1	–	–	1	–	–	–	–	4	1	1	–	–	2	–	3	1	–	23
Meningitis, Other Forms	1	2	1	1	1	–	1	2	–	–	1	2	–	–	–	2	–	–	1	–	15
Meningitis, Undetermined	8	3	2	1	3	–	–	–	3	–	4	3	–	2	3	3	4	1	3	–	43
Mumps	48	178	406	501	622	1100	1785	1272	936	572	1274	324	161	165	280	90	45	23	12	388	10182
Poliomyelitis	27	64	98	74	88	71	109	109	75	86	355	185	149	149	119	21	2	1	–	–	1782
Rocky Mountain Spotted Fever	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1
Salmonellosis	8	5	7	6	2	4	–	1	–	2	2	–	–	7	3	2	4	4	5	68	130
Scarlet Fever	31	132	430	455	527	731	945	627	445	337	816	175	53	42	49	29	6	6	1	215	6052
Septic Sore Thro t	–	2	3	3	2	4	4	1	–	4	10	12	13	9	7	11	2	2	–	7	96
Syphilis	6	2	3	–	1	2	–	1	4	6	13	77	303	268	403	297	349	225	60	23	2043
Tetanus	–	–	–	–	1	–	1	1	–	–	–	2	–	1	1	2	–	–	1	1	11
Trachoma	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	4	6
Trichinosis	–	–	–	–	–	–	–	–	1	–	4	7	3	5	3	1	4	2	–	2	32
Tuberculosis, Pulmonary	3	6	8	3	4	6	2	4	1	4	15	99	244	236	415	428	379	298	171	125	2451
Tuberculosis, Other Forms	4	6	4	5	1	1	2	4	–	3	4	12	7	13	20	13	11	16	4	8	138
Tularemia	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	1	–	1	4
Typhoid Fever	–	–	1	–	1	–	–	–	–	–	4	3	1	–	6	5	4	3	2	–	30
Typhus Fever	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1
Undulant Fever	–	1	–	–	–	–	–	–	2	1	–	2	3	1	6	5	5	3	1	1	31
Whooping Cough	444	344	469	441	454	541	633	444	265	151	267	22	8	9	16	9	3	4	3	111	4638

TABLE XIII — *Cases of Reportable Diseases by Counties—1942*

DISEASE	Barnstable	Berkshire	Bristol	Dukes	Essex	Franklin	Hampden	Hampshire	Middlesex	Nantucket	Norfolk	Plymouth	Suffolk	Worcester	Military Estabs.	TOTAL
Actinomycosis	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	1
Anthrax	–	–	–	–	3	–	–	–	–	–	–	1	1	–	–	5
Chicken Pox	79	145	435	3	1,324	131	851	191	3,619	–	1,063	479	4,364	1463	20	14,167
Diphtheria	1	1	55	–	4	–	14	–	44	–	10	–	17	8	–	154
Dog Bite	100	105	461	–	1,336	70	633	81	2,897	7	885	286	2,926	912	2	10,701
Dysentery, Amebic	–	–	–	–	1	–	–	–	1	–	–	–	–	1	–	3
Dysentery, Bacillary	–	–	5	–	19	–	–	–	26	–	328	–	5	–	2	385
Encephalitis, Infectious	–	1	2	–	–	–	1	1	10	–	5	2	1	1	1	25
German Measles	71	44	342	–	499	27	215	768	1,211	–	337	206	2,102	1,654	521	7,997
Gonorrhea	38	27	201	1	198	13	208	16	418	–	126	86	1,292	138	1,692	4,454
Malaria	–	–	–	–	–	–	–	–	2	–	1	1	2	–	12	18
Measles	31	170	1,915	–	4,129	38	2,062	196	7,807	9	3,169	245	5,136	559	124	25,590
Meningitis, Meningococcal	1	1	11	–	13	2	7	2	44	–	13	10	42	24	21	191
Meningitis, Pfeiffer Bacillus	–	–	1	–	2	–	5	–	8	–	2	3	4	4	–	29
Meningitis, Pneumococcal	–	–	1	–	5	–	10	–	9	–	7	3	5	6	–	46
Meningitis, Other Forms*	–	2	2	–	1	–	1	1	3	–	3	3	11	2	–	29
Meningitis, Undetermined	–	1	–	–	1	–	1	–	3	–	2	1	1	–	–	10
Mumps	104	390	441	8	2,379	553	748	1,095	3,949	–	2,157	422	2,684	708	260	15,898
Ophthalmia, Neonatorum**	5	4	62	–	28	1	29	1	122	–	5	96	290	33	–	675
Pneumonia, Lobar	13	52	120	–	304	5	216	86	797	–	317	80	756	409	135	3,290
Poliomyelitis	–	3	1	–	2	3	5	2	6	–	5	–	5	4	–	36
Salmonellosis	1	1	2	–	12	2	4	4	33	–	15	2	19	14	–	109
Scarlet Fever	81	96	1,363	–	383	157	1,798	334	2,375	–	514	522	2,818	1,025	60	11,526
Septic Sore Throat	2	1	6	–	17	4	2	2	51	–	11	6	48	20	1	171
Syphilis	51	95	356	2	469	35	426	45	895	1	233	205	2,151	366	367	5,897
Tetanus	–	–	1	–	1	–	3	–	2	–	1	2	1	–	–	11
Trachoma	–	–	–	–	–	–	–	–	2	–	2	–	3	2	–	9
Trichinosis	–	–	2	–	–	–	–	2	6	–	–	1	4	1	3	19
Tuberculosis, Pulmonary	24	36	250	1	337	21	197	24	631	1	224	89	957	273	10	3,075
Tuberculosis, Other Forms	–	7	16	2	18	1	10	3	56	–	8	3	56	18	1	199
Typhoid Fever	–	6	3	–	2	–	–	–	11	–	5	1	13	9	–	50
Typhus Fever	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	2
Undulant Fever	1	3	–	–	5	3	3	–	7	–	2	2	9	–	–	35
Whooping Cough	104	197	377	–	1,122	58	810	203	2,071	4	835	270	2,267	2,610	4	10,932

* Meningitis, other forms includes cases of known etiological agents: B. coli, mumps, staphyloccal, streptococcal and torula.

** Ophthalmia Neonatorum includes cases of suppurative conjunctivitis for every year except 1949.

TABLE XIII — *Cases of Reportable Diseases by Counties—1943*

DISEASE	Barnstable	Berkshire	Bristol	Dukes	Essex	Franklin	Hampden	Hampshire	Middlesex	Nantucket	Norfolk	Plymouth	Suffolk	Worcester	Military Estabs.	TOTAL
Actinomycosis	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	2
Anthrax	–	–	–	–	4	–	–	–	1	–	–	–	–	–	–	5
Chicken Pox	77	279	524	–	1,120	58	584	232	3,026	–	1,342	677	2,268	1,296	55	11,538
Diphtheria	4	–	22	–	10	–	1	1	51	–	6	–	38	5	2	140
Dog Bite	79	101	403	–	1,230	50	664	64	2,682	1	746	251	2,787	929	7	9,994
Dysentery, Amebic	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1
Dysentery, Bacillary	–	3	–	–	11	–	15	6	114	–	8	2	38	21	–	218
Encephalitis, Infectious	1	1	–	–	2	–	4	1	12	–	5	2	–	6	–	34
German Measles	216	453	1,120	12	5,133	411	672	717	9,737	–	3,526	1,605	5,895	2,270	2,381	34,148
Gonorrhea	41	28	188	2	232	17	314	18	437	1	154	79	1,308	129	1,753	4,701
Leprosy	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	1
Lymphocytic Choriomeningitis	–	–	–	–	–	–	1	–	–	–	–	1	2	–	–	4
Malaria	6	–	1	–	1	1	3	4	34	–	1	–	60	5	–	116
Measles	347	1,317	2,463	39	1,764	712	1,708	366	8,242	32	3,217	1,192	5,354	7,999	346	35,098
Meningitis, Meningococcal	13	5	42	–	36	4	30	3	129	–	40	33	188	78	135	736
Meningitis, Pfeiffer Bacillus	–	1	–	–	6	1	5	1	8	–	–	2	7	5	–	36
Meningitis, Pneumococcal	1	1	4	–	7	–	6	–	13	–	5	3	6	12	–	58
Meningitis, Other Forms*	–	–	1	–	3	1	3	–	2	–	1	–	17	–	–	28
Meningitis, Undetermined	3	1	4	–	10	–	9	–	32	–	17	4	32	18	–	130
Mumps	16	318	236	1	453	22	450	50	1,681	–	658	179	1,223	1,191	609	7,087
Ophthalmia, Neonatorum**	–	–	58	–	17	–	43	–	40	–	4	73	325	31	2	593
Pneumonia, Lobar	10	49	94	–	231	7	230	80	747	–	228	73	959	271	125	3,104
Poliomyelitis	1	14	39	–	79	2	5	7	54	–	19	4	19	8	1	252
Salmonellosis	1	5	1	–	79	6	3	–	24	–	8	2	7	22	–	158
Scarlet Fever	152	197	700	–	643	79	2,810	261	3,142	–	1,018	273	4,427	1,250	448	15,400
Septic Sore Throat	1	4	9	–	19	–	2	10	20	–	5	9	77	4	–	160
Syphilis	57	106	348	4	443	26	423	29	772	1	207	156	1,973	323	652	5,520
Tetanus	1	–	2	–	3	–	1	–	3	–	–	2	1	1	–	14
Trachoma	–	–	1	–	–	–	–	–	2	–	3	–	7	–	–	13
Trichinosis	–	–	1	–	–	–	–	–	1	–	2	–	7	2	–	13
Tuberculosis, Pulmonary	20	46	247	5	245	23	170	29	513	1	178	76	941	245	–	2,739
Tuberculosis, Other Forms	–	3	12	25	1	13	–	57	–	–	14	4	64	27	1	221
Tularemia	2	–	–	–	–	–	–	–	1	–	–	–	–	–	–	3
Typhoid Fever	–	2	6	–	4	–	2	–	8	–	4	1	5	2	–	34
Typhus Fever	1	1	–	–	–	–	–	–	–	–	–	–	1	–	–	3
Undulant Fever	–	8	4	–	6	2	3	1	7	–	2	2	2	6	–	43
Weil's Disease	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	2
Whooping Cough	29	224	613	–	791	86	192	133	1,295	–	389	210	1,402	626	–	5,990

*Meningitis other forms includes cases of known etiological agents: mumps, staphyloccal, streptococcal.
**Ophthalmia Neonatorum includes cases of suppurative conjunctivitis for every year except 1949.

TABLE XIII — *Cases of Reportable Diseases by Counties—1944*

DISEASE	Barnstable	Berkshire	Bristol	Dukes	Essex	Franklin	Hampden	Hampshire	Middlesex	Nantucket	Norfolk	Plymouth	Suffolk	Worcester	Military Estabs.	TOTAL
Actinomycosis	–	–	1	–	–	–	1	–	3	–	–	–	–	–	–	5
Anthrax	–	–	–	–	1	–	–	–	2	–	1	–	–	–	–	4
Chicken Pox	126	400	1,057	–	1,709	50	1,168	281	5,011	1	2,474	628	4,224	2,300	60	19,489
Diphtheria	6	–	22	–	46	–	–	–	88	–	6	3	52	6	–	229
Dog Bite	101	87	377	–	1,227	46	639	61	2,748	5	791	269	2,874	863	1	10,089
Dysentery, Amebic	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	2
Dysentery, Bacillary	–	–	10	–	18	–	2	3	42	–	27	1	23	113	–	239
Encephalitis, Infectious	–	–	4	–	4	–	3	–	4	–	4	–	–	4	–	23
German Measles	38	55	79	–	118	9	196	328	331	–	132	30	303	220	99	1,938
Gonorrhea	33	36	190	6	347	28	343	24	624	–	164	89	1,609	182	1,260	4,935
Hookworm	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1	2
Lymphocytic Choriomeningitis	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	1
Malaria	–	–	1	–	1	–	1	–	1	–	1	1	1	–	565	572
Measles	170	174	1,093	7	3,213	96	1,626	920	5,045	–	2,041	378	4,470	503	101	19,837
Meningitis, Meningococcal	11	6	25	1	26	3	29	6	92	–	36	15	149	36	21	456
Meningitis, Pfeiffer Bacillus	–	3	1	1	6	–	3	–	6	–	5	5	7	1	–	38
Meningitis, Pneumococcal	1	–	5	–	9	–	6	2	15	–	5	2	19	7	–	71
Meningitis, Other Forms*	2	–	4	–	2	–	–	–	2	–	1	–	9	–	–	20
Meningitis, Undetermined	–	–	8	–	6	–	15	–	23	–	13	7	16	20	–	108
Mumps	116	579	370	–	677	13	260	112	2,303	–	1,390	641	2,486	1,744	343	11,034
Ophthalmia, Neonatorum**	–	–	45	–	27	–	35	–	113	–	4	57	278	24	–	583
Pneumonia, Lobar	14	44	76	–	143	10	153	86	495	–	231	53	1,400	292	62	3,059
Poliomyelitis	–	81	5	–	23	12	138	12	55	–	20	17	43	24	6	436
Rocky Mountain Spotted Fever	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	2
Salmonellosis	–	3	7	–	27	–	4	–	43	–	12	–	8	16	–	120
Scarlet Fever	34	421	235	–	525	46	1,223	147	2,710	–	986	691	2,372	2,281	285	11,956
Septic Sore Throat	1	6	6	–	28	1	1	3	26	–	5	9	90	3	9	188
Syphilis	39	58	314	3	401	32	348	27	780	3	165	146	1,815	238	699	5,068
Tetanus	–	1	3	–	2	–	1	–	2	–	4	2	2	1	–	18
Trachoma	–	1	–	1	1	–	–	–	3	–	–	–	2	–	–	8
Trichinosis	1	–	1	–	2	–	–	2	7	–	3	–	15	–	–	31
Tuberculosis, Pulmonary	15	34	277	2	257	19	173	23	521	3	166	74	845	270	–	2,679
Tuberculosis, Other Forms	1	5	20	–	23	–	10	1	50	–	12	7	54	9	1	193
Tularemia	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1
Typhoid Fever	–	–	5	–	5	–	3	–	4	–	1	1	8	5	–	32
Typhus Fever	–	–	–	–	–	–	–	–	–	–	–	–	2	–	1	3
Undulant Fever	2	4	3	–	3	2	1	1	7	–	2	4	7	10	–	46
Weil's Disease	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	2
Whooping Cough	4	50	363	–	168	25	333	130	1,088	–	298	116	827	646	3	4,051

* Meningitis other forms includes cases of known etiological agents: mumps, staphyloccal, streptococcal.

** Ophthalmia Neonatorum includes cases of suppurative conjunctivitis for every year except 1949.

TABLE XIII — *Cases of Reportable Diseases by Counties—1945*

DISEASE	Barnstable	Berkshire	Bristol	Dukes	Essex	Franklin	Hampden	Hampshire	Middlesex	Nantucket	Norfolk	Plymouth	Suffolk	Worcester	Military Estabs.	TOTAL
Actinomycosis	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	2
Anthrax	–	–	–	–	2	–	–	–	–	–	2	–	–	–	–	4
Chicken Pox	165	401	462	–	737	226	792	215	3,153	–	1,042	234	1,636	1,313	25	10,401
Diphtheria	2	1	25	–	20	–	6	1	60	–	7	7	49	7	9	194
Dog Bite	110	135	459	–	1,426	76	648	76	2,653	2	895	268	2,805	1,032	–	10,585
Dysentery, Amebic	–	–	–	–	–	–	–	–	–	–	–	–	1	–	17	18
Dysentery, Bacillary	–	1	–	–	10	–	2	1	83	–	19	–	18	106	5	245
Encephalitis, Infectious	1	2	–	–	1	–	–	–	8	–	2	1	1	2	–	18
German Measles	6	39	61	–	87	16	87	77	284	–	110	42	204	253	42	1,308
Gonorrhea	20	55	231	1	544	31	331	23	674	–	154	86	1,989	202	1,146	5,487
Hookworm	–	–	–	–	–	–	–	–	–	–	–	–	–	–	8	8
Lymphocytic Choriomeningitis	–	–	–	–	1	–	–	–	1	–	1	–	3	2	–	8
Measles	21	18	97	–	1,292	14	132	135	1,514	–	760	60	2,325	1,070	48	7,486
Meningitis, Meningococcal	–	4	12	–	14	1	16	2	24	–	14	7	51	13	3	161
Meningitis, Pfeiffer Bacillus	–	–	2	1	2	1	3	1	9	–	3	2	6	2	–	32
Meningitis, Pneumococcal	–	–	4	–	3	–	1	2	9	–	2	1	15	5	–	42
Meningitis, Other Forms*	–	–	3	–	1	–	2	–	4	–	4	2	7	2	–	25
Meningitis, Undetermined	–	1	–	–	5	–	8	1	5	–	4	1	12	4	–	41
Mumps	85	52	1,075	–	2,214	120	1,532	248	4,009	–	1,808	563	2,952	941	128	15,727
Ophthalmia, Neonatorum**	–	–	46	–	15	–	39	–	31	–	2	56	274	32	–	495
Pneumonia, Lobar	4	12	71	–	127	5	117	76	335	–	157	30	991	180	32	2,137
Poliomyelitis	10	41	5	1	62	9	22	6	132	–	55	16	131	34	3	527
Rocky Mountain Spotted Fever	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1
Salmonellosis	1	1	–	–	27	–	1	4	30	–	40	–	20	–	–	124
Scarlet Fever	20	591	341	–	788	88	972	122	2,453	1	788	715	2,033	1,334	127	10,373
Septic Sore Throat	–	12	18	–	39	1	–	–	19	–	8	2	96	3	2	200
Syphilis	26	52	319	3	343	18	323	30	616	4	160	164	1,692	252	376	4,378
Tetanus	–	–	–	–	1	–	1	–	4	–	–	2	2	2	–	12
Trachoma	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1
Trichinosis	1	3	2	–	2	–	–	–	3	–	–	–	14	3	–	28
Tuberculosis, Pulmonary	19	44	219	1	229	19	133	34	581	1	187	84	793	287	44	2,675
Tuberculosis, Other Forms	–	2	22	1	15	2	7	1	44	–	8	5	43	14	–	164
Typhoid Fever	–	2	3	–	1	–	4	1	3	–	–	–	4	–	–	18
Undulant Fever	–	5	6	–	5	3	3	5	2	–	2	2	2	11	3	49
Weil's Disease	–	–	–	–	–	–	1	2	–	–	–	–	–	–	–	3
Whooping Cough	65	281	342	–	1,154	79	317	103	1,598	1	415	475	1,843	772	–	7,445

* Meningitis, other forms includes cases of known etiological agents: B. coli, staphyloccal, streptococcal.

** Ophthalmia Neonatorum includes cases of suppurative conjunctivitis for every year except 1949.

TABLE XIII — *Cases of Reportable Diseases by Counties—1946*

DISEASE	Barnstable	Berkshire	Bristol	Dukes	Essex	Franklin	Hampden	Hampshire	Middlesex	Nantucket	Norfolk	Plymouth	Suffolk	Worcester	Military Estabs.	TOTAL
Actinomycosis	–	–	–	–	1	–	2	–	–	–	–	–	–	–	–	3
Anthrax	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	2
Chicken Pox	58	470	856	–	971	55	469	406	2,844	1	1,115	424	2,470	1,771	2	11,912
Diphtheria	4	–	36	–	25	2	9	2	149	–	12	18	167	14	1	439
Dog Bite	137	138	479	–	1,404	81	744	93	2,836	4	1,014	386	3,154	1,087	2	11,559
Dysentery, Amebic	–	–	–	–	–	–	–	–	1	–	1	–	1	–	4	7
Dysentery, Bacillary	–	–	–	–	5	–	2	1	16	–	26	–	9	9	–	68
Encephalitis, Infectious	1	1	1	–	1	–	–	–	–	–	–	–	4	–	–	8
German Measles	5	171	75	–	146	15	1,306	321	531	–	225	42	449	1,328	4	4,618
Gonorrhea	25	68	346	–	386	25	368	53	674	–	146	116	2,173	299	383	5,062
Hookworm	–	–	–	–	1	–	–	–	–	–	1	–	–	–	1	3
Lymphocytic Choriomeningitis	–	–	–	–	–	–	2	–	2	–	–	–	–	–	–	4
Malaria	3	4	20	–	63	5	19	2	104	1	35	17	133	67	36	509
Measles	267	853	2,378	1	4,200	398	2,732	335	9,578	1	2,794	1,223	6,533	7,101	6	38,400
Meningitis, Meningococcal	–	4	11	–	10	1	7	–	30	–	12	2	23	15	1	116
Meningitis, Pfeiffer Bacillus	1	1	6	–	5	–	3	–	6	–	2	2	7	5	–	38
Meningitis, Pneumococcal	–	1	3	–	5	–	1	2	10	–	3	3	13	7	–	48
Meningitis, Other Forms*	–	–	1	–	–	–	1	1	2	–	1	1	2	1	–	10
Meningitis, Undetermined	–	3	1	–	6	–	4	1	9	1	4	1	4	8	2	44
Mumps	16	649	126	–	348	315	576	241	1,316	6	301	166	478	1,257	15	5,810
Ophthalmia, Neonatorum**	–	1	47	–	7	–	49	–	25	–	1	36	299	20	–	485
Pneumonia, Lobar	5	29	68	1	98	5	102	60	393	2	174	35	322	175	14	1,483
Poliomyelitis	4	14	12	–	24	11	8	16	93	–	34	9	33	120	–	378
Psittacosis	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	2
Rocky Mountain Spotted Fever	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Salmonellosis	3	–	–	–	73	6	5	7	39	–	4	8	27	8	–	180
Scarlet Fever	20	104	413	–	834	78	411	83	1,455	1	469	257	1,106	801	47	6,079
Septic Sore Throat	–	12	4	–	53	4	1	–	21	–	8	1	74	1	–	179
Syphilis	42	109	392	5	525	27	426	47	713	4	197	186	1,802	346	149	4,970
Tetanus	–	3	2	–	1	–	1	–	1	–	2	1	1	1	–	13
Trachoma	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	2
Trichinosis	1	4	5	–	1	–	–	–	8	–	2	1	14	2	–	38
Tuberculosis, Pulmonary	26	46	248	1	229	10	156	43	550	2	221	69	956	286	15	2,858
Tuberculosis, Other Forms	2	2	11	–	21	–	13	1	45	1	5	3	66	9	–	179
Tularemia	–	–	–	1	–	–	–	–	–	–	–	–	1	–	–	2
Typhoid Fever	–	1	1	–	5	–	6	–	6	–	2	–	7	5	–	33
Typhus Fever	–	–	–	–	–	–	–	–	1	–	–	–	2	–	–	3
Undulant Fever	1	9	3	–	3	2	3	1	8	1	4	3	2	12	–	52
Whooping Cough	61	193	478	–	499	85	602	51	1,130	–	386	178	1,169	1,681	1	6,514

* Meningitis, other forms includes cases of known etiological agents: mumps, staphyloccal, streptococcal.

** Ophthalmia Neonatorum includes cases of suppurative conjunctivitis for every year except 1949.

TABLE XIII — *Cases of Reportable Diseases by Counties—1947*

DISEASE	Barnstable	Berkshire	Bristol	Dukes	Essex	Franklin	Hampden	Hampshire	Middlesex	Nantucket	Norfolk	Plymouth	Suffolk	Worcester	Military Estabs.	TOTAL
Actinomycosis	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	1
Anthrax	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	2
Chicken Pox	48	433	1,013	–	2,164	184	965	194	4,630	2	2,123	648	3,672	2,717	–	18,793
Diphtheria	1	2	18	–	17	2	24	7	78	–	17	8	251	8	–	433
Dog Bite	123	153	512	–	1,383	77	730	77	2,686	3	914	394	2,836	1,094	–	10,982
Dysentery, Amebic	–	–	2	–	1	–	–	–	1	–	1	–	4	1	–	10
Dysentery, Bacillary	–	–	–	–	15	1	–	–	19	–	58	–	6	89	–	188
Encephalitis, Infectious	–	–	3	–	–	–	–	–	–	–	2	3	–	–	–	8
German Measles	13	26	51	–	62	16	80	61	211	–	81	30	174	127	–	932
Gonorrhea	21	30	183	2	282	8	275	18	480	–	103	63	1,831	176	333	3,805
Hookworm	–	–	–	–	–	–	–	–	1	–	–	–	–	1	–	2
Lymphocytic Choriomeningitis	–	1	–	–	–	–	–	–	2	–	2	–	–	1	–	6
Malaria	1	2	6	–	15	1	4	1	23	1	2	2	21	12	–	91
Measles	383	157	1,985	–	210	105	725	283	1,710	–	1,571	1,887	1,741	1,308	–	12,065
Meningitis, Meningococcal	–	2	3	–	3	2	1	–	14	–	5	1	13	3	–	47
Meningitis, Pfeiffer Bacillus	–	–	2	–	3	–	6	2	12	–	4	3	9	8	–	49
Meningitis, Pneumococcal	–	1	–	–	5	1	1	–	12	–	1	–	6	3	–	30
Meningitis, Other Forms*	–	–	1	–	–	–	1	–	3	–	3	–	1	1	–	10
Meningitis, Undetermined	–	6	5	–	5	–	7	2	12	–	4	4	1	11	–	57
Mumps	27	189	121	–	539	25	117	129	2,017	1	1,108	398	1,572	2,146	–	8,389
Ophthalmia, Neonatorum**	–	–	36	–	13	2	63	1	40	–	2	74	293	77	–	601
Pneumonia, Lobar	8	16	42	–	76	2	83	34	293	–	80	33	469	208	–	1,344
Poliomyelitis	5	13	46	–	40	3	10	4	84	–	47	16	45	32	–	345
Rocky Mountain Spotted Fever	2	–	–	–	–	–	–	–	–	–	–	–	–	1	–	3
Salmonellosis	1	3	6	–	31	1	10	–	41	–	6	5	26	26	–	156
Scarlet Fever	25	58	448	–	1,193	37	213	37	690	–	376	197	636	514	–	4,424
Septic Sore Throat	1	–	2	–	25	5	2	1	11	–	3	2	53	8	–	113
Syphilis	19	74	207	3	233	23	272	17	412	1	129	110	1,376	257	78	3,211
Tetanus	–	2	1	–	–	–	1	–	2	–	1	1	2	–	–	10
Trachoma	–	–	–	–	–	–	–	1	1	–	1	–	3	1	–	7
Trichinosis	1	8	8	–	4	–	1	–	10	–	1	4	19	3	–	59
Tuberculosis, Pulmonary	23	47	201	2	248	8	154	34	507	4	174	100	843	263	–	2,608
Tuberculosis, Other Forms	2	2	29	–	10	1	14	2	34	–	4	8	70	11	–	187
Tularemia	2	–	–	–	–	–	2	–	–	–	–	2	–	1	–	7
Typhoid Fever	–	1	4	–	2	1	–	–	3	–	1	–	5	6	–	23
Undulant Fever	–	2	4	–	4	2	7	3	6	–	5	–	3	40	–	76
Whooping Cough	92	179	723	–	595	35	556	120	1,461	3	630	424	1,312	991	–	7,121

* Meningitis other forms includes cases of known etiological agents: mumps, staphylococcal, streptococcal.

** Ophthalmia Neonatorum includes cases of suppurative conjunctivitis for every year except 1949.

TABLE XIII — *Cases of Reportable Diseases by Counties—1948*

DISEASE	Barnstable	Berkshire	Bristol	Dukes	Essex	Franklin	Hampden	Hampshire	Middlesex	Nantucket	Norfolk	Plymouth	Suffolk	Worcester	Military Estabs.	TOTAL
Actinomycosis	–	–	–	–	–	–	–	–	1	–	–	1	–	–	–	2
Anthrax	–	–	–	–	2	–	–	–	–	–	–	–	1	–	–	3
Chicken Pox	125	539	852	–	1,939	369	1,407	463	4,326	–	1,986	868	2,967	2,277	–	18,118
Diphtheria	–	–	8	–	12	1	8	–	74	–	17	8	157	5	–	290
Dog Bite	143	154	591	–	1,414	82	822	83	2,836	2	894	352	3,241	1,143	–	11,757
Dysentery, Amebic	–	–	–	–	–	–	–	–	3	–	–	–	2	–	–	5
Dysentery, Bacillary	–	–	–	–	5	–	1	–	12	–	3	–	3	97	–	121
Encephalitis, Infectious	–	2	1	–	2	–	2	–	11	–	3	–	–	13	–	34
German Measles	9	105	62	–	75	17	83	39	255	–	89	21	201	120	–	1,076
Gonorrhea	1	12	156	–	151	5	207	8	286	–	58	25	1,527	139	528	3,103
Leprosy	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1
Lymphocytic Choriomeningitis	1	–	–	–	1	–	–	–	6	–	–	2	1	12	–	23
Malaria	1	–	1	–	1	1	2	1	10	–	3	–	3	–	–	23
Measles	134	1,052	1,552	–	3,029	658	827	799	9,810	2	4,320	211	8,601	6,086	–	37,081
Meningitis, Meningococcal	1	2	6	–	3	–	2	2	21	–	7	–	16	6	–	66
Meningitis, Pfeiffer Bacillus	–	1	2	–	8	–	8	3	11	–	3	1	2	5	–	44
Meningitis, Pneumococcal	1	–	1	–	5	–	5	1	8	–	3	–	4	2	–	30
Meningitis, Other Forms*	–	1	–	–	1	–	1	–	6	–	2	–	–	–	–	11
Meningitis, Undetermined	–	3	1	–	3	–	4	1	13	–	8	3	3	19	–	58
Mumps	310	185	450	–	2,531	102	1,399	262	4,830	–	2,109	418	3,529	912	–	17,037
Ophthalmia, Neonatorum**	–	–	35	–	7	5	60	2	39	–	6	64	195	63	–	476
Pneumonia, Lobar	5	27	47	–	77	1	106	36	258	–	105	15	593	121	–	1,391
Poliomyelitis	1	6	6	–	25	–	22	3	38	–	9	8	13	44	–	175
Salmonellosis	1	1	2	–	15	–	2	1	22	–	7	4	7	10	–	72
Scarlet Fever	14	77	552	–	495	23	156	37	1,406	–	429	118	1,951	775	–	6,033
Septic Sore Throat	3	1	5	–	5	2	–	1	12	–	3	1	49	3	–	85
Syphilis	24	36	180	–	171	16	176	13	301	1	100	72	968	142	113	2,313
Tetanus	–	1	–	–	1	–	–	–	4	–	–	–	–	3	–	9
Trachoma	–	–	1	–	1	–	–	–	1	–	–	–	–	1	–	4
Trichinosis	–	–	14	–	7	–	–	–	12	–	–	5	4	–	–	42
Tuberculosis, Pulmonary	19	60	222	3	203	13	165	46	452	1	156	89	959	268	–	2,656
Tuberculosis, Other Forms	2	5	25	–	19	1	10	4	25	1	15	3	45	11	–	166
Tularemia	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Typhoid Fever	–	–	8	–	3	–	4	–	3	–	1	1	12	1	–	33
Undulant Fever	–	3	3	–	2	–	1	1	10	–	3	4	2	10	–	39
Whooping Cough	18	101	246	–	450	30	84	2	557	–	145	118	638	389	–	2,778

* Meningitis, other forms includes cases of known etiological agents: B. coli, mumps, staphyloccal, streptococcal.

** Ophthalmia Neonatorum includes cases of suppurative conjunctivitis for every year except 1949.

TABLE XIII — *Cases of Reportable Diseases by Counties—1949*

DISEASE	Barnstable	Berkshire	Bristol	Dukes	Essex	Franklin	Hampden	Hampshire	Middlesex	Nantucket	Norfolk	Plymouth	Suffolk	Worcester	Military Estabs.	TOTAL
Actinomycosis	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	1
Anthrax	–	–	–	–	1	–	–	–	2	–	–	–	–	–	–	3
Chicken Pox	203	447	1,557	–	2,295	123	1,618	313	5,592	–	3,218	847	3,479	2,440	–	22,132
Diphtheria	–	1	8	–	14	–	–	2	61	–	10	1	222	14	–	333
Dog Bite	175	119	586	–	1,430	67	805	104	3,022	8	1,067	426	3,238	1,162	–	12,209
Dysentery, Amebic	–	–	–	–	2	–	–	–	–	–	1	–	–	–	–	3
Dysentery, Bacillary	–	1	–	–	–	–	–	–	13	–	8	1	24	8	–	55
Encephalitis, Infectious	–	–	5	–	3	–	6	–	4	–	3	2	–	3	–	26
German Measles	17	197	108	2	536	168	209	50	905	–	705	174	308	1,176	–	4,555
Gonorrhea	10	7	112	2	168	–	208	10	257	–	75	39	1,855	92	85	2,920
Hepatitis, Infectious	–	2	–	–	6	–	2	–	6	–	35	–	3	2	–	56
Lymphocytic Choriomeningitis	–	–	2	–	–	–	1	–	3	–	–	–	1	2	–	9
Malaria	–	–	–	–	4	–	–	1	4	–	–	–	1	–	–	10
Measles	203	2,304	3,022	–	2,504	390	5,012	462	3,001	1	1,509	607	1,273	6,106	–	26,394
Meningitis, Meningococcal	–	–	5	–	10	1	5	1	12	–	5	3	6	2	–	50
Meningitis, Pfeiffer Bacillus	1	1	4	–	6	–	5	–	10	–	3	5	1	7	–	43
Meningitis, Pneumococcal	1	–	1	–	6	–	–	–	5	–	3	–	2	5	–	23
Meningitis, Other Forms*	–	–	3	–	1	–	–	–	7	–	3	1	–	–	–	15
Meningitis, Undetermined	–	2	10	–	5	1	2	1	9	–	5	3	1	4	–	43
Mumps	421	240	1,568	–	986	92	810	516	2,079	–	715	674	805	1,276	–	10,182
Ophthalmia, Neonatorum**	–	–	18	–	3	–	5	–	1	–	–	11	104	20	–	162
Poliomyelitis	31	39	77	1	192	10	62	12	518	1	249	106	319	165	–	1,782
Rocky Mountain Spotted Fever	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Salmonellosis	–	–	3	–	12	3	1	–	15	–	72	1	21	2	–	130
Scarlet Fever	31	110	606	–	661	20	267	41	988	–	475	115	1,748	990	–	6,052
Septic Sore Throat	2	1	3	–	10	–	–	–	13	–	4	–	50	13	–	96
Syphilis	23	37	153	2	156	22	155	28	273	1	95	61	850	134	53	2,043
Tetanus	–	1	1	–	2	1	–	–	1	–	2	2	–	1	–	11
Trachoma	–	–	–	–	–	–	–	–	1	–	3	1	1	–	–	6
Trichinosis	–	1	2	–	1	–	–	1	9	–	3	2	9	4	–	32
Tuberculosis, Pulmonary	17	34	203	3	222	13	135	40	462	1	156	64	884	217	–	2,451
Tuberculosis, Other Forms	–	3	20	–	12	1	6	4	25	–	7	5	46	9	–	138
Tularemia	–	–	–	3	–	–	–	–	–	–	–	1	–	–	–	4
Typhoid Fever	–	–	1	–	4	–	1	–	9	–	2	3	5	5	–	30
Typhus Fever	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1
Undulant Fever	1	4	2	–	3	–	1	1	10	–	1	2	1	5	–	31
Whooping Cough	11	163	146	–	310	37	450	65	815	–	144	46	1,295	1,156	–	4,638

* Meningitis other forms includes cases of known etiological agents: B. coli, mumps, staphyloccal, streptococcal and torula.

** Ophthalmia Neonatorum includes cases of suppurative conjunctivitis for every year except 1949.

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Table XIV—*Number and Kind of Specimens*

	1940	1941	1942	1943	1944
Blood Typing Tests Pre-natal	–	–	–	–	–
Blood Typing Tests Bank Bloods	–	–	–	–	–
Diphtheria	6,614	5,463	5,521	4,922	6,578
Gonorrhea	13,070	12,590	10,753	8,964	10,386
Malaria	50	48	42	67	119
Miscellaneous	1,368	1,699	1,188	1,125	1,530
Pneumonia	3,608	3,247	2,347	2,072	1,337
Tuberculosis	7,565	6,937	6,319	5,807	5,903
Typhoid Fever					
Widal	3,037	2,730	2,674	1,804	1,642
Culture	12,814	11,019	9,455	9,304	7,992
Undulant Fever	1,966	2,686	1,958	1,988	1,848
Viral Serological Tests					
Influenza[3] A and B	–	–	–	–	–
Mumps Complement Fixation Tests	–	–	–	–	–
Total	50,092	46,379	40,357	36,053	37,335

	1945	1946	1947	1948	1949
Agglutinations	3,838	8,439	9,722	9,594	5,825
Blood Typing Tests Pre-natal	–	–	7,785	17,825	20,197
Blood Typing Tests Bank Bloods	–	1,376	24,917	28,549	31,470
Diphtheria	5,436	8,046	9,335	8,146	8,891
Enteric Pathogens	8,412	9,003	9,345	7,523	7,294
Gonorrhea	11,015	12,196	9,190	7,280	6,071
Malaria	196	725	449	254	161
Miscellaneous	1,359	2,821	1,207	1,097	893
Pneumonia	980	991	680	295	152
Tuberculosis	5,715	8,153	8,153	8,825	9,416
Viral Serological Tests					
Cold Agglutinins	–	–	–	–	18
Influenza A & B & FM	–	–	–	18	77
Lymphocytic Choriomeningitis[1]	–	–	–	–	12
Lymphogranuloma and Psittacosis	–	–	–	–	8
Mumps Complement—Fixation Tests	–	–	–	180	185
Total	36,951	49,415	80,783	89,586	90,670

Table XV—*Specimens and Examinations for 1942*

	Positive	Negative	Total Number of Specimens	Total Number of Examinations
Diphtheria:				
Diagnosis	82	4,875	4,957	11,526[1]
Release	87	477	564	564
Gonorrhea	946	9,907	10,853	21,706[2]
Malaria	0	42	42	42
Meningitis, Spinal fluid for	15	39	54	132[3]
Pneumonia:				
Pneumococci found and typed	835	–	768	835
Pneumococci not found	–	1,579	1,579	1,579
Tuberculosis:				
Sputum	613	5,016	5,629	5,629
Urine, spinal fluid, etc. (Culture and animal inoculations)	48	642	690	690
Typhoid fever:				
Widal	64	2,610[4]	2,674	5,736[5]
Culture (blood, feces, urine, etc.)	312	9,143	9,455	16,606[6]
Undulant fever	73	1,885	1,958	5,874[7]
Miscellaneous:				
Diphtheria virulence tests	22	9	31	31
Dysentery agglutination tests	0	101	101	101
Dysentery, amoebic	0	17	17	17
Vincent's angina (sent by dentists)	501	193	694	694
Weil-Felix reaction for Rickettsial diseases	14	68	82	82
Unclassified	–	–	209	744[8]
Total			40,357	72,588

[1] Includes examinations for hemolytic streptococci and the organisms of Vincent's angina.
[2] Includes examinations for average number of leucocytes per field.
[3] Includes examinations for influenza bacilli and other organisms.
[4] Includes 173 partial reactions.
[5] Includes 388 agglutination tests for paratyphoid A and 2,674 tests for paratyphoid B.
[6] Includes examinations for paratyphoid and dysentery bacilli.
[7] Includes examinations for agglutinins for typhoid and paratyphoid B.
[8] Includes miscellaneous examinations for identification of organisms.

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Table XV—*Specimens and Examinations in 1943*

	Positive	Negative	Total Number of Specimens	Total Number of Examinations
Diphtheria:				
Diagnosis:	114	4,249	4,363	10,092[1]
Release	252	307	559	559
Gonorrhea	1,130	7,834	8,964	17,928[2]
Malaria	10	57	67	67
Meningococci, Spinal fluid for	47	55	102	212[3]
Pneumonia:				
Pneumococci found and typed	871	–	795	871
Pneumococci not found	–	1,277	1,277	1,364
Tuberculosis:				
Sputum	560	4,465	5,025	5,025
Urine, spinal fluid, etc. (Culture and animal inoculations)	111	671	782	782
Typhoid fever:				
Widal	50	1,754[4]	1,804	3,835[5]
Culture (blood, feces, urine, etc.)	205	9,099	9,304	17,155[6]
Undulant fever	121	1,867	1,988	7,112[7]
Miscellaneous:				
Diphtheria virulence tests	39	19	58	58
Dysentery agglutination tests	0	103	103	103
Dysentery, Amoebic	0	53	53	53
Vincent's angina (sent by dentists)	293	93	386	386
Weil-Felix reaction for Rickettsial diseases	8	68	76	76
Unclassified	–	–	347	1,335[8]
Total			36,053	67,013

[1] Includes examinations for hemolytic streptococci and the organisms of Vincent's angina.

[2] Includes examinations for average number of leucocytes per field.

[3] Includes examinations for influenza bacilli and other organisms.

[4] Includes 142 partial reactions.

[5] Includes 227 agglutination tests for paratyphoid A and 1804 tests for paratyphoid B.

[6] Includes examinations for paratyphoid and dysentery bacilli.

[7] Includes examinations for agglutinins for typhoid and paratyphoid B and heterophile antibody.

[8] Includes miscellaneous examinations for identification of organisms.

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Table XV—*Specimens and Examinations in 1944*

	Positive	Negative	Total Number of Specimens	Total Number of Examinations
Diphtheria:				
Diagnosis	122	5,640	5,762	11,402 [1]
Release	346	470	816	816
Gonorrhea				
Smear	1,372	7,889	9,261	18,522 [2]
Culture	37	1,088	1,125	2,587
Malaria	21	98	119	119
Meningococci, Spinal fluid for	24	62	86	210 [3]
Pneumonia:				
Pneumococci found and typed	647	–	593	647
Pneumococci not found	–	744	744	828
Tuberculosis:				
Sputum	547	4,503	5,050	5,050
Urine, Spinal fluid, etc. (Culture and animal inoculations)	52	801	853	853
Typhoid fever:				
Widal	31	1,611	1,642 [4]	5,054 [5]
Culture (blood, feces, urine, etc.)	146	7,846	7,992	11,193 [6]
Undulant fever:	95	1,753	1,848	5,544 [7]
Miscellaneous:				
Diphtheria virulence tests	44	2	46	46
Dysentery agglutination tests	0	100	100	100
Dysentery, Amoebic	0	55	55	55
Vincent's angina (sent by dentists)	359	122	481	481
Weil-Felix reaction for Rickettsial diseases	11	53	64	64
Unclassified	–	–	698	2,180 [8]
Total			37,335	65,751

[1] Includes examinations for hemolytic streptococci and the organisms of Vincent's angina.

[2] Includes examinations for average number of leucocytes per field.

[3] Includes examinations for influenza bacilli and other organisms.

[4] Includes 112 partial reactions.

[5] Includes 128 agglutination tests for paratyphoid A and 3284 tests for Salmonella B and C groups.

[6] Includes examinations for Salmonella and dysentery bacilli.

[7] Includes examinations for agglutinins for typhoid and Salmonella bacilli.

[8] Includes miscellaneous examinations for identification of organisms.

Bacteriological Laboratory

Table XV—*Specimens and Examinations in 1945*

	Positive	Negative	Total Number of Specimens	Total Number of Examinations
Diphtheria:				
Diagnosis	114	4,649	4,763	10,784 [1]
Release	281	392	673	673
Gonorrhea				
Smear	1,148	8,243	9,391	18,782 [2]
Culture	65	1,559	1,624	3,149
Malaria	36	160	196	196
Meningococci, Spinal fluid for	11	18	29	47 [3]
Pneumonia:				
Pneumococci found and typed	403	–	377	403
Pneumococci not found	–	603	603	725
Tuberculosis:				
Sputum	586	4,184	4,770	4,770
Urine, Spinal fluid, etc. (Culture and animal inoculations)	60	885	945	945
Typhoid fever:				
Widal	19	1,578 [4]	1,597	4,208 [5]
Culture (blood, feces, uring, etc.)	104	8,308	8,412	11,702 [6]
Undulant fever	118	2,123	2,241	8,964 [7]
Miscellaneous:				
Diphtheria virulence tests	64	2	66	66
Dysentery agglutination tests	0	73	73	73
Dysentery, Amoebic	1	64	65	65
Vincent's Angina (sent by dentists)	582	269	851	851
Weil-Felix reaction for Rickettsial diseases	3	58	61	61
Unclassified	–	–	214	565 [8]
Total			36,951	67,029

[1] Includes examinations for hemolytic streptococci and the organisms of Vincent's angina.

[2] Includes examinations for average number of leucocytes per field.

[3] Includes examinations for influenza bacilli and other organisms.

[4] Includes 94 partial reactions.

[5] Includes 156 agglutination tests for paratyphoid A, 3, 194 agglutination tests for Salmonella B and C groups and 206 tests for heterophile antibody.

[6] Includes examinations for Salmonella and dysentery bacilli.

[7] Includes examinations for agglutinins for typhoid and Salmonella bacilli.

[8] Includes miscellaneous examinations for identification of organisms.

Bacteriological Laboratory

Table XV—*Specimens and Examinations in 1946*

	Positive	Negative	Total Number of Specimens	Total Number of Examinations
Blood Grouping and Rh Typing Tests	–	–	1,376	2,752
Diphtheria:				
Diagnosis	221	6,708	6,929	15,064 [1]
Release	411	706	1,117	1,117
Gonorrhea:				
Smears	1,086	9,648	10,734	21,468 [2]
Cultures	58	1,404	1,462	2,846
Malaria	227	498	725	725
Meningococci, Spinal fluid for	24	69	93	120 [3]
Pneumonia:				
Pneumococci found and typed	320	–	313	313
Pneumococci not found	–	678	678	1,114
Tuberculosis:				
Sputum	748	5,070	5,818	5,818
Cultures and animal inoculations	58	1,257	1,315	1,315
Typhoid fever:				
Widal	34	4,974 [4]	5,160	10,320 [5]
Culture (blood, feces, and urine)	182	8,821	9,003	13,139 [6]
Undulant Fever	217	3,062	3,279	3,955 [7]
Diphtheria Virulence Tests	57	8	65	65
Dysentery, Amoebic	3	203	206	206
Vincent's Angina (sent by Dentists)	395	320	715	715
Weil-Felix reaction for Rickettsial diseases	–	77	77	77
Unclassified	–	–	350	545 [8]
Total	4,041	43,503	49,415	81,674

[1] Includes examinations for hemolytic streptococci and the organisms of Vincent's Angina.
[2] Includes examinations for average number of leucocytes per field.
[3] Includes examinations for influenza bacilli and other organisms.
[4] Includes 152 partial reactions.
[5] Includes 5,160 tests for paratyphoid B.
[6] Includes examinations for Salmonella and dysentery bacilli.
[7] Includes 632 tests for heterophile antibodies and 44 tests for dysentery agglutination.
[8] Includes tests (miscellaneous) for identification of organisms.

Bacteriological Laboratory

Table XV—*Specimens and Examinations in 1947*

	Positive	Negative	Total Number of Specimens	Total Number of Examinations
Pre-natal Blood Typing Tests:				
Blood Grouping	–	–	7,785	7,785
Rh Typing	–	–		
Bank Blood Typing Tests:				
Blood Grouping	–	–	24,917	24,917
Ry Typing	–	–	24,917	28,521
Diphtheria:				
Diagnosis	329	7,850	8,179	17,664 [1]
Release	357	799	1,156	1,156
Gonorrhea — Smears	747	8,443	9,190	18,380 [2]
Malaria	69	380	449	449
Meningococci, Spinal fluid for	4	46	50	50 [3]
Pneumonia:				
Pneumococci found and typed	133	–	133	133
Pneumococci not found	–	547	547	547
Tuberculosis:				
Sputum	820	5,768	6,588	6,588
Urine, spinal fluid, etc. (culture and animal inoculations)	111	1,454	1,565	1,565
Typhoid Fever:				
Widal	8	5,708 [4]	5,716	11,432 [5]
Culture (blood, feces, and urine)	135	9,210	9,345	13,830 [6]
Undulant Fever	168	3,838	4,006	5,055 [7]
Diphtheria Virulence Tests	25	11	36	36
Dysentery, Amoebic	1	329	330	330
Vincent's Angina (sent by Dentists)	167	132	299	299
Weil-Felix reaction for Rickettsial diseases	–	103	103	103
Unclassified	–	–	389	1,371 [8]
Total	3,074	44,618	80,783	149,057

[1] Includes examinations for hemolytic streptococci and the organisms of Vincent's Angina.

[2] Includes examinations for average number of leucocytes per field.

[3] Includes examinations for influenza bacilli and other organisms.

[4] Includes 63 partial reactions.

[5] Includes 5,716 tests for paratyphoid B.

[6] Includes examinations for Salmonella and dysentery bacilli.

[7] Includes 1,049 tests for heterophile antibodies.

[8] Includes tests (miscellaneous) for identification of organisms.

Bacteriological Laboratory

Table XV—*Specimens and Examinations in 1948*

	Positive	Negative	Total Number of Specimens	Total Number of Examinations
Prenatal Blood Typing Tests:				
Blood Grouping	–	–	17,825	17,825
Rh Typing	–	–		19,000
Bank Blood Typing Tests:				
Blood Grouping	–	–	28,549	28,549
Rh Typing	–	–		30,411
Diphtheria:				
Diagnosis	203	6,691	6,984	15,886 [1]
Release	143	1,109	1,252	1,252
Gonorrhea — Smears	537	6,743	7,280	14,560 [2]
Malaria	9	245	254	254
Meningococci, Spinal fluid for	9	33	42	73 [3]
Pneumonia:				
Pneumococci found and typed	54	–	54	54
Pneumococci not found	–	241	241	241
Tuberculosis:				
Sputum — Smears	859	6,119	6,978	6,978
Urine, spinal fluid, etc. (Culture and animal inoculations)	221	1,626	1,847	1,847
Typhoid Fever:				
Widal	11	5,598 [4]	5,609	11,218 [5]
Culture	140	7,383	7,523	15,717 [6]
Undulant Fever	141	3,844	3,985	5,389 [7]
Diphtheria Virulence Tests	31	19	50	50
Viral Serological Tests:				
Influenza A and B	–	–	18	36
Mumps Complement Fixation Tests	–	–	180	180
Dysentery Amoebic	–	366	366	732 [8]
Vincent's Angina (sent by Dentists)	100	106	206	206
Weil-Felix reaction for Rickettsial diseases	–	107	107	107
Unclassified	–	–	326	540 [9]
Total	2,458	40,230	89,586	171,105

[1] Includes examinations for hemolytic streptococci and the organisms of Vincent's Angina.

[2] Includes examinations for average number of leucocytes per field.

[3] Includes examinations for influenza bacilli and other organisms.

[4] Includes 86 partial reactions.

[5] Includes 5,609 tests for paratyphoid B.

[6] Includes examinations for Salmonella and dysentery bacilli.

[7] Includes 1,404 tests for heterophile antibodies.

[8] Includes examinations for ova.

[9] Includes tests (miscellaneous) for identification of organisms.

Bacteriological Laboratory

Table XV—*Specimens and Examinations in 1949*

	Positive		Negative	Total Number of Specimens	Total Number of Examinations
Agglutinations:					
Typhoid	18		5,807		
Paratyphoid B	2		5,789		
Undulant Fever	156		4,086	5,825	18,114
Heterophile Antibodies	257		1,739		
Weil-Felix	1		134		
Additional Tests	–	124	–		
Blood Grouping and Rh Typing:					
Bank Blood Typing Tests				31,470	62,940
Prenatal				20,197	40,394
Enteric Pathogens:					
Typhoid	103		7,191		
Other Salmonellas	392		6,891	7,294	17,870
Flexner	55				
Sonne	23		3,213		
Amoebae	2		354		
Ova	4		365	371	725
Gonorrhea	440		5,631	6,071	12,164
Malaria:	8		153	161	161
*Throat Cultures:					
Diphtheria Diagnosis	150		6,698		
Diphtheria Release	106		1,938		
Diphtheria Virulence	23		13	8,891	19,355
Hemolytic Streptococci	1,065		2,809		
Vincent's Angina	72		6,156		
Others	–	325	–		
Tuberculosis:					
Microscopic Direct	929		5,957	7,214	7,214
Microscopic Concentrates	55		273	2,202	4,602
Isolations Reported on Direct Smear	106		2,168		
Isolations Reported on Culture	266		1,936		
Isolations Reported on Guinea Pig	51		75		
Vincent's Gingivitis	77		90	167	167
Virus Serology:					
Mumps	–		–	185	185
Influenza A, B, and FM_1	–		–	77	231
Lymphocytic Choriomeningitis	–		–	12	12
Lymphogranuloma and Psittacosis	–		–	8	8
Cold Agglutinins	–		–	18	18
Miscellaneous:					
Blood Cultures	–		–	64	109
Spinal Fluids	5		20	25	52
Others (urine, pus, etc.)	–		–	266	589
*Pneumonia	20		132	152	152
Total	4,386	449	69,618	90,670	185,062

TABLE XVI—*Salmonella Types Found During the Years 1940 Through 1949*

Type	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	Total	Percent
S. typhimurium	96	12	66	106	70	43	80	69	27	85	654	35.2
S. newport	4	1	18	31	48	16	367	19	26	5	535	28.8
S. oranienburg	4	6	9	7	14	8	9	89	13	7	166	8.9
S. montevideo	10	10	4	7	13	14	11	28	6	5	108	5.8
S. paratyphi B	11	20	1	4	7	6	7	7	4	3	70	3.8
S. anatum	2	5	2	2	2	43	–	4	–	1	61	3.3
S. tennessee	–	–	–	3	2	6	2	2	–	15	30	1.6
S. derby	–	2	5	4	8	2	1	5	1	–	28	1.5
S. bareilly	1	5	–	8	5	2	1	3	1	1	27	1.4
S. choleraesuis	5	5	2	5	3	1	–	1	1	–	23	1.2
S. enteritidis	–	–	–	8	–	–	4	6	1	4	23	1.2
S. panama	2	4	2	2	6	2	1	2	–	–	21	1.1
S. thompson	–	–	–	–	–	–	2	10	–	1	13	.7
S. newington	–	–	2	2	–	–	1	3	1	–	9	.5
S. senftenburg	–	2	6	–	–	–	1	–	–	1	10	.5
S. manhattan	–	1	–	1	1	–	1	3	–	1	8	.4
S. minnesota	–	–	–	–	–	1	6	1	–	–	8	.4
S. urbana	–	3	3	–	–	–	–	1	–	–	7	.4
S. litchfield	–	–	–	–	1	–	4	–	–	–	5	.3
S. meleagridis	–	–	–	–	5	–	–	–	1	–	6	.3
S. berta	–	–	–	–	–	–	–	3	–	–	3	.2
S. bredeney	–	–	–	1	–	–	1	2	–	–	4	.2
S. give	1	1	–	–	–	1	–	–	–	–	3	.2
S. muenchen	–	–	3	–	–	–	–	1	–	–	4	.2
S. oregon	–	–	–	–	–	1	–	–	1	2	4	.2
S. st. paul	–	–	–	–	–	–	3	–	–	–	3	.2
S. worthington	–	1	1	–	–	1	–	–	–	–	3	.2
S. chester	1	–	–	–	–	–	–	–	–	–	1	.1
S. hartford	–	–	–	–	–	–	–	1	–	–	1	.1
S. kentucky	–	–	–	1	–	–	–	–	1	–	2	.1
S. morbificans bovis	–	–	–	–	–	1	–	–	–	–	1	.1
S. paratyphi A	–	–	–	–	–	–	–	1	–	–	1	.1
S. poona	–	–	–	–	–	–	–	–	1	–	1	.1
S. san diego	–	–	–	–	1	–	–	–	–	1	2	.1
S. stanley	–	–	–	1	–	–	–	–	–	–	1	.1
Untyped	7	–	–	–	–	–	–	–	1	2	10	.5
Total	144	78	124	193	186	148	502	261	86	134	1856	100.0

Wassermann Laboratory

Table XVII—*Tests and Examinations*

Kind of Specimen	1940	1941	1942	1943	1944
Blood					
Number of Specimens	360,401	425,581	755,700	652,286	493,531
Tests					
Hinton	322,797	388,723	721,753	616,164	462,607
Rapid Hinton	–	628	12,451	11,073	6,986
Hinton Titr.—Penicillin	–	–	–	–	70
Kahn Titr.—Penicillin	–	–	–	–	70
Davies—Hinton Micro	4,662	4,620	5,605	6,006	6,743
G. C. Compl. Fixation	9,146	679	–	–	–
*Bacillus Abortus Agglutination	30,380	31,431	28,327	30,082	24,101
*Glanders	22	25	15	34	10
**Blood Grouping	–	–	–	–	–
**Rh Typing	–	–	–	–	–
**Hinton	–	–	–	–	–
Spinal Fluid					
Number of Specimens	11,784	10,934	10,139	9,790	10,018
Tests					
Wassermann	11,784	10,934	9,573	8,330	8,642
Davies-Hinton	6,154	8,774	10,139	9,790	10,018
Rabies Diagnosis*					
Number of Specimens	306	269	201	174	152
Tests					
Impressions	306	269	201	174	152
Sections	298	255	187	172	145
Animal Inoculations	240	232	176	166	145
Path. and Bact. Examinations*					
Number of Specimens	5	3	6	8	7
Tests					
Animal Inoculations	1	2	6	8	7
Cultures	4	2	6	6	2
Smears	2	1	3	5	6
Total Tests	385,796	446,575	788,442	682,010	519,704
Total Specimens	372,496	436,787	766,046	662,258	503,708

*Diagnostic Examinations for Division of Livestock Disease Control.
**Tests for State Blood Bank.

Wassermann Laboratory

Table XVII—*Tests and Examinations*

Kind of Specimen	1945	1946	1947	1948	1949
Blood					
Number of Specimens	519,296	541,108	524,765	517,683	519,668
Tests					
Hinton	485,864	486,954	457,747	446,727	438,820
Rapid Hinton	10,495	3,704	–	–	–
Hinton Titr.—Penicillin	2,950	12,033	9,086	9,820	13,247
Kahn Titr.—Penicillin	2,950	12,033	9,086	9,683	13,247
Davies—Hinton Micro	6,953	9,130	10,091	11,398	14,693
*Bacillus Abortus Agglutination	23,147	23,829	26,956	24,424	34,330
*Glanders	7	15	9	33	10
**Blood Grouping	375	4,156	–	–	–
**Rh Typing	375	4,156	–	–	–
**Hinton	346	8,608	20,876	25,281	28,568
Spinal Fluid					
Number of Specimens	11,022	12,409	13,908	12,732	13,068
Tests					
Wassermann	9,447	10,142	11,729	9,883	9,950
Davies-Hinton	11,022	12,409	13,908	12,732	13,068
Rabies Diagnosis*					
Number of Specimens	159	186	213	194	192
Tests					
Impressions	159	186	213	194	192
Sections	148	179	201	184	186
Animal Inoculations	143	177	191	184	172
Path. and Bact. Examinations*					
Number of Specimens	2	2	–	10	2
Tests					
Animal Inoculations	2	2	–	4	–
Cultures	–	–	–	5	1
Smears	2	1	–	3	–
Sections	–	–	–	5	–
Total Tests	554,385	587,714	560,093	550,560	542,915
Total Specimens	530,479	553,705	538,886	530,619	532,93 0

*Diagnostic Examinations for Division of Livestock Disease Control.
**Tests for State Blood Bank.

Wassermann Laboratory

Table XVIII—*Laboratory Examinations for Rabies*

Year	Positive		Negative	Total Animals Examined
	Dogs	Other Animals		
1940	52	4	244	309
1941	20	1	240	274
1942	18	1	171	202
1943	4	–	169	177
1944	1	–	145	152
1945	0	–	148	160
1946	1	–	178	185
1947	0	–	204	214
1948	0	–	184	193
1949	1	–	186	191

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New Bedford	8
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Newbury	240
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Norfolk	229
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North Andover	100
North Attleboro	75
North Brookfield	176
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Norwell	209
Norwood	57
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Orleans	245
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Peabody	42
Pelham	310
Pembroke	231
Pepperell	177
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Petersham	298
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Plainfield	339
Plainville	214
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Plympton	308
Princeton	284
Provincetown	162
Quincy	11
Randolph	88
Raynham	215
Reading	68
Rehoboth	173
Revere	30
Richmond	303
Rochester	276
Rockland	89
Rockport	145
Rowe	344
Rowley	246
Royalston	297
Russell	270
Rutland	248
Salem	26
Salisbury	191
Sandisfield	320
Sandwich	242
Saugus	52
Savoy	331
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Seekonk	131
Sharon	146
Sheffield	233
Shelburne	243
Sherborn	281
Shirley	203
Shrewsbury	80
Shutesbury	343
Somerset	107
Somerville	9
South Hadley	104
Southampton	266
Southboro	206
Southbridge	53
Southwick	223
Spencer	118
Springfield	4
Sterling	227
Stockbridge	235
Stoneham	69
Stoughton	85
Stow	257
Sturbridge	207
Sudbury	213
Sunderland	283
Sutton	197
Swampscott	73
Swansea	124
Taunton	28
Templeton	144
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Tewksbury State Infirmary	353
Tisbury	237
Tolland	349
Topsfield	274
Townsend	201
Truro	306
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Upton	202
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Walpole	87
Waltham	22
Ware	109
Wareham	99
Warren	165
Warwick	317
Washington	335
Watertown	29
Wayland	150
Webster	67
Wellesley	51
Wellfleet	294
Wendell	326
Wenham	250
West Boylston	189
West Bridgewater	158
West Brookfield	252
West Newbury	253
West Springfield	45
West Stockbridge	280
West Tisbury	336
Westborough	116
Westfield	46
Westford	159
Westhampton	314
Westminster	221
Weston	137
Westport	136
Westwood	126
Weymouth	31
Whately	287
Whitman	95
Wilbraham	169
Williamsburg	230
Williamstown	138
Wilmington	123
Winchendon	122
Winchester	62
Windsor	332
Winthrop	48
Woburn	50
Worcester	3
Worthington	322
Wrentham	133
Yarmouth	198

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities*

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	CHICKEN POX															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
1	Massachusetts	4,660,546	14,167	4	11,538	7	19,489	5	10,401	2	11,912	3	18,793	6	18,118	1	22,132	5
2	Boston	766,386	4,053	2	2,112	–	3,482	2	1,550	–	2,355	–	3,256	–	2,792	–	3,177	1
3	Worcester	203,171	761	–	706	–	1,410	–	583	–	956	–	1,672	–	1,013	–	1,068	–
4	Springfield	168,955	550	–	334	–	532	1	334	–	331	–	448	–	559	–	613	1
5	Fall River	115,062	256	–	218	–	292	–	145	–	482	1	450	–	265	–	294	–
6	Cambridge	111,305	791	–	605	–	1,062	–	707	1	353	–	964	–	1,129	–	854	–
7	Lynn	111,305	434	–	482	–	361	–	189	–	224	–	711	–	822	–	686	–
8	New Bedford	110,308	90	1	185	–	189	–	88	1	242	–	227	–	239	–	656	–
9	Somerville	109,135	160	–	80	–	153	–	95	–	147	–	136	–	203	–	117	–
10	Lowell	101,229	48	–	38	1	122	–	27	–	98	–	83	–	103	–	172	–
11	Quincy	87,584	136	–	369	–	1,322	–	105	–	208	–	734	–	664	–	674	1
12	Lawrence	86,714	84	–	41	1	52	–	44	–	51	–	118	–	88	–	142	–
13	Newton	83,715	474	–	428	–	582	–	417	–	347	–	517	–	133	1	582	–
14	Medford	70,548	223	–	85	–	150	–	111	–	106	–	221	–	126	–	141	–
15	Brockton	67,706	148	–	211	–	118	–	84	–	53	–	211	1	326	–	380	–
16	Brookline	63,221	197	1	70	–	287	–	139	–	184	–	392	–	206	–	366	–
17	Malden	60,922	328	–	157	–	598	–	63	–	101	–	406	–	303	–	454	–
18	Pittsfield	56,931	65	–	172	–	164	–	177	–	215	–	201	–	342	–	104	–
19	Holyoke	53,775	45	–	89	–	71	–	38	–	13	–	89	–	87	–	49	–
20	Everett	50,088	62	–	54	–	39	–	30	–	67	–	109	–	49	–	55	–
21	Chicopee	47,219	75	–	21	–	67	–	84	–	10	–	57	–	85	–	40	–
22	Waltham	46,693	122	–	69	–	180	–	109	–	178	–	97	–	100	–	238	–
23	Arlington	46,541	293	–	150	2	202	–	175	–	132	–	283	–	135	–	481	–
24	Haverhill	46,162	168	–	116	–	174	–	41	–	145	–	185	1	81	–	247	–
25	Fitchburg	45,447	19	–	34	–	13	–	18	–	6	–	15	–	53	–	60	–
26	Salem	44,232	56	–	29	–	108	–	49	–	71	–	43	–	77	–	39	–
27	Chelsea	39,940	81	–	65	–	136	–	31	–	20	–	130	1	40	–	71	–
28	Taunton	39,661	4	–	–	–	1	–	44	–	3	–	15	–	21	–	21	–
29	Watertown	39,199	144	–	99	–	175	–	148	–	59	–	101	–	196	–	198	–
30	Revere	36,805	4	–	27	–	35	–	6	–	5	–	12	–	40	–	2	–
31	Weymouth	31,556	12	–	9	–	8	–	1	–	13	–	26	–	20	–	14	–
32	Belmont	30,627	201	–	315	–	331	–	257	–	257	–	295	–	409	–	178	–
33	Melrose	30,274	86	–	22	–	122	–	86	–	93	–	244	–	292	–	146	–
34	Beverly	27,925	49	–	21	–	29	–	14	–	16	–	36	–	13	–	29	–
35	Framingham	27,489	182	–	216	–	247	–	197	–	106	–	150	–	211	–	321	–
36	Gloucester	25,562	11	–	23	–	14	–	29	–	11	–	13	–	1	–	17	–
37	Northampton	25,129	79	–	162	–	202	–	69	–	309	–	65	–	225	–	159	1
38	Leominster	24,697	52	–	17	–	26	–	25	–	37	1	37	–	69	–	44	–
39	Milton	24,366	182	–	189	–	98	–	16	–	204	–	203	–	68	–	170	–

40	Methuen	24,271	58	–	34	–	44	–	16	–	45	–	205	–	75	–	135	–
41	Braintree	23,675	45	–	76	–	260	–	47	–	29	–	294	–	66	–	303	–
42	Peabody	22,797	13	–	5	–	70	–	36	–	3	–	20	–	18	–	28	–
43	Attleboro	22,621	26	–	52	–	376	–	33	–	71	–	179	–	58	–	199	–
44	North Adams	22,230	17	–	10	–	17	–	11	–	39	1	18	–	66	–	134	–
45	West Springfield	21,500	46	–	21	–	193	–	40	–	49	–	94	–	131	–	385	–
46	Westfield	20,963	9	–	18	–	42	–	8	–	4	–	44	–	56	–	9	–
47	Wakefield	20,845	15	–	90	–	46	–	13	–	35	–	15	–	32	–	73	–
48	Winthrop	20,422	226	–	64	1	571	–	49	–	90	–	274	–	95	–	229	–
49	Gardner	20,300	39	–	14	–	16	–	1	–	37	–	20	–	6	–	38	–
50	Woburn	19,976	44	–	17	–	12	–	7	–	2	–	15	–	5	–	16	–
51	Wellesley	19,720	153	–	44	–	245	–	414	–	75	–	189	–	65	–	862	–
52	Saugus	18,267	6	–	8	–	66	–	17	–	49	–	23	–	24	–	87	–
53	Southbridge	18,217	7	–	28	1	47	–	24	–	33	–	47	–	63	–	58	–
54	Greenfield	18,182	44	–	3	–	21	–	136	–	13	–	80	–	252	–	51	–
55	Dedham	17,644	8	–	19	–	46	–	36	–	19	–	27	–	13	–	23	–
56	Natick	17,505	105	–	112	–	246	–	85	–	216	–	390	–	216	–	249	–
57	Norwood	17,493	18	–	2	–	5	–	6	–	3	–	6	–	6	–	5	–
58	Needham	16,307	199	–	293	–	63	–	147	–	209	–	43	–	648	–	283	–
59	Milford	16,147	8	–	22	–	67	–	25	–	37	–	95	–	49	–	122	–
60	Marlborough	16,132	16	–	48	–	4	–	39	–	14	–	62	–	28	–	27	–
61	Lexington	15,536	20	–	21	–	72	–	93	–	25	–	117	–	62	–	86	–
62	Winchester	15,481	90	–	216	–	73	–	32	–	57	–	77	–	218	–	63	–
63	Danvers	15,025	6	–	3	–	27	–	2	–	4	–	38	–	11	–	13	–
64	Newburyport	14,223	12	–	48	–	67	–	89	–	36	–	81	–	10	–	139	–
65	Marblehead	13,964	20	–	67	–	145	–	12	–	54	–	53	–	298	–	117	–
66	Plymouth	13,943	17	–	22	–	21	–	21	–	12	–	23	–	14	–	76	–
67	Webster	13,826	1	–	5	–	84	1	43	–	19	–	2	–	109	–	13	–
68	Reading	13,637	45	–	11	–	19	–	14	–	23	–	68	–	8	–	94	–
69	Stoneham	13,116	52	–	17	–	22	–	25	–	62	–	23	–	71	–	227	–
70	Fairhaven	13,072	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
71	Clinton	12,991	8	–	2	–	34	–	11	–	1	–	12	–	32	–	9	–
72	Adams	12,821	5	–	9	–	4	–	–	–	41	–	–	–	5	–	7	–
73	Swampscott	12,781	115	–	85	–	130	–	45	–	7	–	200	–	59	–	186	–
74	Andover	12,620	20	–	26	–	177	–	11	–	80	–	90	–	15	–	108	–
75	North Attleboro	12,601	1	–	–	–	7	–	40	–	19	–	28	–	34	–	27	–
76	Athol	12,351	15	–	13	–	5	–	3	–	1	–	7	–	65	–	26	–
77	Hingham	11,132	24	–	38	–	11	–	13	–	126	–	93	–	150	–	41	–
78	Easthampton	10,830	4	–	11	–	30	–	4	–	–	–	10	1	27	–	16	–
79	Amesbury	10,824	84	–	70	–	14	–	2	–	37	–	64	–	40	–	16	–
80	Shrewsbury	10,791	1	–	13	–	6	–	76	–	6	–	17	–	23	–	10	–
81	Dartmouth	10,712	12	–	18	–	76	–	72	–	13	–	46	–	82	–	142	–
82	Northbridge	10,212	1	–	–	–	2	–	2	–	9	–	12	–	4	–	28	–
83	Palmer	10,211	12	–	9	–	18	–	37	–	12	–	6	–	63	–	65	–
84	Middleborough	10,099	63	–	166	–	60	–	8	–	17	–	12	–	8	–	–	–
85	Stoughton	9,470	4	–	12	–	16	–	3	–	10	–	26	–	5	–	13	–
86	Chelmsford	9,268	7	–	4	–	20	–	1	–	6	–	2	–	1	–	14	–
87	Walpole	9,258	2	–	44	–	10	–	5	–	31	–	12	–	20	–	18	–
88	Randolph	9,210	–	–	–	–	1	–	4	–	2	–	1	–	–	–	7	–
89	Rockland	9,053	–	–	1	–	5	–	–	–	1	–	19	–	112	–	9	–
90	Billerica	9,001	3	–	9	–	7	–	1	–	9	–	6	–	3	–	3	–
91	Auburn	8,958	94	–	26	–	49	–	38	–	85	–	114	–	27	–	116	–
92	Barnstable	8,943	21	–	12	–	26	–	5	–	17	–	15	–	37	–	50	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	CHICKEN POX															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
93	Agawam	8,915	14	–	13	–	39	–	96	–	8	–	13	–	106	–	40	–
94	Concord	8,743	1	–	4	–	105	–	56	–	70	–	63	–	25	–	5	–
95	Whitman	8,740	–	–	11	–	10	–	2	–	14	–	2	–	2	–	1	–
96	Bridgewater	8,641	45	–	5	–	75	–	5	–	2	–	15	–	44	–	61	–
97	Falmouth	8,489	18	–	63	–	14	–	36	–	33	–	7	–	35	–	25	–
98	Grafton	8,425	12	–	3	–	–	–	8	–	–	–	1	–	49	–	9	–
99	Wareham	8,392	1	–	4	–	–	–	–	–	2	–	6	–	5	–	13	–
100	North Andover	8,286	49	–	7	–	86	–	22	–	18	–	93	–	23	–	54	–
101	Millbury	8,268	57	–	26	–	104	–	36	–	105	–	159	–	65	–	33	–
102	Hudson	8,171	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
103	Ludlow	8,065	38	–	4	–	106	–	65	–	15	–	21	–	267	–	160	–
104	South Hadley	7,809	1	–	6	–	6	–	–	–	–	–	5	–	10	–	34	–
105	Franklin	7,735	6	–	65	–	2	–	7	–	23	–	5	–	6	–	20	–
106	Amherst	7,696	74	–	8	–	12	–	21	–	9	–	50	–	5	–	65	–
107	Somerset	7,668	8	–	11	–	10	–	–	–	–	–	1	1	1	–	1	–
108	Montague	7,602	2	–	2	–	11	–	6	–	3	–	8	–	31	–	2	–
109	Ware	7,578	13	–	4	–	5	–	84	–	2	–	–	–	26	–	–	–
110	Dracut	7,524	4	–	8	–	8	–	11	–	19	–	10	–	20	–	3	–
111	Mansfield	7,380	1	–	5	–	38	1	26	–	8	–	43	–	58	–	12	–
112	Maynard	7,198	3	–	7	–	4	–	27	–	2	–	1	–	2	–	11	–
113	Canton	7,010	11	–	10	–	7	–	11	–	3	–	4	–	–	–	14	–
114	Abington	6,963	3	–	28	–	67	–	–	–	17	–	7	–	13	–	10	–
115	Longmeadow	6,957	9	–	55	–	75	–	16	–	–	–	50	–	8	–	75	–
116	Westborough	6,866	2	–	1	–	52	–	4	–	–	–	11	–	193	–	4	–
117	Ipswich	6,857	40	–	28	–	19	–	8	–	4	–	97	–	8	–	4	–
118	Spencer	6,856	12	–	13	–	58	–	8	–	8	–	68	–	17	–	92	–
119	Uxbridge	6,836	53	–	12	–	7	–	27	–	12	–	5	–	21	–	106	–
120	Foxborough	6,627	6	–	20	–	10	–	1	–	5	–	8	–	58	–	20	–
121	Great Barrington	6,581	8	–	–	–	108	–	63	–	1	–	42	–	46	–	47	–
122	Winchendon	6,461	22	–	52	–	17	–	1	–	16	–	64	–	43	–	25	–
123	Wilmington	6,377	5	–	–	–	–	–	–	–	1	–	–	–	7	–	3	–
124	Swansea	6,319	26	–	12	–	9	–	–	–	–	–	1	–	3	–	63	–
125	Easton	6,223	4	–	9	–	21	–	7	–	–	–	1	–	29	–	117	–
126	Westwood	6,053	–	–	1	–	1	–	13	–	13	–	1	–	20	–	5	–
127	Tewskbury	5,949	12	–	1	–	8	–	2	–	35	–	5	–	8	–	–	–
128	Orange	5,907	9	–	10	–	4	–	5	–	11	–	12	–	3	–	27	1
129	Monson	5,713	26	–	12	–	22	–	6	–	–	–	4	–	19	–	19	–
130	Holden	5,648	40	–	36	–	14	–	47	–	109	–	35	–	34	–	105	–
131	Seekonk	5,552	–	–	–	–	1	–	3	–	–	–	1	–	3	–	4	–

132	Scituate	5,526	3	–	7	–	10	–	5	–	9	–	11	–	17	–	25	–					
133	Wrentham	5,437	45	–	16	–	19	–	49	–	6	–	23	–	26	–	98	–					
134	Leicester	5,409	–	–	–	1	1	–	–	–	–	–	1	–	2	–	1	–					
135	Oxford	5,368	7	–	62	–	24	–	24	–	7	–	13	–	44	–	24	–					
136	Westport	5,297	4	–	5	–	2	–	2	–	18	–	13	–	57	–	16	–					
137	Weston	5,241	15	–	30	–	155	–	28	–	24	–	6	–	34	–	85	–					
138	Williamstown	4,919	15	–	2	–	7	–	27	–	13	–	9	–	2	–	32	–					
139	Dudley	4,816	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–					
140	Dalton	4,517	2	–	–	–	1	–	–	–	6	–	10	–	9	–	3	–					
141	Bedford	4,486	–	–	10	–	48	–	7	–	–	–	1	–	3	–	59	–					
142	Lee	4,444	8	–	3	–	27	–	40	–	18	–	78	1	7	–	3	–					
143	Hull	4,437	11	–	–	–	8	–	3	–	6	–	22	–	40	–	5	–					
144	Templeton	4,435	–	–	–	–	3	–	–	–	7	–	2	–	1	–	31	–					
145	Rockport	4,403	2	–	–	–	2	–	7	–	1	–	3	–	24	–	22	–					
146	Sharon	4,379	8	–	9	–	25	–	1	–	26	–	21	–	18	–	71	–					
147	Acushnet	4,370	–	–	4	–	–	–	–	–	–	–	1	–	–	–	–	–					
148	Blackstone	4,349	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–					
149	Ayer	4,328	6	–	20	–	20	–	6	–	13	–	7	–	75	–	162	–					
150	Wayland	4,262	1	–	–	–	1	–	6	–	2	–	4	–	–	–	2	–					
151	Medfield	4,199	–	–	3	–	4	–	2	–	1	–	2	–	2	–	73	–					
152	East Longmeadow	4,163	3	–	1	–	–	–	28	–	1	–	27	–	2	–	78	–					
153	East Bridgewater	4,158	68	–	35	–	55	–	8	–	46	–	68	–	29	–	64	–					
154	Holbrook	4,056	2	–	32	–	3	–	12	–	32	–	6	–	2	–	24	–					
155	Belchertown	4,021	17	–	8	–	3	–	15	–	10	–	19	–	49	–	29	–					
156	Cohasset	3,947	–	–	2	–	1	–	3	–	5	–	68	–	28	–	11	–					
157	Bellingham	3,935	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–					
158	West Bridgewater	3,905	41	–	40	–	24	–	3	–	20	–	30	–	10	–	13	–					
159	Westford	3,815	6	–	3	–	13	–	48	–	76	–	29	–	1	–	22	–					
160	Bourne	3,716	1	–	–	–	24	–	23	–	1	–	8	–	20	–	16	–					
161	Holliston	3,582	9	–	1	–	–	–	7	–	4	–	8	–	6	–	23	–					
162	Provincetown	3,564	30	–	1	–	5	–	19	–	5	–	–	–	16	–	4	–					
163	Hopedale	3,518	4	–	2	–	2	–	–	–	3	–	2	–	–	–	1	–					
164	Charlton	3,507	–	–	–	–	–	–	–	–	–	–	1	–	5	–	–	–					
165	Warren	3,498	14	–	40	–	6	–	5	–	2	–	50	–	22	–	35	–					
166	Barre	3,485	13	–	22	–	2	–	7	–	21	–	13	–	40	–	85	–					
167	Lynnfield	3,476	35	–	3	–	5	–	5	–	22	–	–	–	101	–	9	–					
168	Northboro	3,450	–	–	–	–	–	–	–	–	–	–	1	–	5	–	2	–					
169	Wilbraham	3,442	8	–	3	–	2	–	30	–	26	–	95	–	13	–	34	–					
170	Deerfield	3,422	17	–	27	–	6	–	1	–	–	–	–	–	8	–	1	–					
171	Medway	3,397	–	–	–	–	2	–	–	–	3	–	–	–	9	–	55	–					
172	Ashland	3,326	5	–	36	–	77	–	5	–	1	–	–	–	–	–	–	–					
173	Rehoboth	3,282	–	–	–	–	–	–	–	–	–	–	5	–	–	–	3	–					
174	North Reading	3,270	6	–	–	–	–	–	–	–	4	–	11	–	1	–	9	–					
175	Hanover	3,168	5	–	44	–	–	–	–	–	1	–	20	–	1	–	8	–					
176	North Brookfield	3,121	24	–	3	–	3	–	33	–	9	–	4	–	5	–	1	–					
177	Pepperell	3,119	–	–	–	–	12	–	1	–	–	–	8	–	5	–	1	–					
178	Groton	3,106	2	–	3	–	15	–	–	–	2	–	–	–	3	–	7	–					
179	Norton	3,096	3	–	5	–	12	–	–	–	–	–	–	–	1	–	–	–					
180	Lancaster	3,092	19	–	3	–	58	–	19	–	30	–	31	–	8	–	8	–					
181	Dighton	3,070	–	–	–	–	–	–	2	–	–	–	1	–	–	–	–	–					
182	Lunenburg	3,058	7	–	2	–	–	–	1	–	–	–	13	–	1	–	41	–					
183	Kingston	3,018	–	–	2	–	–	–	1	–	4	–	6	–	1	–	3	–					

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	CHICKEN POX															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
184	Burlington	3,017	9	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
185	Acton	3,004	–	–	6	–	10	–	20	–	12	–	4	–	42	–	1	–
186	Lenox	3,000	1	–	–	–	3	–	2	–	3	–	2	–	5	–	1	–
187	Hopkinton	2,991	3	–	16	–	12	–	40	–	–	–	10	–	19	–	101	–
188	Nahant	2,890	2	–	3	–	4	–	11	–	–	–	13	–	–	–	1	–
189	West Boylston	2,874	2	–	11	–	2	–	–	–	72	–	26	–	58	–	2	–
190	Nantucket	2,870	–	–	–	–	1	–	–	–	1	–	2	–	–	–	–	–
191	Salisbury	2,828	6	–	7	–	2	–	34	–	2	–	4	–	18	–	1	–
192	Douglas	2,722	16	–	–	–	18	–	–	–	–	–	15	–	18	–	1	–
193	Avon	2,703	–	–	39	–	11	–	1	–	8	–	28	–	–	–	17	–
194	Hamilton	2,696	3	–	3	–	4	–	9	–	–	–	6	–	25	–	8	–
195	Hanson	2,695	–	–	15	–	1	–	7	–	8	–	18	–	3	–	11	–
196	Hadley	2,656	–	–	4	–	–	–	–	–	–	–	–	–	–	–	–	–
197	Sutton	2,610	1	–	3	–	28	–	–	–	46	–	22	–	4	–	6	–
198	Yarmouth	2,608	–	–	1	–	4	–	11	–	2	–	–	–	7	–	25	–
199	Manchester	2,580	–	–	1	–	–	–	7	–	43	–	5	–	24	–	49	–
200	Duxbury	2,486	6	–	–	–	38	–	22	–	27	–	9	–	14	–	–	–
201	Townsend	2,479	7	–	–	–	20	–	15	–	–	–	1	–	1	–	155	–
202	Upton	2,479	13	–	8	–	9	–	2	–	2	–	8	–	16	–	4	–
203	Shirley	2,459	4	–	2	–	2	–	3	–	–	–	–	–	–	–	18	–
204	Middleton	2,456	–	–	–	–	–	–	4	–	–	–	2	–	3	–	1	–
205	Merrimac	2,425	10	–	5	–	22	–	2	–	31	–	16	–	22	–	18	–
206	Southboro	2,421	3	–	29	–	7	–	63	–	1	–	26	–	2	–	5	–
207	Sturbridge	2,420	4	–	9	–	2	–	16	–	–	–	6	–	7	–	51	–
208	Marshfield	2,405	–	–	–	–	–	–	2	–	–	–	–	–	–	–	2	–
209	Norwell	2,393	–	–	1	–	1	–	–	–	5	–	–	–	–	–	34	–
210	Ashburnham	2,380	–	–	5	–	6	–	18	–	2	–	1	–	1	–	31	–
211	Millis	2,363	3	–	–	–	2	–	8	–	2	–	–	–	–	–	1	–
212	Mattapoisett	2,347	7	–	3	–	5	–	49	–	9	–	51	–	69	–	5	–
213	Sudbury	2,322	–	–	6	–	–	–	5	–	1	–	51	–	–	–	39	–
214	Plainville	2,278	–	–	–	–	–	–	–	–	–	–	–	–	28	–	2	–
215	Raynham	2,263	–	–	–	–	23	–	–	–	–	–	–	–	–	–	1	–
216	Chatham	2,241	–	–	–	–	8	–	23	–	–	–	1	–	1	–	70	–
217	Marion	2,216	13	–	31	–	114	–	1	–	6	–	21	–	4	–	7	–
218	Hatfield	2,188	1	–	8	–	23	–	12	–	27	–	1	–	–	–	1	–
219	Lincoln	2,179	4	–	–	–	–	–	2	–	8	–	–	–	–	–	–	–
220	Northfield	2,162	38	–	2	–	2	–	1	–	1	–	62	–	14	–	34	–
221	Westminster	2,153	–	–	1	–	10	–	12	–	–	–	28	–	–	–	2	–
222	Groveland	2,150	15	–	–	–	53	–	10	–	8	–	21	–	8	–	6	–

223	Southwick	2,141	5	–	1	–	1	–	–	–	–	–	8	–	9	–	–	–
224	Georgetown	2,122	1	–	–	–	2	–	9	–	–	–	4	–	7	–	–	–
225	Hardwick	2,115	30	–	1	–	4	–	16	–	11	–	3	–	12	–	14	–
226	Harwich	2,071	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
227	Sterling	2,043	2	–	3	–	8	–	35	–	3	–	4	–	2	–	41	–
228	Freetown	2,027	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–
229	Norfolk	2,006	1	–	5	–	13	–	5	–	–	–	–	–	5	–	3	–
230	Williamsburg	1,980	–	–	4	–	–	–	–	–	39	–	–	–	103	–	–	–
231	Pembroke	1,917	–	–	–	–	3	–	–	–	38	–	–	–	2	–	5	–
232	Dennis	1,807	4	–	–	–	3	–	3	–	–	–	–	–	3	–	4	–
233	Sheffield	1,801	3	–	69	–	46	–	9	–	4	–	13	–	30	–	98	–
234	Lanesborough	1,754	–	–	–	–	18	–	17	–	3	–	–	–	–	–	11	–
235	Stockbridge	1,739	1	–	1	–	–	–	–	–	–	–	1	–	–	–	–	–
236	Dover	1,736	18	–	13	–	–	–	6	–	1	–	4	–	3	–	66	–
237	Tisbury	1,719	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
238	Cheshire	1,718	–	–	–	–	–	–	–	–	32	–	–	–	–	–	–	–
239	Essex	1,705	5	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–
240	Newbury	1,677	–	–	–	–	–	–	–	–	–	–	7	–	–	–	30	–
241	Littleton	1,673	3	–	3	–	2	–	73	–	7	–	9	–	4	–	43	–
242	Sandwich	1,671	4	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
243	Shelburne	1,656	–	–	–	–	–	–	–	–	5	–	10	–	–	–	–	–
244	Mendon	1,650	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
245	Orleans	1,642	1	–	–	–	42	–	22	–	–	–	16	–	–	–	6	–
246	Rowley	1,626	1	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
247	Millville	1,616	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
248	Rutland	1,561	18	–	–	–	–	–	–	–	–	–	–	–	15	–	1	–
249	Lakeville	1,555	24	–	13	–	1	–	–	–	–	–	4	–	1	–	46	–
250	Wenham	1,550	11	–	4	–	–	–	12	–	2	–	9	–	30	–	29	–
251	Buckland	1,525	1	–	–	–	–	–	5	–	–	–	–	–	–	–	–	–
252	West Brookfield	1,512	7	–	5	–	51	–	23	–	–	–	4	–	9	–	2	–
253	West Newbury	1,503	7	–	–	–	1	–	–	–	–	–	1	–	–	–	1	–
254	Tyngsborough	1,495	–	–	–	–	–	–	28	–	–	–	7	–	10	–	3	–
255	Colrain	1,455	5	–	–	–	2	–	44	–	13	–	1	–	29	–	3	–
256	Clarksburg	1,450	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
257	Stow	1,427	1	–	2	–	–	–	–	–	47	–	6	–	25	–	15	–
258	Brookfield	1,390	45	–	–	–	2	–	34	–	2	–	4	–	16	–	28	–
259	Carver	1,383	–	–	–	–	1	–	–	–	1	–	–	–	–	–	19	–
260	Oak Bluffs	1,345	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
261	Hinsdale	1,325	–	–	–	–	1	–	–	–	–	–	3	–	1	–	–	–
262	Erving	1,315	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
263	Boylston	1,313	–	–	–	–	1	–	7	–	–	–	7	–	27	–	14	–
264	Edgartown	1,296	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
265	Hampden	1,256	–	–	3	–	–	–	–	–	–	–	8	–	–	–	1	–
266	Southampton	1,254	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
267	Chester	1,252	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
268	Huntington	1,242	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
269	Berkley	1,231	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
270	Russell	1,221	1	–	–	–	–	–	–	–	–	–	–	–	–	–	48	–
271	Granby	1,193	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
272	Berlin	1,174	–	–	61	–	12	–	–	–	4	–	1	–	4	–	22	–
273	Ashby	1,155	1	–	–	–	–	–	–	–	–	–	–	–	–	–	36	–
274	Topsfield	1,153	1	–	1	–	30	–	1	–	7	–	–	–	14	–	68	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	CITIES AND TOWNS IN ORDER OF POPULATION	Population Estimated as of July 1, 1949	CHICKEN POX															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
275	East Brookfield	1,125	2	–	–	–	2	–	3	–	9	–	1	–	5	–	–	–
276	Rochester	1,107	–	–	–	–	–	–	–	–	–	–	–	–	2	–	9	–
277	Halifax	1,093	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
278	Bernardston	1,070	2	–	–	–	–	–	14	–	6	–	3	–	1	–	–	–
279	Harvard	1,065	–	–	–	–	–	–	2	–	12	–	20	–	–	–	–	–
280	West Stockbridge	1,059	–	–	–	–	–	–	11	–	7	–	9	–	1	–	–	–
281	Sherborn	1,036	–	–	1	–	7	–	–	–	–	–	–	–	–	–	–	–
282	Hubbardston	1,019	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
283	Sunderland	1,018	–	–	4	–	1	–	–	–	–	–	–	–	–	–	–	–
284	Princeton	1,012	–	–	2	–	2	–	13	–	46	–	–	–	6	–	14	–
285	Ashfield	981	6	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–
286	Brimfield	975	–	–	–	–	–	–	–	–	–	–	1	–	2	–	1	–
287	Whately	973	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–
288	Gill	918	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–
289	Bolton	905	25	–	1	–	–	–	–	–	1	–	3	–	–	–	–	–
290	Paxton	905	–	–	–	–	24	–	–	–	4	–	6	–	3	–	5	–
291	New Marlboro	896	1	–	1	–	–	–	1	–	75	–	12	–	–	–	3	–
292	Conway	867	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
293	Boxford	852	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5	–
294	Wellfleet	851	–	–	–	–	–	–	23	–	–	–	–	–	3	–	–	–
295	Charlemont	812	–	–	4	–	–	–	–	–	–	–	–	–	–	–	–	–
296	Brewster	757	–	–	–	–	–	–	–	–	–	–	1	–	3	–	–	–
297	Royalston	750	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
298	Petersham	743	2	–	–	–	1	–	–	–	–	–	8	–	1	–	–	–
299	Carlisle	697	–	–	–	–	–	–	–	–	23	–	1	–	–	–	–	–
300	Becket	682	–	–	1	–	–	–	–	–	–	–	2	–	–	–	–	–
301	Egremont	660	1	–	10	–	2	–	22	–	–	–	4	–	3	–	4	–
302	Granville	656	10	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
303	Richmond	646	18	–	–	–	–	–	–	–	–	–	–	–	18	–	–	–
304	Eastham	604	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
305	Leverett	594	–	–	–	–	–	–	8	–	–	–	–	–	–	–	–	–
306	Truro	582	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
307	Blandford	572	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
308	Plympton	545	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
309	Cummington	532	–	–	9	–	–	–	–	–	–	–	34	–	–	–	5	–
310	Pelham	512	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
311	Phillipston	475	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
312	Dunstable	440	–	–	4	–	8	–	–	–	–	–	–	–	2	–	–	–
313	Oakham	424	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

314	Westhampton	413	-	-	-	-	-	-	2	-	-	-	-	-	-	-	2	-
315	New Braintree	409	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
316	Florida	401	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
317	Warwick	401	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-
318	Otis	377	-	-	1	-	1	-	6	-	-	-	-	-	1	-	-	-
319	Chesterfield	375	-	-	8	-	-	-	8	-	6	-	8	-	16	-	2	-
320	Sandisfield	370	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
321	New Salem	364	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
322	Worthington	363	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
323	Boxborough	358	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-
324	Wales	354	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
325	Hancock	349	-	-	-	-	-	-	-	-	-	-	28	-	-	-	-	-
326	Wendell	348	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-
327	Mashpee	343	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
328	Goshen	328	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
329	Heath	327	3	-	6	-	-	-	4	-	-	-	7	-	28	-	-	-
330	Monterey	305	-	-	-	-	1	-	3	-	-	-	1	-	-	-	-	-
331	Savoy	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
332	Windsor	274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
333	Holland	265	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
334	Leyden	254	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
335	Washington	242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
336	West Tisbury	239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
337	C hilmark	230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
338	Middlefield	226	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
339	Plainfield	224	-	-	-	-	13	-	-	-	4	-	-	-	-	-	-	-
340	Tyringham	211	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
341	Alford	207	-	-	-	-	-	-	12	-	-	-	-	-	3	-	-	-
342	Hawley	203	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
343	Shutesbury	201	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
344	Rowe	178	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
345	Monroe	171	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
346	Montgomery	137	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
347	Peru	116	-	-	-	-	-	-	-	-	13	-	-	-	-	-	-	-
348	Gay Head	114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
349	Tolland	111	-	-	-	-	-	-	10	-	-	-	-	-	-	-	-	-
350	Gosnold	107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
351	New Ashford	99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
352	Mt. Washington	53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
353	Tewksbury State Hospital		1	-	-	-	-	-	31	-	-	-	2	-	-	-	-	-
354	Military Establishments		20	-	55	-	60	-	25	-	2	-	-	-	-	-	-	-

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities*

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	DIPHTHERIA															
			1942		1943		944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
1	Massachusetts	4,660,546	154	7	140	11	229	10	194	10	439	36	433	12	290	27	333	44
2	Boston	766,386	16	1	36	2	50	2	46	2	156	10	186	4	133	14	213	32
3	Worcester	203,171	2	–	–	–	4	1	6	–	7	2	2	–	–	–	–	–
4	Springfield	168,955	9	–	–	–	–	–	4	1	1	–	4	–	3	–	–	–
5	Fall River	115,062	50	2	7	–	3	–	–	–	–	–	1	–	–	–	1	–
6	Cambridge	111,305	3	1	3	1	4	1	3	–	9	1	10	–	6	–	10	–
7	Lynn	111,305	–	–	–	–	–	–	3	–	6	–	8	1	–	–	4	–
8	New Bedford	110,308	1	–	6	1	13	1	16	3	13	–	16	–	1	–	3	–
9	Somerville	109,135	8	–	18	4	47	–	21	–	92	7	20	–	8	2	13	1
10	Lowell	101,229	18	1	11	–	8	–	11	–	14	2	7	–	4	–	–	–
11	Quincy	87,584	–	–	–	–	2	–	1	–	–	–	–	–	1	–	2	–
12	Lawrence	86,714	–	–	–	–	35	2	3	–	–	–	–	–	1	–	–	–
13	Newton	83,715	1	–	–	–	–	–	1	1	1	–	1	–	–	–	2	–
14	Medford	70,548	5	–	1	–	10	–	1	–	5	–	7	1	2	–	5	1
15	Brockton	67,706	–	–	–	–	1	–	1	–	15	1	–	–	3	–	–	–
16	Brookline	63,221	–	–	2	–	1	–	–	–	3	–	7	–	2	–	3	1
17	Malden	60,922	–	–	–	–	–	–	3	–	2	1	7	–	7	1	11	–
18	Pittsfield	56,931	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
19	Holyoke	53,775	–	–	–	–	–	–	–	–	–	–	4	–	–	–	–	1
20	Everett	50,088	1	–	1	–	4	–	1	–	4	–	8	–	7	–	3	–
21	Chicopee	47,219	–	–	1	–	–	–	1	–	–	–	11	–	5	–	–	–
22	Waltham	46,693	2	–	1	–	–	–	1	–	2	–	1	–	10	1	–	–
23	Arlington	46,541	–	–	2	–	1	–	1	–	4	–	–	–	11	1	2	–
24	Haverhill	46,162	–	–	–	–	1	–	1	–	3	1	–	–	2	1	–	1
25	Fitchburg	45,447	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
26	Salem	44,232	2	1	5	–	2	–	1	–	1	–	–	–	1	–	–	–
27	Chelsea	39,940	1	–	1	–	–	–	–	–	11	1	32	1	8	–	4	–
28	Taunton	39,661	2	–	7	1	3	–	8	–	20	1	–	–	1	–	2	–
29	Watertown	39,199	–	–	–	–	–	–	–	–	2	–	1	–	4	1	2	–
30	Revere	36,805	–	–	–	–	1	–	2	–	–	–	32	2	15	2	4	–
31	Weymouth	31,556	–	–	1	–	1	1	–	–	–	–	–	–	2	–	–	–
32	Belmont	30,627	–	–	–	–	1	–	1	–	–	–	1	–	1	–	1	1
33	Melrose	30,274	–	–	2	–	6	–	3	–	1	–	1	–	1	–	–	–
34	Beverly	27,925	–	–	–	–	–	–	–	–	–	–	1	–	–	–	2	–
35	Framingham	27,489	1	–	–	–	1	–	3	–	2	–	3	–	1	–	–	–
36	Gloucester	25,562	–	–	–	–	–	–	9	–	12	–	–	–	–	–	2	2
37	Northampton	25,129	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–
38	Leominster	24,697	–	–	–	–	–	–	–	–	3	1	–	–	–	–	3	–
39	Milton	24,366	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

40	Methuen	24,271	1	-	-	-	4	-	-	-	1	-	-	-	-	-	-	-
41	Braintree	23,675	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-
42	Peabody	22,797	1	-	-	-	2	-	1	-	-	-	1	-	1	-	-	-
43	Attleboro	22,621	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44	North Adams	22,230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
45	West Springfield	21,500	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-
46	Westfield	20,963	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
47	Wakefield	20,845	-	-	1	-	1	-	-	-	1	1	2	-	-	-	1	1
48	Winthrop	20,422	-	-	1	-	1	-	1	-	-	-	1	-	1	-	1	-
49	Gardner	20,300	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
50	Woburn	19,976	2	-	5	-	-	-	-	-	1	-	-	-	-	-	-	-
51	Wellesley	19,720	-	-	-	-	-	-	-	-	-	-	1	-	-	-	2	-
52	Saugus	18,267	-	-	1	-	-	-	-	-	-	-	3	-	1	-	-	-
53	Southbridge	18,217	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
54	Greenfield	18,182	-	-	-	-	-	-	-	-	2	-	2	-	-	-	-	-
55	Dedham	17,644	-	-	1	-	-	-	-	-	2	-	2	-	1	-	-	-
56	Natick	17,505	-	-	-	-	-	-	-	-	-	-	1	-	4	-	-	-
57	Norwood	17,493	1	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
58	Needham	16,307	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-	-
59	Milford	16,147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
60	Marlborough	16,132	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
61	Lexington	15,536	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
62	Winchester	15,481	-	-	-	-	-	-	1	-	-	-	1	-	7	-	1	-
63	Danver	15,025	-	-	-	-	1	-	-	-	-	-	-	-	2	-	3	-
64	Newburyport	14,223	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
65	Marblehead	13,964	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
66	Plymouth	13,943	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
67	Webster	13,826	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
68	Reading	13,637	-	-	-	-	-	-	2	-	-	-	2	-	-	-	-	-
69	Stoneham	13,116	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-
70	Fairhaven	13,072	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-
71	Clinton	12,991	-	-	-	-	-	-	-	-	-	-	1	-	-	1	-	-
72	Adams	12,821	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
73	Swampscott	12,781	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
74	Andover	12,620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
75	North Attleboro	12,601	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
76	Athol	12,351	1	-	1	-	-	-	-	-	-	-	-	-	3	1	-	-
77	Hingham	11,132	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-
78	Easthampton	10,830	-	-	1	-	-	-	-	-	1	1	7	-	-	-	-	-
79	Amesbury	10,824	-	-	1	-	-	-	-	-	-	-	1	-	-	-	-	-
80	Shrewsbury	10,791	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
81	Dartmouth	10,712	-	-	-	-	2	-	-	-	1	-	-	-	1	-	-	-
82	Northbridge	10,212	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
83	Palmer	10,211	1	-	-	-	-	-	-	-	6	2	2	-	-	-	-	-
84	Middleborough	10,099	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
85	Stoughton	9,470	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
86	Chelmsford	9,268	-	-	1	-	2	-	3	2	1	-	-	-	-	-	-	-
87	Walpole	9,258	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
88	Randolph	9,210	-	-	-	-	-	-	-	-	3	1	1	-	-	-	-	-
89	Rockland	9,053	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90	Billerica	9,001	2	1	-	-	-	-	-	-	1	1	2	-	-	-	4	-
91	Auburn	8,958	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	DIPHTHERIA															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
92	Barnstable	8,943	–	–	1	–	4	2	1	–	–	–	1	–	–	–	–	–
93	Agawam	8,915	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
94	Concord	8,743	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
95	Whitman	8,740	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
96	Bridgewater	8,641	–	–	–	–	–	–	–	–	1	–	1	–	1	–	–	–
97	Falmouth	8,489	–	–	–	–	1	–	1	–	3	–	–	–	–	–	–	–
98	Grafton	8,425	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
99	Wareham	8,392	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
100	North Andover	8,286	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
101	Millbury	8,268	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
102	Hudson	8,171	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
103	Ludlow	8,065	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
104	South Hadley	7,809	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
105	Franklin	7,735	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
106	Amherst	7,696	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
107	Somerset	7,668	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
108	Montague	7,602	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
109	Ware	7,578	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
110	Dracut	7,524	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–
111	Mansfield	7,380	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
112	Maynard	7,198	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
113	Canton	7,010	2	–	–	–	–	–	–	–	–	–	2	–	–	–	1	–
114	Abington	6,963	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–
115	Longmeadow	6,957	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
116	Westborough	6,866	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
117	Ipswich	6,857	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–
118	Spencer	6,856	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
119	Uxbridge	6,836	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
120	Foxborough	6,627	–	–	2	–	1	–	2	–	1	–	2	–	8	–	1	–
121	Great Barrington	6,581	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
122	Winchendon	6,461	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
123	Wilmington	6,377	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
124	Swansea	6,319	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
125	Easton	6,223	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
126	Westwood	6,053	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
127	Tewskbury	5,949	–	–	1	–	–	–	–	–	2	–	–	–	–	–	–	–
128	Orange	5,907	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
129	Monson	5,713	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
130	Holden	5,648	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

131	Seekonk	5,552	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
132	Scituate	5,526	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
133	Wrentham	5,437	7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
134	Leicester	5,409	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
135	Oxford	5,368	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
136	Westport	5,297	–	–	1	–	–	–	–	–	–	–	–	–	1	–	–	
137	Weston	5,241	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
138	Williamstown	4,919	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
139	Dudley	4,816	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
140	Dalton	4,517	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
141	Bedford	4,486	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
142	Lee	4,444	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
143	Hull	4,437	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
144	Templeton	4,435	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
145	Rockport	4 403	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	1
146	Sharon	4,379	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
147	Acushnet	4,370	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
148	Blackstone	4,349	1	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–
149	Ayer	4,328	–	–	–	–	1	–	–	–	–	–	–	–	–	–	2	–
150	Wayland	4,262	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–
151	Medfield	4,199	–	–	–	–	–	–	1	–	1	–	–	–	–	–	1	–
152	East Longmeadow	4,163	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
153	East Bridgewater	4,158	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
154	Holbrook	4,056	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
155	Belchertown	4,021	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
156	Cohasset	3,947	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
157	Bellingham	3,935	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
158	West Bridgewater	3,905	–	–	–	–	–	–	1	–	–	–	3	–	–	–	–	–
159	Westford	3,815	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
160	Bourne	3,716	1	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–
161	Holliston	3,582	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
162	Provincetown	3,564	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
163	Hopedale	3,518	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
164	Charlton	3,507	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
165	Warren	3,498	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
166	Barre	3,485	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
167	Lynnfield	3,476	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
168	Northboro	3,450	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
169	Wilbraham	3,442	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
170	Deerfield	3,422	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
171	Medway	3,397	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
172	Ashland	3,326	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
173	Rehoboth	3,282	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
174	North Reading	3,270	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
175	Hanover	3,168	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–
176	North Brookfield	3,121	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
177	Pepperell	3,119	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
178	Groton	3,106	–	–	–	–	–	–	1	–	1	–	–	–	–	–	1	–
179	Norton	3,096	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
180	Lancaster	3,092	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
181	Dighton	3,070	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
182	Lunenburg	3,058	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	DIPHTHERIA															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
183	Kingston	3,018	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
184	Burlington	3,017	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
185	Acton	3,004	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
186	Lenox	3,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
187	Hopkinton	2,991	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
188	Nahant	2,890	–	–	–	–	–	–	–	–	–	–	–	–	4	2	–	–
189	West Boylston	2,874	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
190	Nantucket	2,870	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
191	Salisbury	2,828	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
192	Douglas	2,722	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
193	Avon	2,703	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
194	Hamilton	2,696	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
195	Hanson	2,695	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
196	Hadley	2,656	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
197	Sutton	2,610	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
198	Yarmouth	2,608	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
199	Manchester	2,580	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
200	Duxbury	2,486	–	–	–	–	–	–	–	–	–	–	1	1	1	–	–	–
201	Townsend	2,479	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
202	Upton	2,479	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
203	Shirley	2,459	–	–	–	–	–	–	–	–	1	1	–	–	–	–	1	–
204	Middleton	2,456	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
205	Merrimac	2,425	–	–	3	1	–	–	–	–	–	–	–	–	–	–	–	–
206	Southboro	2,421	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
207	Sturbridge	2,420	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
208	Marshfield	2,405	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–
209	Norwell	2,393	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
210	Ashburnham	2,380	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
211	Millis	2,363	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
212	Mattapoisett	2,347	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–
213	Sudbury	2,322	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–
214	Plainville	2,278	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
215	Raynham	2,263	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
216	Chatham	2,241	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
217	Marion	2,216	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
218	Hatfield	2,188	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
219	Lincoln	2,179	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
220	Northfield	2,162	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
221	Westminster	2,153	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–

222	Groveland	2,150	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
223	Southwick	2,141	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
224	Georgetown	2,122	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
225	Hardwick	2,115	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
226	Harwich	2,071	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
227	Sterling	2,043	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
228	Freetown	2,027	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
229	Norfolk	2,006	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
230	Williamsburg	1,980	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
231	Pembroke	1,917	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–
232	Dennis	1,807	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
233	Sheffield	1,801	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
234	Lanesborough	1,754	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
235	Stockbridge	1,739	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
236	Dover	1,736	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
237	Tisbury	1,719	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
238	Cheshire	1,718	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
239	Essex	1,705	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
240	Newbury	1,677	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
241	Littleton	1,673	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
242	Sandwich	1,671	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
243	Shelburne	1,656	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
244	Mendon	1,650	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
245	Orleans	1,642	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
246	Rowley	1,626	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
247	Millville	1,616	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–
248	Rutland	1,561	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
249	Lakeville	1,555	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
250	Wenham	1,550	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
251	Buckland	1,525	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
252	West Brookfield	1,512	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
253	West Newbury	1,503	–	–	–	–	1	–	–	–	1	–	1	1	–	–	–	–
254	Tyngsborough	1,495	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
255	Colrain	1,455	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
256	Clarksburg	1,450	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
257	Stow	1,427	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
258	Brookfield	1,390	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
259	Carver	1,383	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
260	Oak Bluffs	1,345	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
261	Hinsdale	1,325	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
262	Erving	1,315	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
263	Boylston	1,313	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
264	Edgartown	1,296	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
265	Hampden	1,256	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
266	Southampton	1,254	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
267	Chester	1,252	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
268	Huntington	1,242	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
269	Berkley	1,231	–	–	–	–	–	–	–	–	–	–	–	–	2	–	2	–
270	Russell	1,221	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
271	Granby	1,193	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
272	Berlin	1,174	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
273	Ashby	1,155	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	DIPHTHERIA															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
274	Topsfield	1,153	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
275	East Brookfield	1,125	–	–	1	–	–	–	–	–	–	–	–	–	–	–	8	–
276	Rochester	1,107	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
277	Halifax	1,093	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
278	Bernardston	1,070	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
279	Harvard	1,065	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
280	West Stockbridge	1,059	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
281	Sherborn	1,036	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
282	Hubbardston	1,019	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
283	Sunderland	1,018	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
284	Princeton	1,012	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
285	Ashfield	981	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
286	Brimfield	975	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
287	Whately	973	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
288	Gill	918	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
289	Bolton	905	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
290	Paxton	905	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
291	New Marlboro	896	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
292	Conway	867	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
293	Boxford	852	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
294	Wellfleet	851	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
295	Charlemont	812	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
296	Brewster	757	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
297	Royalston	750	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
298	Petersham	743	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
299	Carlisle	697	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
300	Becket	682	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
301	Egremont	660	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
302	Granville	656	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
303	Richmond	646	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
304	Eastham	604	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
305	Leverett	594	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
306	Truro	582	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
307	Blandford	572	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
308	Plympton	545	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
309	Cummington	532	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
310	Pelham	512	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
311	Phillipston	475	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
312	Dunstable	440	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

313	Oakham	424	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
314	Westhampton	413	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
315	New Braintree	409	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
316	Florida	401	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
317	Warwick	401	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
318	Otis	377	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
319	Chesterfield	375	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
320	Sandisfield	370	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
321	New Salem	364	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
322	Worthington	363	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
323	Boxborough	358	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-
324	Wales	354	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
325	Hancock	349	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
326	Wendell	348	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
327	Mashpee	343	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
328	Goshen	328	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
329	Heath	327	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
330	Monterey	305	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
331	Savoy	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
332	Windsor	274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
333	Holland	265	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
334	Leyden	254	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
335	Washington	242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
336	West Tisbury	239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
337	Chilmark	230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
338	Middlefield	226	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
339	Plainfield	224	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
340	Tyringham	211	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
341	Alford	207	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
342	Hawley	203	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
343	Shutesbury	201	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
344	Rowe	178	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
345	Monroe	171	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
346	Montgomery	137	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
347	Peru	116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
348	Gay Head	114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
349	Tolland	111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
350	Gosnold	107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
351	New Ashford	99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
352	Mt. Washington	53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
353	Tewksbury State Hospital		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
354	Military Establishments		-	-	2	-	-	-	9	-	1	-	-	-	-	-	-	-

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities*

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	GERMAN MEASLES															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
1	Massachusetts	4,660,546	7,997	–	34,148	3	1,938	–	1,308	–	4,618	1	932	–	1,076	–	4,555	–
2	Boston	766,386	1,995	–	5,251	–	268	–	181	–	277	–	143	–	168	–	264	–
3	Worcester	203,171	1,035	–	1,256	–	152	–	100	–	646	–	57	–	57	–	536	–
4	Springfield	168,955	78	–	387	–	125	–	33	–	579	–	36	–	28	–	56	–
5	Fall River	115,062	136	–	288	–	18	–	14	–	24	–	22	–	28	–	31	–
6	Cambridge	111,305	242	–	2,271	–	56	–	38	–	91	–	31	–	49	–	48	–
7	Lynn	111,305	60	–	2,173	–	26	–	16	–	13	–	10	–	10	–	390	–
8	New Bedford	110,308	116	–	513	–	36	–	26	–	31	–	18	–	10	–	38	–
9	Somerville	109,135	73	–	278	–	21	–	8	–	18	–	4	–	11	–	10	–
10	Lowell	101,229	13	–	205	1	8	–	3	–	7	–	1	–	4	–	6	–
11	Quincy	87,584	28	–	1,136	–	35	–	8	–	27	–	20	–	26	–	54	–
12	Lawrence	86,714	4	–	147	1	1	–	3	–	4	–	3	–	5	–	5	–
13	Newton	83,715	146	–	872	–	53	–	30	–	109	–	34	–	43	–	50	–
14	Medford	70,548	59	–	352	–	14	–	11	–	11	–	10	–	14	–	49	–
15	Brockton	67,706	71	–	628	–	11	–	4	–	6	–	10	–	5	–	17	–
16	Brookline	63,221	127	–	363	–	20	–	11	–	20	–	2	–	10	–	12	–
17	Malden	60,922	57	–	908	–	14	–	10	–	26	–	22	–	16	–	22	–
18	Pittsfield	56,931	11	–	330	–	7	–	3	–	31	–	1	–	15	–	9	–
19	Holyoke	53,775	13	–	59	–	6	–	7	–	11	–	15	–	18	–	31	–
20	Everett	50,088	11	–	98	–	4	–	–	–	9	–	8	–	5	–	14	–
21	Chicopee	47,219	6	–	12	–	13	–	3	–	28	–	10	–	7	–	34	–
22	Waltham	46,693	21	–	344	–	10	–	14	–	10	–	10	–	3	–	96	–
23	Arlington	46,541	39	–	484	–	11	–	7	–	32	–	10	–	9	–	15	–
24	Haverhill	46,162	56	–	315	–	13	–	12	–	20	–	8	–	17	–	24	–
25	Fitchburg	45,447	10	–	30	–	4	–	12	–	10	–	1	–	7	–	23	–
26	Salem	44,232	14	–	307	–	12	–	5	–	3	–	6	–	1	–	7	–
27	Chelsea	39,940	48	–	227	–	5	–	2	–	2	–	–	–	1	–	11	–
28	Taunton	39,661	–	–	–	–	–	–	1	–	4	–	–	–	–	–	1	–
29	Watertown	39,199	16	–	206	–	16	–	6	–	13	–	4	–	3	–	8	–
30	Revere	36,805	2	–	20	–	5	–	2	–	1	–	–	–	1	–	–	–
31	Weymouth	31,556	5	–	6	–	1	–	–	–	1	–	3	–	1	1	1	–
32	Belmont	30,627	61	–	886	–	17	–	22	–	54	–	14	–	9	–	15	–
33	Melrose	30,274	19	–	249	–	11	–	6	–	51	–	4	–	3	–	6	–
34	Beverly	27,925	31	–	173	–	2	–	1	–	–	–	–	–	3	–	7	–
35	Framingham	27,489	22	–	359	–	8	–	22	–	24	–	8	–	12	–	238	–
36	Gloucester	25,562	44	–	56	–	4	–	3	–	4	–	1	–	3	–	2	–
37	Northampton	25,129	584	–	371	–	195	–	42	–	190	–	21	–	22	–	14	–
38	Leominster	24,697	9	–	20	–	3	–	2	–	3	–	2	–	5	–	48	–
39	Milton	24,366	23	–	160	–	14	–	23	–	19	–	6	–	2	–	26	–

40	Methuen	24,271	13	–	303	–	2	–	2	–	5	–	–	–	–	–	5	–
41	Braintree	23,675	30	–	131	–	10	–	1	–	45	–	4	–	–	–	43	–
42	Peabody	22,797	4	–	38	–	1	–	2	–	2	–	1	–	–	–	5	–
43	Attleboro	22,621	17	–	159	–	15	–	10	–	7	–	–	–	8	–	32	–
44	North Adams	22,230	1	–	9	–	2	–	–	–	1	–	–	–	1	–	120	–
45	West Springfield	21,500	8	–	35	–	7	–	6	–	153	–	6	–	3	–	14	–
46	Westfield	20,963	27	–	6	–	13	–	3	–	12	–	3	–	1	–	50	–
47	Wakefield	20,845	1	–	69	–	3	–	2	–	1	–	2	–	8	–	5	–
48	Winthrop	20,422	57	–	397	–	25	–	19	–	169	–	31	–	31	–	33	–
49	Gardner	20,300	9	–	6	–	–	–	–	–	59	–	20	–	2	–	36	–
50	Woburn	19,976	14	–	59	–	–	–	3	–	–	–	–	–	–	–	–	–
51	Wellesley	19,720	55	–	782	–	12	–	24	–	21	–	9	–	21	–	205	–
52	Saugus	18,267	16	–	139	–	10	–	1	–	2	–	2	–	3	–	11	–
53	Southbridge	18,217	29	–	7	–	2	–	18	–	13	–	6	–	8	–	10	–
54	Greenfield	18,182	7	–	218	–	5	–	5	–	4	–	4	–	5	–	13	–
55	Dedham	17,644	1	–	17	–	3	–	2	–	1	–	5	–	–	–	1	–
56	Natick	17,505	26	–	810	–	32	–	35	–	18	–	9	–	24	–	29	–
57	Norwood	17,493	4	–	12	–	–	–	2	–	–	–	–	–	3	–	–	–
58	Needham	16,307	26	–	308	–	17	–	13	–	38	–	11	–	9	–	271	–
59	Milford	16,147	–	–	10	–	–	–	20	–	46	–	2	–	1	–	1	–
60	Marlborough	16,132	5	–	28	–	1	–	2	–	5	–	2	–	–	–	7	–
61	Lexington	15,536	16	–	130	–	10	–	2	–	10	–	2	–	6	–	54	–
62	Winchester	15,481	45	–	253	–	7	–	6	–	12	–	9	–	6	–	12	–
63	Danvers	15,025	2	–	23	–	–	–	2	–	–	–	–	–	1	–	–	–
64	Newburyport	14,223	75	–	37	–	1	–	3	–	5	–	–	–	3	–	3	–
65	Marblehead	13,964	34	–	512	–	5	–	5	–	6	–	3	–	8	–	7	–
66	Plymouth	13,943	3	–	119	–	1	–	7	–	5	–	–	–	2	–	5	–
67	Webster	13,826	3	–	138	–	3	–	–	–	3	–	–	–	–	–	–	–
68	Reading	13,637	3	–	32	–	1	–	–	–	–	–	–	–	–	–	6	–
69	Stoneham	13,116	17	–	121	–	5	–	6	–	4	–	4	–	6	–	2	–
70	Fairhaven	13,072	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
71	Clinton	12,991	–	–	3	–	4	–	1	–	36	–	1	–	–	–	–	–
72	Adams	12,821	–	–	2	–	–	–	–	–	–	–	–	–	–	–	25	–
73	Swampscott	12,781	19	–	261	–	10	–	7	–	4	–	4	–	5	–	30	–
74	Andover	12,620	22	–	145	–	1	–	10	–	18	–	3	–	–	–	5	–
75	North Attleboro	12,601	–	–	–	–	3	–	6	–	–	–	4	–	1	–	1	–
76	Athol	12,351	1	–	16	–	–	–	–	–	–	–	1	–	–	–	1	–
77	Hingham	11,132	3	–	49	–	1	–	6	–	12	–	7	–	5	–	37	–
78	Easthampton	10,830	52	–	5	–	6	–	1	–	23	–	1	–	4	–	3	–
79	Amesbury	10,824	8	–	97	–	1	–	1	–	–	–	1	–	1	–	1	–
80	Shrewsbury	10,791	9	–	18	–	–	–	–	–	1	–	1	–	1	–	11	–
81	Dartmouth	10,712	5	–	18	–	–	–	2	–	5	–	2	–	3	–	2	–
82	Northbridge	10,212	9	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–
83	Palmer	10,211	2	–	19	–	4	–	3	–	1	–	1	–	–	–	–	–
84	Middleborough	10,099	4	–	287	–	2	–	7	–	–	–	–	–	–	–	–	–
85	Stoughton	9,470	1	–	43	–	1	–	1	–	–	–	–	–	3	–	2	–
86	Chelmsford	9,268	2	–	14	–	1	–	–	–	–	–	–	–	1	–	1	–
87	Walpole	9,258	2	–	71	–	–	–	2	–	1	–	–	–	–	–	–	–
88	Randolph	9,210	1	–	–	–	–	–	1	–	–	–	–	–	1	–	1	–
89	Rockland	9,053	–	–	–	–	–	–	–	–	–	–	–	–	1	–	29	–
90	Billerica	9,001	–	–	17	–	–	–	–	–	–	–	–	–	4	–	–	–
91	Auburn	8,958	119	–	271	–	1	–	5	–	89	–	3	–	–	–	95	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	CITIES AND TOWNS IN ORDER OF POPULATION	Population Estimated as of July 1, 1949	GERMAN MEASLES															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
92	Barnstable	8,943	–	–	39	–	1	–	–	–	–	–	2	–	–	–	4	–
93	Agawam	8,915	7	–	33	–	10	–	1	–	13	–	3	–	2	–	4	–
94	Concord	8,743	43	–	15	–	5	–	4	–	11	–	1	–	–	–	9	–
95	Whitman	8,740	1	–	22	–	–	–	–	–	1	–	–	–	–	–	–	–
96	Bridgewater	8,641	86	–	29	–	3	–	3	–	3	–	–	–	3	–	3	–
97	Falmouth	8,489	28	–	120	–	7	–	5	–	3	–	2	–	5	–	5	–
98	Grafton	8,425	3	–	1	–	–	–	11	–	–	–	1	–	–	–	10	–
99	Wareham	8,392	–	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–
100	North Andover	8,286	1	–	49	–	1	–	4	–	1	–	5	–	–	–	1	–
101	Millbury	8,268	180	–	37	–	8	–	7	–	3	–	–	–	5	–	32	–
102	Hudson	8,171	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
103	Ludlow	8,065	1	–	43	–	3	–	14	–	302	–	6	–	15	–	2	–
104	South Hadley	7,809	10	–	78	–	27	–	–	–	11	–	4	–	4	–	8	–
105	Franklin	7,735	2	–	15	–	–	–	3	–	12	–	–	–	1	–	4	–
106	Amherst	7,696	82	–	182	–	36	–	4	–	8	–	5	–	4	–	24	–
107	Somerset	7,668	19	–	12	–	–	–	–	–	1	–	–	–	–	–	–	–
108	Montague	7,602	–	–	11	–	–	–	–	–	–	–	–	–	–	–	2	–
109	Ware	7,578	2	–	1	–	12	–	1	–	2	–	1	–	2	–	–	–
110	Dracut	7,524	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
111	Mansfield	7,380	17	–	59	–	3	–	1	–	3	–	4	–	5	–	–	–
112	Maynard	7,198	–	–	6	–	1	–	1	–	–	–	–	–	1	–	–	–
113	Canton	7,010	1	–	13	–	–	–	–	–	–	–	–	–	–	–	–	–
114	Abington	6,963	2	–	21	–	1	–	1	–	6	–	1	–	–	–	2	–
115	Longmeadow	6,957	3	–	36	–	5	–	8	–	37	–	–	–	3	–	5	–
116	Westborough	6,866	17	–	20	–	1	–	4	–	7	–	1	–	6	–	26	–
117	Ipswich	6,857	45	–	112	–	–	–	–	–	–	–	–	–	5	–	5	–
118	Spencer	6,856	4	–	–	–	–	–	5	–	58	–	4	–	2	–	41	–
119	Uxbridge	6,836	2	–	3	–	2	–	8	–	2	–	1	–	1	–	8	–
120	Foxborough	6,627	6	–	74	–	3	–	2	–	4	–	6	–	1	–	8	–
121	Great Barrington	6,581	–	–	15	–	23	–	28	–	5	–	5	–	43	–	6	–
122	Winchendon	6,461	2	–	25	–	7	–	4	–	7	–	2	–	–	–	7	–
123	Wilmington	6,377	1	–	5	–	–	–	–	–	–	–	–	–	–	–	–	–
124	Swansea	6,319	16	–	6	–	3	–	–	–	–	–	–	–	1	–	–	–
125	Easton	6,223	10	–	28	–	1	–	–	–	–	–	1	–	4	–	1	–
126	Westwood	6,053	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
127	Tewskbury	5,949	1	–	161	–	1	–	–	–	–	–	–	–	–	–	–	–
128	Orange	5,907	1	–	8	1	–	–	5	–	–	–	–	–	3	–	4	–
129	Monson	5,713	11	–	10	–	1	–	1	–	1	–	–	–	–	–	–	–
130	Holden	5,648	19	–	69	–	5	–	3	–	55	–	4	–	4	–	28	–

131	Seekonk	5,552	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
132	Scituate	5,526	–	–	6	–	3	–	1	–	–	–	–	–	1	–	25	–
133	Wrentham	5,437	8	–	162	–	4	–	8	–	7	–	9	–	5	–	2	–
134	Leicester	5,409	1	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–
135	Oxford	5,368	27	–	2	–	–	–	–	–	–	–	–	–	–	–	1	–
136	Westport	5,297	4	–	17	–	–	–	–	–	–	–	–	–	–	–	1	–
137	Weston	5,241	5	–	37	–	1	–	21	–	1	–	3	–	2	–	4	–
138	Williamstown	4,919	6	–	52	–	2	–	–	–	2	–	1	–	–	–	11	–
139	Dudley	4,816	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
140	Dalton	4,517	–	–	7	–	–	–	–	–	–	–	–	–	29	–	–	–
141	Bedford	4,486	4	–	31	–	1	–	–	–	–	–	1	–	1	–	4	–
142	Lee	4,444	16	–	10	–	–	–	5	–	50	–	17	–	5	–	1	–
143	Hull	4,437	–	–	4	–	–	–	5	–	–	–	–	–	–	–	2	–
144	Templeton	4,435	2	–	–	–	–	–	2	–	7	–	–	–	–	–	22	–
145	Rockport	4,403	2	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
146	Sharon	4,379	–	–	18	–	–	–	1	–	1	–	–	–	–	–	–	–
147	Acushnet	4,370	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
148	Blackstone	4,349	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
149	Ayer	4,328	6	–	47	–	4	–	8	–	2	–	3	–	2	–	42	–
150	Wayland	4,262	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
151	Medfield	4,199	–	–	5	–	–	–	–	–	–	–	1	–	–	–	3	–
152	East Longmeadow	4,163	–	–	7	–	–	–	2	–	1	–	–	–	–	–	–	–
153	East Bridgewater	4,158	9	–	194	–	1	–	–	–	–	–	1	–	1	–	5	–
154	Holbrook	4,056	13	–	39	–	1	–	6	–	2	–	1	–	1	–	–	–
155	Belchertown	4,012	–	–	57	–	1	–	1	–	27	1	1	–	1	–	–	–
156	Cohasset	3,947	–	–	11	–	–	–	–	–	4	–	1	–	4	–	45	–
157	Bellingham	3,935	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
158	West Bridgewater	3,905	22	–	114	–	5	–	2	–	5	–	1	–	1	–	2	–
159	Westford	3,815	6	–	23	–	7	–	3	–	–	–	–	–	3	–	2	–
160	Bourne	3,716	4	–	25	–	6	–	1	–	1	–	1	–	2	–	5	–
161	Holliston	3,582	12	–	–	–	–	–	–	–	–	–	5	–	3	–	12	–
162	Provincetown	3,564	36	–	5	–	22	–	–	–	–	–	–	–	1	–	–	–
163	Hopedale	3,518	–	–	1	–	–	–	1	–	6	–	–	–	–	–	–	–
164	Charlton	3,507	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
165	Warren	3,498	24	–	7	–	2	–	–	–	88	–	–	–	5	–	6	–
166	Barre	3,485	–	–	10	–	5	–	2	–	–	–	1	–	4	–	10	–
167	Lynnfield	3,476	11	–	86	–	18	–	2	–	4	–	1	–	1	–	1	–
168	Northboro	3,450	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
169	Wilbraham	3,442	4	–	24	–	9	–	5	–	160	–	–	–	6	–	2	–
170	Deerfield	3,422	2	–	67	–	–	–	–	–	–	–	3	–	–	–	149	–
171	Medway	3,397	–	–	–	–	–	–	–	–	11	–	–	–	–	–	6	–
172	Ashland	3,326	61	–	82	–	–	–	1	–	1	–	–	–	–	–	–	–
173	Rehoboth	3,282	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
174	North Reading	3,270	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–
175	Hanover	3,168	–	–	18	–	–	–	–	–	–	–	–	–	–	–	5	–
176	North Brookfield	3,121	1	–	3	–	–	–	–	–	–	–	1	–	–	–	–	–
177	Pepperell	3,119	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–
178	Groton	3,106	46	–	41	–	–	–	–	–	3	–	–	–	–	–	1	–
179	Norton	3,096	1	–	20	–	–	–	–	–	–	–	–	–	–	–	–	–
180	Lancaster	3,092	–	–	71	–	2	–	2	–	29	–	3	–	–	–	6	–
181	Dighton	3,070	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
182	Lunenburg	3,058	1	–	5	–	–	–	–	–	–	–	–	–	–	–	31	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	GERMAN MEASLES															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
183	Kingston	3,018	1	–	1	–	–	–	–	–	–	–	–	–	–	–	2	–
184	Burlington	3,017	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
185	Acton	3,004	21	–	34	–	1	–	1	–	4	–	2	–	–	–	1	–
186	Lenox	3,000	6	–	–	–	–	–	1	–	1	–	–	–	–	–	7	–
187	Hopkinton	2,991	7	–	61	–	2	–	4	–	–	–	4	–	7	–	45	–
188	Nahant	2,890	5	–	9	–	–	–	–	–	–	–	–	–	–	–	16	–
189	West Boylston	2,874	8	–	46	–	4	–	28	–	1	–	1	–	–	–	2	–
190	Nantucket	2,870	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
191	Salisbury	2,328	–	–	2	–	1	–	1	–	–	–	–	–	–	–	–	–
192	Douglas	2,722	7	–	18	–	1	–	–	–	–	–	6	–	4	–	1	–
193	Avon	2,703	–	–	129	–	3	–	2	–	–	–	–	–	–	–	–	–
194	Hamilton	2,696	2	–	17	–	–	–	–	–	1	–	3	–	1	–	–	–
195	Hanson	2,695	1	–	13	–	–	–	–	–	2	–	–	–	–	–	–	–
196	Hadley	2,656	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
197	Sutton	2,610	20	–	6	–	2	–	2	–	1	–	3	–	2	–	1	–
198	Yarmouth	2,608	–	–	3	–	–	–	–	–	1	–	–	–	–	–	2	–
199	Manchester	2,580	–	–	22	–	–	–	–	–	9	–	5	–	5	–	5	–
200	Duxbury	2,486	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
201	Townsend	2,479	83	–	–	–	–	–	–	–	–	–	2	–	–	–	66	–
202	Upton	2,479	–	–	7	–	–	–	2	–	7	–	–	–	–	–	–	–
203	Shirley	2,459	1	–	4	–	–	–	–	–	–	–	1	–	–	–	1	–
204	Middleton	2,456	–	–	4	–	3	–	–	–	–	–	–	–	1	–	–	–
205	Merrimac	2,425	–	–	26	–	3	–	5	–	41	–	–	–	–	–	–	–
206	Southboro	2,421	8	–	37	–	–	–	–	–	41	–	–	–	3	–	29	–
207	Sturbridge	2,420	5	–	–	–	–	–	–	–	1	–	–	–	–	–	32	–
208	Marshfield	2,405	–	–	8	–	–	–	–	–	–	–	–	–	–	–	–	–
209	Norwell	2,393	–	–	–	–	–	–	1	–	–	–	–	–	–	–	21	–
210	Ashburnham	2,380	–	–	24	–	–	–	3	–	4	–	–	–	–	–	19	–
211	Millis	2,363	–	–	4	–	–	–	–	–	6	–	–	–	–	–	5	–
212	Mattapoisett	2,347	–	–	2	–	1	–	2	–	–	–	5	–	1	–	–	–
213	Sudbury	2,322	–	–	23	–	1	–	–	–	–	–	–	–	–	–	–	–
214	Plainville	2,278	–	–	–	–	4	–	–	–	–	–	–	–	1	–	4	–
215	Raynham	2,263	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
216	Chatham	2,241	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
217	Marion	2,216	3	–	84	–	1	–	1	–	2	–	–	–	–	–	5	–
218	Hatfield	2,188	17	–	6	–	37	–	–	–	42	–	25	–	–	–	–	–
219	Lincoln	2,179	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
220	Northfield	2,162	6	–	76	–	1	–	1	–	10	–	5	–	1	–	–	–
221	Westminster	2,153	–	–	–	–	1	–	–	–	–	–	–	–	–	–	81	–

222	Groveland . . .	2,150	17	–	8	–	–	–	–	–	–	–	–	–	–	–	81	–
223	Southwick . . .	2,141	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
224	Georgetown . . .	2,122	–	–	7	–	–	–	–	–	–	–	–	–	–	–	–	–
225	Hardwick	2,115	1	–	1	–	3	–	–	–	–	–	–	–	–	–	1	–
226	Harwich	2,071	–	–	–	–	–	–	–	–	–	–	4	–	–	–	–	–
227	Sterling	2,043	1	–	13	–	2	–	2	–	14	–	–	–	1	–	7	–
228	Freetown	2,027	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–
229	Norfolk	2,006	1	–	2	–	1	–	–	–	2	–	–	–	–	–	2	–
230	Williamsburg . . .	1,980	4	–	6	–	3	–	9	–	9	–	3	–	1	–	–	–
231	Pembroke . . .	1,917	–	–	–	–	–	–	1	–	–	–	–	–	–	–	14	–
232	Dennis	1,807	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
233	Sheffield	1,801	3	–	15	–	–	–	2	–	75	–	–	–	3	–	5	–
234	Lanesborough . . .	1,754	–	–	–	–	11	–	–	–	–	–	–	–	–	–	–	–
235	Stockbridge . . .	1,739	1	–	–	–	4	–	–	–	–	–	–	–	–	–	–	–
236	Dover	1,736	3	–	24	–	1	–	–	–	3	–	3	–	–	–	10	–
237	Tisbury	1,719	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
238	Cheshire	1,718	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
239	Essex	1,705	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
240	Newbury	1,677	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
241	Littleton	1,673	1	–	20	–	1	–	3	–	–	–	–	–	–	–	1	–
242	Sandwich	1,671	1	–	3	–	–	–	–	–	–	–	–	–	1	–	–	–
243	Shelburne	1,656	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
244	Mendon	1,650	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
245	Orleans	1,642	2	–	21	–	1	–	–	–	–	–	–	–	–	–	–	–
246	Rowley	1,626	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
247	Millville	1,616	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
248	Rutland	1,561	5	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–
249	Lakeville	1,555	–	–	6	–	–	–	1	–	–	–	1	–	1	–	–	–
250	Wenham	1,550	7	–	27	–	1	–	1	–	3	–	4	–	1	–	3	–
251	Buckland	1,525	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
252	West Brookfield . .	1,512	4	–	12	–	–	–	1	–	13	–	–	–	–	–	3	–
253	West Newbury . . .	1,503	1	–	9	–	–	–	–	–	–	–	1	–	–	–	1	–
254	Tyngsborough . . .	1,495	2	–	81	–	–	–	3	–	1	–	–	–	–	–	–	–
255	Colrain	1,455	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
256	Clarksburg . . .	1,450	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
257	Stow	1,427	1	–	6	–	–	–	–	–	–	–	1	–	–	–	–	–
258	Brookfield . . .	1,390	57	–	15	–	2	–	1	–	19	–	3	–	–	–	3	–
259	Carver	1,383	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
260	Oak Bluffs . . .	1,345	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
261	Hinsdale	1,325	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–
262	Erving	1,315	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
263	Boylston	1,313	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–
264	Edgartown . . .	1,296	–	–	12	–	–	–	–	–	–	–	–	–	–	–	2	–
265	Hampden	1,256	–	–	–	–	–	–	–	–	6	–	–	–	–	–	–	–
266	Southampton . . .	1,254	1	–	–	–	1	–	–	–	5	–	–	–	–	–	–	–
267	Chester	1,252	–	–	1	–	–	–	–	–	–	–	–	–	–	–	7	–
268	Huntington . . .	1,242	4	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–
269	Berkley	1,231	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
270	Russell	1,221	17	–	–	–	–	–	1	–	2	–	–	–	–	–	3	–
271	Granby	1,193	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
272	Berlin	1,174	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–
273	Ashby	1,155	–	–	2	–	–	–	–	–	–	–	–	–	–	–	23	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	GERMAN MEASLES															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
274	Topsfield	1,153	6	–	27	–	2	–	1	–	1	–	–	–	1	–	1	–
275	East Brookfield	1,125	4	–	7	–	2	–	1	–	6	–	1	–	–	–	2	–
276	Rochester	1,107	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
277	Halifax	1,093	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
278	Bernardston	1,070	–	–	9	–	3	–	–	–	1	–	2	–	–	–	–	–
279	Harvard	1,065	–	–	–	–	–	–	–	–	43	–	–	–	–	–	–	–
280	West Stockbridge	1,059	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
281	Sherborn	1,036	2	–	8	–	1	–	2	–	–	–	–	–	–	–	–	–
282	Hubbardston	1,019	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
283	Sunderland	1,018	–	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–
284	Princeton	1,012	5	–	6	–	1	–	–	–	–	–	–	–	1	–	1	–
285	Ashfield	981	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
286	Brimfield	975	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
287	Whately	973	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
288	Gill	918	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–
289	Bolton	905	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–
290	Paxton	905	14	–	3	–	–	–	1	–	–	–	–	–	–	–	1	–
291	New Marlboro	896	–	–	2	–	4	–	–	–	4	–	2	–	2	–	1	–
292	Conway	867	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
293	Boxford	852	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
294	Wellfleet	851	–	–	–	–	–	–	–	–	–	–	4	–	–	–	–	–
295	Charlemont	812	–	–	2	–	–	–	–	–	–	–	1	–	–	–	–	–
296	Brewster	757	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
297	Royalston	750	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
298	Petersham	743	4	–	36	–	–	–	4	–	–	–	–	–	–	–	–	–
299	Carlisle	697	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
300	Becket	682	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
301	Egremont	660	–	–	2	–	–	–	–	–	–	–	–	–	–	–	11	–
302	Granville	656	38	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
303	Richmond	646	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
304	Eastham	604	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
305	Leverett	594	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
306	Truro	582	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
307	Blandford	572	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
308	Plympton	545	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
309	Cummington	532	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
310	Pelham	512	–	–	9	–	–	–	–	–	–	–	–	–	–	–	–	–
311	Phillipston	475	–	–	–	–	–	–	–	–	9	–	–	–	–	–	2	–
312	Dunstable	440	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–

313	Oakham	424	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
314	Westhampton	413	7	–	2	–	5	–	–	–	1	–	–	–	–	–	–	–
315	New Braintree	409	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
316	Florida	401	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
317	Warwick	401	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
318	Otis	377	–	–	–	–	–	–	–	–	2	–	–	–	2	–	–	–
319	Chesterfield	375	1	–	–	–	–	–	4	–	3	–	–	–	–	–	1	–
320	Sandisfield	370	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
321	New Salem	364	–	–	–	–	–	–	3	–	–	–	1	–	–	–	–	–
322	Worthington	363	–	–	–	–	3	–	14	–	–	–	–	–	–	–	–	–
323	Boxborough	358	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
324	Wales	354	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
325	Hancock	349	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
326	Wendell	348	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
327	Mashpee	343	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
328	Goshen	328	2	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
329	Heath	327	3	–	17	–	–	–	–	–	–	–	–	–	7	–	–	–
330	Monterey	305	–	–	4	–	2	–	–	–	–	–	–	–	2	–	1	–
331	Savoy	294	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
332	Windsor	274	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
333	Holland	265	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
334	Leyden	254	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
335	Washington	242	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
336	West Tisbury	239	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
337	Chilmark	230	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
338	Middlefield	226	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
339	Plainfield	224	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
340	Tyringham	211	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
341	Alford	207	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
342	Hawley	203	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
343	Shutesbury	201	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
344	Rowe	178	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
345	Monroe	171	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
346	Montgomery	137	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
347	Peru	116	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
348	Gay Head	114	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
349	Tolland	111	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
350	Gosnold	107	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
351	New Ashford	99	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
352	Mt. Washington	53	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
353	Tewksbury State Hospital		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
354	Military Establishments		521	–	2,381	–	99	–	42	–	4	–	–	–	–	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities*

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	GONORRHEA															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
1	Massachusetts	4,660,546	4,454	5	4,701	3	4,935	–	5,487	–	5,062	1	3,805	–	3,103	–	2,920	–
2	Boston	766,386	1,229	–	1,248	–	1,523	–	1,789	–	2,067	–	1,783	–	1,494	–	1,817	–
3	Worcester	203,171	49	–	54	–	72	–	86	–	156	–	111	–	71	–	58	–
4	Springfield	168,955	164	–	252	–	253	–	236	–	265	–	215	–	160	–	152	–
5	Fall River	115,062	34	1	56	–	53	–	62	–	113	–	55	–	60	–	47	–
6	Cambridge	111,305	70	–	105	–	129	–	124	–	162	–	114	–	67	–	66	–
7	Lynn	111,305	42	–	53	–	52	–	155	–	122	–	77	–	27	–	49	–
8	New Bedford	110,308	116	–	88	1	96	–	114	–	173	–	96	–	70	–	43	–
9	Somerville	109,135	59	–	51	–	73	–	82	–	75	–	56	–	54	–	40	–
10	Lowell	101,229	33	1	56	–	73	–	102	–	133	–	69	–	18	–	23	–
11	Quincy	87,584	38	–	53	–	60	–	45	–	28	–	18	–	8	–	16	–
12	Lawrence	86,714	32	–	30	–	57	–	56	–	29	–	19	–	9	–	17	–
13	Newton	83,715	19	–	15	–	23	–	19	–	28	–	21	–	23	–	10	–
14	Medford	70,548	17	–	31	–	30	–	41	–	31	–	26	–	14	–	9	–
15	Brockton	67,706	20	–	28	–	44	–	39	–	31	–	19	–	12	–	5	–
16	Brookline	63,221	20	–	20	–	22	–	30	–	24	–	23	–	14	–	25	–
17	Malden	60,922	33	–	22	–	46	–	44	–	32	–	32	–	20	–	23	–
18	Pittsfield	56,931	11	–	14	–	12	–	26	–	32	–	9	–	2	–	5	–
19	Holyoke	53,775	12	–	22	–	42	–	38	–	31	–	22	–	11	–	14	–
20	Everett	50,088	26	–	24	1	32	–	66	–	26	–	25	–	13	–	15	–
21	Chicopee	47,219	19	1	17	–	13	–	23	–	19	–	9	–	7	–	8	–
22	Waltham	46,693	10	–	26	–	29	–	39	–	23	–	10	–	10	–	14	–
23	Arlington	46,541	9	–	9	–	19	–	13	–	13	–	10	–	6	–	6	–
24	Haverhill	46,162	30	–	43	–	52	–	78	–	64	1	33	–	20	–	26	–
25	Fitchburg	45,447	23	–	14	–	33	–	37	–	38	–	28	–	31	–	8	–
26	Salem	44,232	11	–	20	–	34	–	51	–	31	–	30	–	11	–	17	–
27	Chelsea	39,940	29	–	22	–	25	–	125	–	48	–	26	–	16	–	19	–
28	Taunton	39,661	11	–	21	–	8	–	18	–	5	–	10	–	7	–	7	–
29	Watertown	39,199	20	–	15	–	15	–	8	–	23	–	10	–	7	–	7	–
30	Revere	36,805	25	–	27	–	49	–	70	–	48	–	18	–	11	–	15	–
31	Weymouth	31,556	9	–	22	–	24	–	15	–	11	–	9	–	7	–	5	–
32	Belmont	30,627	5	–	8	–	6	–	7	–	6	–	7	–	4	–	2	–
33	Melrose	30,274	9	–	7	–	17	–	11	–	12	–	3	–	4	–	5	–
34	Beverly	27,925	15	–	21	–	30	–	36	–	20	–	12	–	8	–	13	–
35	Framingham	27,489	9	–	11	–	13	–	16	–	14	–	11	–	8	–	2	–
36	Gloucester	25,562	10	–	10	–	14	–	33	–	19	–	14	–	13	–	7	–
37	Northampton	25,129	7	–	12	–	10	–	3	–	22	–	6	–	3	–	7	–
38	Leominster	24,697	5	–	4	–	5	–	10	–	1	–	–	–	2	–	3	–
39	Milton	24,366	3	–	4	–	–	–	6	–	–	–	3	–	2	–	2	–

40	Methuen	24,271	–	–	3	–	9	–	11	–	8	–	5	–	5	–	3	–
41	Braintree	23,675	9	–	11	–	11	–	9	–	16	–	7	–	5	–	6	–
42	Peabody	22,797	9	–	17	–	12	–	17	–	12	–	13	–	10	–	3	–
43	Attleboro	22,621	12	–	7	–	12	–	11	–	17	–	1	–	3	–	2	–
44	North Adams	22,230	–	–	–	–	7	–	6	–	12	–	5	–	3	–	1	–
45	West Springfield	21,500	4	–	4	–	10	–	15	–	15	–	4	–	9	–	6	–
46	Westfield	20,963	4	–	7	–	8	–	5	–	15	–	9	–	9	–	10	–
47	Wakefield	20,845	9	–	1	–	11	–	2	–	8	–	13	–	6	–	7	–
48	Winthrop	20,422	9	–	11	–	12	–	5	–	10	–	4	–	6	–	4	–
49	Gardner	20,300	10	–	5	–	9	–	9	–	5	–	5	–	–	–	2	–
50	Woburn	19,976	8	–	3	–	20	–	14	–	9	–	12	–	5	–	2	–
51	Wellesley	19,720	3	–	3	–	1	–	1	–	2	–	1	–	–	–	1	–
52	Saugus	18,267	12	–	7	–	8	–	19	–	10	–	8	–	9	–	4	–
53	Southbridge	18,217	3	–	1	–	1	–	3	–	11	–	3	–	–	–	1	–
54	Greenfield	18,182	4	–	11	–	14	–	21	–	11	–	7	–	3	–	–	–
55	Dedham	17,644	6	–	2	–	1	–	5	–	6	–	4	–	4	–	6	–
56	Natick	17,505	10	–	3	–	12	–	11	–	7	–	4	–	4	–	3	–
57	Norwood	17,493	8	–	2	–	11	–	5	–	6	–	3	–	1	–	3	–
58	Needham	16,307	1	–	8	–	1	–	3	–	2	–	2	–	3	–	–	–
59	Milford	16,147	1	–	5	–	5	–	6	–	7	–	4	–	5	–	2	–
60	Marlborough	16,132	4	–	1	–	3	–	3	–	12	–	4	–	–	–	–	–
61	Lexington	15,536	1	–	5	–	7	–	9	–	4	–	1	–	2	–	2	–
62	Winchester	15,481	3	–	1	–	2	–	3	–	2	–	4	–	2	–	1	–
63	Danvers	15,025	2	–	6	–	2	–	2	–	11	–	4	–	3	–	3	–
64	Newburyport	14,223	7	–	4	–	22	–	21	–	12	–	13	–	5	–	3	–
65	Marblehead	13,964	3	–	2	–	3	–	10	–	2	–	1	–	2	–	–	–
66	Plymouth	13,943	4	–	6	–	2	–	3	–	12	–	3	–	1	–	2	–
67	Webster	13,826	2	–	3	–	5	–	9	–	11	–	2	–	2	–	1	–
68	Reading	13,637	10	–	3	–	3	–	8	–	2	–	5	–	1	–	4	–
69	Stoneham	13,116	7	–	4	–	6	–	4	–	3	–	5	–	1	–	3	–
70	Fairhaven	13,072	3	–	2	–	5	–	6	–	13	–	3	–	3	–	2	–
71	Clinton	12,991	1	–	3	–	5	–	2	–	9	–	1	–	–	–	1	–
72	Adams	12,821	3	–	3	–	5	–	10	–	5	–	2	–	3	–	–	–
73	Swampscott	12,781	1	–	3	–	2	–	6	–	3	–	3	–	1	–	2	–
74	Andover	12,620	3	–	1	–	–	–	–	–	1	–	–	–	–	–	3	–
75	North Attleboro	12,601	–	–	2	–	–	–	1	–	3	–	–	–	1	–	2	–
76	Athol	12,351	7	–	5	–	7	–	6	–	4	–	2	–	8	–	4	–
77	Hingham	11,132	4	–	4	–	2	–	5	–	2	–	1	–	–	–	2	–
78	Easthampton	10,830	2	–	2	–	8	–	9	–	9	–	2	–	1	–	2	–
79	Amesbury	10,824	3	–	4	–	14	–	18	–	12	–	8	–	5	–	2	–
80	Shrewsbury	10,791	–	–	2	–	2	–	1	–	1	–	1	–	1	–	1	–
81	Dartmouth	10,712	4	–	1	–	3	–	2	–	3	–	6	–	3	–	2	–
82	Northbridge	10,212	1	–	–	–	4	–	3	–	8	–	4	–	1	–	1	–
83	Palmer	10,211	–	–	1	–	3	–	3	–	6	–	2	–	1	–	1	–
84	Middleborough	10,099	4	–	8	–	–	–	1	–	3	–	–	–	–	–	1	–
85	Stoughton	9,470	5	–	4	–	3	–	1	–	15	–	9	–	1	–	1	–
86	Chelmsford	9,268	–	–	–	–	2	–	1	–	1	–	1	–	1	–	1	–
87	Walpole	9,258	3	–	2	–	1	–	–	–	4	–	2	–	–	–	–	–
88	Randolph	9,210	2	–	2	–	4	–	–	–	2	–	–	–	–	–	1	–
89	Rockland	9,053	1	–	–	–	1	–	–	–	2	–	3	–	2	–	2	–
90	Billerica	9,001	3	–	4	–	1	–	1	–	4	–	2	–	–	–	4	–
91	Auburn	8,958	1	–	–	–	–	–	–	–	1	–	1	–	2	–	1	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	GONORRHEA															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
92	Barnstable	8,943	5	–	5	1	2	–	5	–	5	–	1	–	–	–	3	–
93	Agawam	8,915	3	–	2	–	4	–	1	–	4	–	2	–	–	–	6	–
94	Concord	8,743	1	–	3	–	4	–	1	–	3	–	1	–	2	–	–	–
95	Whitman	8,740	7	–	5	–	8	–	2	–	2	–	3	–	1	–	–	–
96	Bridgewater	8,641	2	–	3	–	3	–	–	–	–	–	2	–	–	–	1	–
97	Falmouth	8,489	18	–	20	–	23	–	7	–	10	–	7	–	1	–	5	–
98	Grafton	8,425	–	–	–	–	–	–	3	–	3	–	1	–	–	–	–	–
99	Wareham	8,392	21	1	9	–	13	–	22	–	27	–	17	–	4	–	15	–
100	North Andover	8,286	–	–	2	–	1	–	1	–	–	–	–	–	–	–	3	–
101	Millbury	8,268	4	–	–	–	1	–	–	–	3	–	3	–	1	–	–	–
102	Hudson	8,171	4	–	3	–	6	–	7	–	7	–	3	–	1	–	1	–
103	Ludlow	8,065	2	–	6	–	8	–	5	–	–	–	3	–	1	–	2	–
104	South Hadley	7,809	1	–	1	–	–	–	2	–	3	–	3	–	–	–	–	–
105	Franklin	7,735	2	–	–	–	2	–	9	–	6	–	3	–	1	–	–	–
106	Amherst	7,696	3	–	1	–	5	–	5	–	8	–	4	–	2	–	–	–
107	Somerset	7,668	1	–	–	–	3	–	1	–	3	–	5	–	2	–	1	–
108	Montague	7,602	1	–	–	–	3	–	4	–	3	–	–	–	–	–	–	–
109	Ware	7,578	–	–	1	–	–	–	–	–	3	–	–	–	–	–	–	–
110	Dracut	7,524	–	–	5	–	1	–	9	–	3	–	5	–	–	–	–	–
111	Mansfield	7,380	5	–	2	–	1	–	3	–	3	–	–	–	2	–	2	–
112	Maynard	7,198	3	–	1	–	2	–	3	–	2	–	–	–	2	–	–	–
113	Canton	7,010	1	–	2	–	3	–	9	–	11	–	7	–	1	–	2	–
114	Abington	6,963	–	–	3	–	3	–	1	–	3	–	–	–	–	–	–	–
115	Longmeadow	6,957	–	–	–	–	1	–	1	–	2	–	1	–	–	–	–	–
116	Westborough	6,866	–	–	2	–	1	–	2	–	1	–	–	–	1	–	1	–
117	Ipswich	6,857	4	–	3	–	8	–	9	–	9	–	21	–	16	–	2	–
118	Spencer	6,856	2	–	3	–	2	–	1	–	3	–	–	–	1	–	1	–
119	Uxbridge	6,836	–	–	3	–	5	–	2	–	5	–	–	–	–	–	1	–
120	Foxborough	6,627	–	–	–	–	3	–	3	–	–	–	–	–	–	–	–	–
121	Great Barrington	6,581	4	–	2	–	–	–	2	–	3	–	2	–	–	–	–	–
122	Winchendon	6,461	4	–	3	–	7	–	3	–	1	–	2	–	1	–	2	–
123	Wilmington	6,377	2	–	1	–	3	–	4	–	3	–	1	–	–	–	–	–
124	Swansea	6,319	2	–	3	–	2	–	1	–	2	–	1	–	1	–	2	–
125	Easton	6,223	1	–	2	–	2	–	2	–	2	–	–	–	1	–	–	–
126	Westwood	6,053	–	–	–	–	3	–	–	–	2	–	–	–	–	–	–	–
127	Tewskbury	5,949	2	–	–	–	1	–	2	–	1	–	4	–	2	–	2	–
128	Orange	5,907	6	–	1	–	1	–	1	–	2	–	–	–	–	–	–	–
129	Monson	5,713	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
130	Holden	5,648	3	–	1	–	1	–	1	–	3	–	1	–	–	–	–	–

131	Seekonk	5,552	2	–	2	–	–	–	1	–	–	–	–	–	–	–	1	–
132	Scituate	5,526	2	–	2	–	1	–	4	–	5	–	1	–	1	–	2	–
133	Wrentham	5,437	4	–	3	–	1	–	–	–	3	–	1	–	1	–	–	–
134	Leicester	5,409	1	–	2	–	2	–	–	–	1	–	–	–	–	–	–	–
135	Oxford	5,368	–	–	1	–	2	–	1	–	–	–	–	–	1	–	–	–
136	Westport	5,297	2	–	–	–	2	–	3	–	–	–	1	–	1	–	–	–
137	Weston	5,241	3	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–
138	Williamstown	4,919	1	–	2	–	–	–	3	–	2	–	2	–	–	–	–	–
139	Dudley	4,816	–	–	–	–	2	–	2	–	5	–	–	–	1	–	–	–
140	Dalton	4,517	–	–	1	–	1	–	1	–	1	–	–	–	–	–	–	–
141	Bedford	4,486	1	–	1	–	1	–	–	–	2	–	1	–	–	–	–	–
142	Lee	4,444	3	–	3	–	2	–	4	–	3	–	4	–	1	–	1	–
143	Hull	4,437	4	–	1	–	1	–	–	–	–	–	3	–	–	–	1	–
144	Templeton	4,435	2	–	–	–	–	–	3	–	2	–	1	–	1	–	–	–
145	Rockport	4,403	5	–	1	–	1	–	3	–	3	–	5	–	–	–	1	–
146	Sharon	4,379	5	–	9	–	6	–	5	–	1	–	1	–	4	–	–	–
147	Acushnet	4,370	–	–	–	–	1	–	1	–	3	–	1	–	–	–	–	–
148	Blackstone	4,349	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
149	Ayer	4,328	4	–	5	–	4	–	1	–	6	–	11	–	–	–	1	–
150	Wayland	4,262	3	–	2	–	–	–	2	–	1	–	–	–	1	–	–	–
151	Medfield	4,199	1	–	3	–	1	–	1	–	1	–	1	–	2	–	2	–
152	East Longmeadow . . .	4,163	–	–	1	–	–	–	4	–	2	–	1	–	–	–	–	–
153	East Bridgewater . . .	4,158	2	–	2	–	1	–	–	–	2	–	1	–	–	–	1	–
154	Holbrook	4,056	–	–	1	–	5	–	1	–	2	–	4	–	2	–	1	–
155	Belchertown	4,021	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
156	Cohasset	3,947	2	–	–	–	–	–	2	–	3	–	4	–	–	–	1	–
157	Bellingham	3,935	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–
158	West Bridgewater . . .	3,905	–	–	–	–	4	–	3	–	3	–	–	–	–	–	–	–
159	Westford	3,815	–	–	–	–	2	–	2	–	1	–	–	–	–	–	–	–
160	Bourne	3,716	7	–	4	–	2	–	7	–	5	–	4	–	–	–	2	–
161	Holliston	3,582	2	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–
162	Provincetown	3,564	2	–	3	–	1	–	1	–	–	–	4	–	–	–	–	–
163	Hopedale	3,518	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
164	Charlton	3,507	1	–	–	–	–	–	1	–	2	–	–	–	–	–	–	–
165	Warren	3,498	1	–	–	–	3	–	–	–	1	–	1	–	–	–	1	–
166	Barre	3,485	1	–	3	–	1	–	2	–	4	–	2	–	–	–	–	–
167	Lynnfield	3,476	–	–	–	–	4	–	1	–	2	–	–	–	–	–	1	–
168	Northboro	3,450	2	–	–	–	1	–	1	–	1	–	–	–	–	–	–	–
169	Wilbraham	3,442	–	–	2	–	–	–	–	–	2	–	1	–	2	–	1	–
170	Deerfield	3,422	1	–	1	–	3	–	4	–	–	–	–	–	–	–	–	–
171	Medway	3,397	1	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–
172	Ashland	3,326	4	–	1	–	1	–	2	–	–	–	–	–	–	–	2	–
173	Rehoboth	3,282	–	–	–	–	1	–	1	–	–	–	1	–	–	–	–	–
174	North Reading	3,270	4	–	–	–	7	–	–	–	2	–	2	–	1	–	–	–
175	Hanover	3,168	–	–	1	–	–	–	2	–	1	–	1	–	1	–	–	–
176	North Brookfield . . .	3,121	1	–	1	–	1	–	1	–	4	–	–	–	2	–	–	–
177	Pepperell	3,119	2	–	2	–	1	–	7	–	5	–	2	–	–	–	–	–
178	Groton	3,106	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
179	Norton	3,096	5	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–
180	Lancaster	3,092	–	–	–	–	1	–	–	–	1	–	–	–	–	–	1	–
181	Dighton	3,070	1	–	–	–	1	–	1	–	3	–	–	–	–	–	–	–
182	Lunenburg	3,058	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	CITIES AND TOWNS IN ORDER OF POPULATION	Population Estimated as of July 1, 1949	GONORRHEA															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
183	Kingston	3,018	1	–	–	–	–	–	–	–	4	–	–	–	–	–	–	–
184	Burlington	3,017	2	–	4	–	1	–	–	–	1	–	1	–	1	–	–	–
185	Acton	3,004	–	–	2	–	5	–	1	–	2	–	–	–	–	–	–	–
186	Lenox	3,000	2	–	1	–	1	–	1	–	5	–	3	–	–	–	–	–
187	Hopkinton	2,991	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–
188	Nahant	2,890	–	–	–	–	1	–	2	–	3	–	–	–	–	–	–	–
189	West Boylston	2,874	2	–	–	–	1	–	–	–	2	–	1	–	–	–	–	–
190	Nantucket	2,870	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
191	Salisbury	2,828	1	–	–	–	7	–	4	–	1	–	3	–	–	–	3	–
192	Douglas	2,722	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–
193	Avon	2,703	–	–	1	–	–	–	–	–	–	–	1	–	2	–	1	–
194	Hamilton	2,696	1	–	–	–	2	–	1	–	2	–	–	–	–	–	–	–
195	Hanson	2,695	2	–	3	–	2	–	–	–	–	–	2	–	–	–	1	–
196	Hadley	2,656	2	–	1	–	1	–	1	–	1	–	–	–	–	–	–	–
197	Sutton	2,610	–	–	1	–	–	–	–	–	–	–	–	–	2	–	–	–
198	Yarmouth	2,608	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
199	Manchester	2,580	–	–	–	–	1	–	–	–	2	–	5	–	–	–	–	–
200	Duxbury	2,486	2	–	–	–	1	–	1	–	4	–	2	–	–	–	–	–
201	Townsend	2,479	–	–	1	–	2	–	–	–	2	–	–	–	–	–	–	–
202	Upton	2,479	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
203	Shirley	2,459	2	–	–	–	1	–	4	–	–	–	–	–	–	–	–	–
204	Middleton	2,456	3	–	–	–	3	–	3	–	1	–	1	–	1	–	–	–
205	Merrimac	2,425	1	1	1	–	1	–	1	–	–	–	–	–	–	–	–	–
206	Southboro	2,421	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
207	Sturbridge	2,420	1	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–
208	Marshfield	2,405	3	–	2	–	–	–	–	–	–	–	–	–	–	–	2	–
209	Norwell	2,393	2	–	1	–	1	–	–	–	1	–	–	–	–	–	–	–
210	Ashburnham	2,380	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
211	Millis	2,363	2	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–
212	Mattapoisett	2,347	2	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–
213	Sudbury	2,322	–	–	–	–	2	–	–	–	–	–	–	–	1	–	–	–
214	Plainville	2,278	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
215	Raynham	2,263	1	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–
216	Chatham	2,241	1	–	1	–	1	–	–	–	2	–	–	–	–	–	–	–
217	Marion	2,216	1	–	–	–	1	–	–	–	3	–	1	–	2	–	2	–
218	Hatfield	2,188	–	–	–	–	–	–	1	–	5	–	1	–	2	–	–	–
219	Lincoln	2,179	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
220	Northfield	2,162	–	–	–	–	–	–	1	–	1	–	1	–	–	–	–	–
221	Westminster	2,153	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–

222	Groveland . . .	2,150	1	–	–	–	–	–	1	–	1	–	–	–	1	–	–	–
223	Southwick . . .	2,141	–	–	–	–	1	–	–	–	4	–	5	–	7	–	6	–
224	Georgetown . . .	2,122	1	–	–	–	2	–	–	–	2	–	1	–	1	–	4	–
225	Hardwick . . .	2,115	–	–	1	–	–	–	3	–	–	–	–	–	–	–	–	–
226	Harwich	2,071	–	–	1	–	1	–	–	–	–	–	1	–	–	–	–	–
227	Sterling	2,043	3	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
228	Freetown	2,027	1	–	1	–	–	–	2	–	3	–	3	–	–	–	–	–
229	Norfolk	2,006	1	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
230	Williamsburg . . .	1,980	–	–	–	–	–	–	–	–	1	–	2	–	–	–	–	–
231	Pembroke	1,917	–	–	1	–	–	–	–	–	2	–	–	–	–	–	–	–
232	Dennis	1,807	1	–	2	–	1	–	–	–	–	–	–	–	–	–	–	–
233	Sheffield	1,801	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–
234	Lanesborough . . .	1,754	–	–	1	–	–	–	1	–	–	–	1	–	–	–	–	–
235	Stockbridge . . .	1,739	1	–	–	–	2	–	1	–	2	–	–	–	1	–	–	–
236	Dover	1,736	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–
237	Tisbury	1,719	1	–	1	–	3	–	–	–	–	–	–	–	–	–	1	–
238	Cheshire	1,718	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
239	Essex	1,705	–	–	–	–	1	–	1	–	1	–	2	–	1	–	–	–
240	Newbury	1,677	–	–	–	–	3	–	1	–	–	–	–	–	–	–	–	–
241	Littleton	1,673	–	–	–	–	4	–	–	–	–	–	–	–	1	–	1	–
242	Sandwich	1,671	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
243	Shelburne	1,656	–	–	1	–	1	–	–	–	2	–	–	–	–	–	–	–
244	Mendon	1,650	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
245	Orleans	1,642	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
246	Rowley	1,626	1	–	1	–	–	–	1	–	2	–	4	–	–	–	–	–
247	Millville	1,616	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
248	Rutland	1,561	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
249	Lakeville	1,555	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
250	Wenham	1,550	–	–	–	–	1	–	2	–	–	–	–	–	–	–	–	–
251	Buckland	1,525	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
252	West Brookfield . .	1,512	–	–	2	–	–	–	–	–	2	–	–	–	–	–	–	–
253	West Newbury . . .	1,503	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
254	Tyngsborough . . .	1,495	1	–	1	–	1	–	–	–	1	–	–	–	–	–	1	–
255	Colrain	1,455	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–
256	Clarksburg . . .	1,450	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
257	Stow	1,427	1	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–
258	Brookfield . . .	1,390	–	–	2	–	1	–	–	–	1	–	–	–	–	–	–	–
259	Carver	1,383	–	–	–	–	–	–	1	–	3	–	1	–	1	–	2	–
260	Oak Bluffs . . .	1,345	–	–	–	–	2	–	1	–	–	–	2	–	–	–	1	–
261	Hinsdale	1,325	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–
262	Erving	1,315	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
263	Boylston	1,313	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
264	Edgartown . . .	1,296	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–
265	Hampden	1,256	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
266	Southampton . . .	1,254	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
267	Chester	1,252	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–
268	Huntington . . .	1,242	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
269	Berkley	1,231	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
270	Russell	1,221	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
271	Granby	1,193	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
272	Berlin	1,174	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
273	Ashby	1,155	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	GONORRHEA															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
274	Topsfield	1,153	–	–	–	–	–	–	–	–	–	–	–	–	3	–	1	–
275	East Brookfield	1,125	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–
276	Rochester	1,107	2	–	–	–	–	–	1	–	5	–	2	–	–	–	–	–
277	Halifax	1,093	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
278	Bernardston	1,070	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
279	Harvard	1,065	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
280	West Stockbridge	1,059	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
281	Sherborn	1,036	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
282	Hubbardston	1,019	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
283	Sunderland	1,018	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
284	Princeton	1,012	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
285	Ashfield	981	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
286	Brimfield	975	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
287	Whately	973	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
288	Gill	918	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–
289	Bolton	905	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
290	Paxton	905	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
291	New Marlboro	896	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
292	Conway	867	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
293	Boxford	852	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
294	Wellfleet	851	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
295	Charlemont	812	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–
296	Brewster	757	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
297	Royalston	750	1	–	1	–	1	–	1	–	–	–	1	–	–	–	–	–
298	Petersham	743	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
299	Carlisle	697	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
300	Becket	682	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
301	Egremont	660	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
302	Granville	656	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
303	Richmond	646	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
304	Eastham	604	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
305	Leverett	594	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
306	Truro	582	–	–	1	–	–	–	–	–	–	–	1	–	–	–	–	–
307	Blandford	572	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
308	Plympton	545	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
309	Cummington	532	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
310	Pelham	512	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
311	Phillipston	475	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
312	Dunstable	440	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

		Population																
313	Oakham	424	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
314	Westhampton	413	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
315	New Braintree	409	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
316	Florida	401	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
317	Warwick	401	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
318	Otis	377	–	–	1	–	2	–	–	–	–	–	–	–	1	–	–	–
319	Chesterfield	375	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
320	Sandisfield	370	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
321	New Salem	364	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
322	Worthington	363	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
323	Boxborough	358	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
324	Wales	354	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
325	Hancock	349	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
326	Wendell	348	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
327	Mashpee	343	2	–	1	–	1	–	–	–	1	–	3	–	–	–	–	–
328	Goshen	328	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
329	Heath	327	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
330	Monterey	305	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
331	Savoy	294	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
332	Windsor	274	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
333	Holland	265	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
334	Leyden	254	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
335	Washington	242	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
336	West Tisbury	239	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
337	Chilmark	230	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
338	Middlefield	226	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
339	Plainfield	224	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
340	Tyringham	211	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
341	Alford	207	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
342	Hawley	203	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
343	Shutesbury	201	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
344	Rowe	178	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
345	Monroe	171	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
346	Montgomery	137	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
347	Peru	116	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
348	Gay Head	114	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
349	Tolland	111	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
350	Gosnold	107	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
351	New Ashford	99	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
352	Mt. Washington	53	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
353	Tewksbury State Hospital		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
354	Military Establishments		1,692	–	1,753	–	1,260	–	1,146	–	383	–	333	–	528	–	85	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities*

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	MEASLES															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
1	Massachusetts	4,660,546	25,590	16	35,098	21	19,837	20	7,486	10	38,400	14	12,065	12	37,081	18	26,394	12
2	Boston	766,386	4,894	3	5,148	2	3,678	3	2,215	1	5,908	1	1,672	–	7,873	5	867	–
3	Worcester	203,171	179	–	3,896	1	115	–	713	–	4,625	–	234	1	4,147	1	1,698	1
4	Springfield	168,955	1,070	1	444	–	1,077	1	53	–	1,247	1	312	–	199	–	2,576	3
5	Fall River	115,062	539	–	1,355	2	401	–	30	–	1,134	2	298	2	1,249	1	718	–
6	Cambridge	111,305	1,343	1	1,131	–	310	1	181	–	2,099	1	134	–	1,467	2	221	–
7	Lynn	111,305	1,116	–	246	–	1,010	1	36	–	1,310	2	29	–	740	–	523	–
8	New Bedford	110,308	503	–	770	3	188	–	37	–	528	–	979	1	92	–	1,301	1
9	Somerville	109,135	133	–	422	1	251	1	69	1	546	1	32	–	585	1	39	–
10	Lowell	101,229	27	–	345	1	67	–	33	–	489	–	8	–	807	1	234	1
11	Quincy	87,584	823	–	1,195	–	546	–	41	–	1,002	1	127	–	2,425	–	94	–
12	Lawrence	86,714	184	–	106	–	157	3	7	–	658	1	10	–	241	–	353	–
13	Newton	83,715	867	–	1,712	1	341	1	314	–	1,076	–	104	–	1,129	–	265	–
14	Medford	70,548	256	–	326	–	365	–	50	–	478	–	27	–	576	–	51	–
15	Brockton	67,706	165	–	273	–	37	–	9	–	309	–	759	–	32	–	136	1
16	Brookline	63,221	616	–	207	–	497	–	212	–	262	–	255	–	462	–	79	–
17	Malden	60,922	346	–	612	1	638	–	29	–	374	–	156	–	552	–	80	–
18	Pittsfield	56,931	49	–	586	–	103	1	10	–	352	–	33	–	769	–	459	–
19	Holyoke	53,775	27	–	320	–	141	–	39	–	86	–	218	–	28	–	508	–
20	Everett	50,088	60	–	46	–	271	–	7	1	133	–	17	–	346	–	19	–
21	Chicopee	47,219	108	–	162	–	210	–	9	1	140	–	111	–	25	–	413	–
22	Waltham	46,693	90	–	437	–	98	–	213	–	655	–	13	–	136	–	59	–
23	Arlington	46,541	296	–	231	–	2-3	–	40	–	759	–	13	–	600	–	26	–
24	Haverhill	46,162	188	–	509	–	51	–	685	–	49	–	49	–	389	1	94	–
25	Fitchburg	45,447	12	–	248	–	2	–	5	–	147	–	54	–	131	–	156	–
26	Salem	44,232	126	–	94	–	248	–	90	1	204	–	25	–	191	–	67	–
27	Chelsea	39,940	75	–	110	–	376	1	5	–	363	–	12	–	161	–	15	–
28	Taunton	39,661	1	–	–	–	–	–	2	–	124	–	83	–	38	–	120	–
29	Watertown	39,199	176	–	476	–	55	–	32	–	361	–	20	–	503	–	33	–
30	Revere	36,805	23	1	8	–	75	1	78	–	51	–	–	–	124	–	19	–
31	Weymouth	31,556	39	–	27	–	26	–	2	–	60	–	69	–	83	–	11	–
32	Belmont	30,627	555	1	165	–	100	–	29	–	850	–	14	–	416	–	141	–
33	Melrose	30,274	148	–	356	–	258	–	16	–	208	–	144	1	166	–	385	–
34	Beverly	27,925	106	–	40	–	489	–	5	–	51	–	1	–	114	–	29	–
35	Framingham	27,489	875	–	239	–	20	–	47	–	297	–	186	–	53	–	60	–
36	Gloucester	25,562	33	–	116	2	2	–	2	–	101	–	1	–	7	–	70	–
37	Northampton	25,129	98	–	79	–	546	2	8	–	191	–	130	–	534	–	107	–
38	Leominster	24,697	24	–	615	–	8	–	20	–	363	–	23	1	411	–	406	1
39	Milton	24,366	306	–	194	–	171	–	59	–	129	–	37	–	287	–	31	–

40	Methuen	24,271	144	–	20	–	107	–	6	1	266	–	6	–	77	–	354	–
41	Braintree	23,675	105	–	448	–	96	–	28	–	375	–	13	–	409	–	88	–
42	Peabody	22,797	23	–	81	–	103	–	4	–	99	–	2	–	18	1	139	–
43	Attleboro	22,621	313	–	38	–	324	–	1	–	321	–	161	–	11	–	288	–
44	North Adams	22,230	2	–	29	–	7	–	2	–	29	–	8	–	22	–	1,047	1
45	West Springfield	21,500	335	–	24	–	59	–	14	–	717	–	7	–	57	–	526	1
46	Westfield	20,963	115	–	5	–	18	–	6	–	167	–	6	–	3	–	154	–
47	Wakefield	20,845	50	–	14	–	293	–	4	–	91	–	28	–	300	–	39	–
48	Winthrop	20,422	144	–	88	–	341	1	27	–	211	–	57	–	443	–	372	–
49	Gardner	20,300	71	–	149	1	3	–	–	–	68	–	108	–	5	–	47	–
50	Woburn	19,976	239	–	48	–	8	–	132	–	3	–	7	–	59	–	21	–
51	Wellesley	19,720	757	1	151	–	178	–	26	–	167	–	217	–	120	–	73	–
52	Saugus	18,267	74	–	15	–	99	–	9	–	138	–	12	–	86	–	84	–
53	Southbridge	18,217	82	1	13	–	194	–	–	–	40	–	9	–	60	–	310	–
54	Greenfield	18,182	14	–	286	–	22	–	8	–	212	–	37	–	441	–	59	–
55	Dedham	17,644	8	–	18	–	73	–	42	–	128	–	3	–	73	1	90	–
56	Natick	17,505	1,110	1	87	–	48	–	39	–	139	–	324	–	168	–	286	–
57	Norwood	17,493	6	–	2	–	10	–	155	–	12	–	11	–	8	–	12	–
58	Needham	16,307	147	–	465	–	54	–	14	–	52	–	277	–	87	–	651	1
59	Milford	16,147	8	–	382	–	10	–	13	–	77	–	136	1	3	–	126	–
60	Marlborough	16,132	5	–	10	–	387	1	6	–	72	–	169	1	64	–	72	–
61	Lexington	15,536	87	–	45	–	51	–	90	–	285	–	4	–	96	–	26	–
62	Winchester	15,481	653	–	37	–	239	–	21	–	54	–	4	–	423	–	16	–
63	Danvers	15,025	13	–	10	–	100	–	15	–	58	–	2	–	9	–	21	–
64	Newburyport	14,223	575	–	24	–	74	–	36	–	154	–	6	–	157	–	11	–
65	Marblehead	13,964	470	2	35	–	137	1	18	–	165	–	16	–	173	–	14	–
66	Plymouth	13,943	5	–	170	–	14	–	3	–	37	–	13	–	11	–	45	–
67	Webster	13,826	2	–	59	–	2	–	–	–	181	1	–	–	156	–	4	–
68	Reading	13,637	11	–	13	–	176	–	5	–	73	–	5	–	174	1	77	–
69	Stoneham	13,116	16	–	109	–	58	–	49	–	123	–	12	–	209	–	139	–
70	Fairhaven	13,072	–	–	1	–	–	–	1	–	–	–	1	–	–	–	–	–
71	Clinton	12,991	–	–	109	–	6	–	3	–	71	–	2	–	9	–	111	–
72	Adams	12,821	3	–	206	–	14	–	–	–	11	–	6	–	10	–	378	–
73	Swampscott	12,781	203	–	124	–	183	–	9	–	132	–	15	–	237	–	68	–
74	Andover	12,620	76	–	70	–	33	–	23	–	181	–	3	–	55	–	238	–
75	North Attleboro	12,601	74	–	–	–	78	–	7	–	74	–	100	1	4	–	130	–
76	Athol	12,351	4	–	107	–	–	–	3	–	27	–	60	1	44	–	140	–
77	Hingham	11,132	20	–	85	–	17	–	7	–	202	–	116	–	69	–	270	–
78	Easthampton	10,830	46	–	8	–	67	–	3	–	18	–	89	–	12	–	67	–
79	Amesbury	10,824	414	–	7	–	34	–	96	–	128	1	2	–	132	–	6	–
80	Shrewsbury	10,791	1	–	9	–	45	–	14	–	55	–	8	–	107	–	57	–
81	Dartmouth	10,712	118	–	124	–	38	–	11	–	57	–	98	–	7	–	169	–
82	Northbridge	10,212	–	–	–	–	1	–	1	–	52	–	92	–	4	–	46	–
83	Palmer	10,211	19	–	545	–	5	–	4	–	28	–	44	–	74	–	42	–
84	Middleborough	10,099	3	–	246	–	95	–	–	–	4	–	86	–	–	–	–	–
85	Stoughton	9,470	241	–	18	–	2	–	–	–	39	–	44	–	8	–	2	–
86	Chelmsford	9,268	3	–	13	–	56	–	–	–	9	–	2	–	34	–	25	–
87	Walpole	9,258	12	–	10	–	44	–	123	2	9	–	28	–	32	–	10	–
88	Randolph	9,210	–	–	–	–	–	–	–	–	41	–	3	–	26	–	5	–
89	Rockland	9,053	–	–	2	–	3	–	–	–	8	–	80	–	4	–	3	–
90	Billerica	9,001	9	–	96	–	24	–	2	–	43	–	2	–	125	1	13	–
91	Auburn	8,958	2	–	236	–	1	–	46	–	49	–	16	–	48	–	229	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	CITIES AND TOWNS IN ORDER OF POPULATION	Population Estimated as of July 1, 1949	MEASLES															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
92	Barnstable	8,943	5	–	68	–	31	–	7	–	22	–	146	–	13	1	88	–
93	Agawam	8,915	54	–	48	–	32	–	3	–	104	–	4	–	57	–	140	–
94	Concord	8,743	33	–	122	–	81	–	2	–	32	–	7	–	206	–	3	–
95	Whitman	8,740	3	–	11	–	9	–	–	–	11	–	64	–	1	–	–	–
96	Bridgewater	8,641	7	–	96	–	4	–	1	–	19	1	108	–	3	–	3	–
97	Falmouth	8,489	19	–	219	1	3	–	6	–	84	–	25	–	88	–	23	–
98	Grafton	8,425	1	–	53	–	–	–	10	–	57	–	14	–	23	–	146	–
99	Wareham	8,392	–	–	17	–	1	–	2	–	54	–	10	–	1	–	17	–
100	North Andover	8,286	53	–	31	–	34	–	4	–	201	–	1	–	12	–	191	–
101	Millbury	8,268	14	–	176	–	2	–	45	–	163	–	10	–	358	–	78	–
102	Hudson	8,171	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
103	Ludlow	8,065	204	–	20	–	3	–	2	–	46	–	–	–	145	–	175	–
104	South Hadley	7,809	6	–	7	–	52	–	–	–	1	–	15	–	4	–	90	–
105	Franklin	7,735	4	–	105	–	18	–	9	–	105	–	13	–	1	–	24	–
106	Amherst	7,696	9	–	39	–	100	–	–	–	5	–	5	–	111	–	113	–
107	Somerset	7,668	23	–	37	–	10	–	–	–	–	1	1	–	17	–	27	–
108	Montague	7,602	3	–	69	–	5	–	2	–	44	–	9	–	75	–	8	–
109	Ware	7,578	5	–	196	–	5	–	3	–	55	–	–	–	6	–	12	–
110	Dracut	7,524	–	–	4	–	–	–	2	–	33	–	3	–	31	–	19	–
111	Mansfield	7,380	45	–	66	–	1	–	3	–	45	–	156	–	29	–	80	–
112	Maynard	7,198	1	–	4	–	55	–	2	–	4	–	2	–	56	–	2	–
113	Canton	7,010	3	–	7	–	5	–	1	–	52	–	5	–	53	–	7	–
114	Abington	6,963	1	–	11	–	22	–	3	–	79	–	58	–	9	–	–	–
115	Longmeadow	6,957	32	–	14	–	19	–	–	–	70	–	11	–	12	–	186	–
116	Westborough	6,866	1	–	133	–	3	–	3	–	8	–	104	–	10	–	124	–
117	Ipswich	6,857	60	–	10	–	65	–	39	–	15	–	–	–	72	–	10	–
118	Spencer	6,856	2	–	84	–	5	–	8	–	104	–	–	–	83	–	147	–
119	Uxbridge	6,836	3	–	97	–	6	–	10	–	53	–	95	–	–	–	181	–
120	Foxborough	6,627	8	1	56	–	20	–	5	–	177	–	15	–	19	–	144	–
121	Great Barrington	6,581	3	–	21	–	8	–	3	–	208	–	1	–	10	–	134	–
122	Winchendon	6,461	8	–	168	1	1	–	112	–	5	–	11	–	21	–	196	–
123	Wilmington	6,377	1	–	23	–	–	–	–	–	17	–	–	–	18	–	–	–
124	Swansea	6,319	65	1	18	–	18	–	–	–	–	–	9	–	15	–	37	–
125	Easton	6,223	124	–	6	–	6	–	2	–	55	–	41	–	4	–	1	–
126	Westwood	6,053	1	–	2	–	24	–	32	–	17	–	2	–	23	–	38	–
127	Tewksbury	5,949	10	–	9	–	–	–	–	–	18	–	4	–	38	–	–	–
128	Orange	5,907	10	–	73	–	–	–	4	–	14	–	9	–	7	–	111	–
129	Monson	5,713	32	–	67	–	–	–	–	–	–	–	1	–	177	–	47	–
130	Holden	5,648	–	–	16	–	2	–	19	–	147	–	–	–	77	–	169	–

131	Seekonk	5,552	2	–	–	–	3	–	–	–	3	–	11	–	3	–	14	1	–
132	Scituate	5,526	2	–	11	–	14	–	5	–	110	–	34	–	6	–	8	–	–
133	Wrentham	5,437	44	–	12	–	219	–	1	–	12	–	72	–	34	–	17	–	–
134	Leicester	5,409	–	–	1	–	–	–	–	–	–	–	9	–	4	–	2	–	–
135	Oxford	5,368	16	–	133	–	3	–	10	–	137	–	16	–	44	–	88	–	–
136	Westport	5,297	57	–	36	–	6	–	1	–	31	–	28	–	79	–	104	–	–
137	Weston	5,241	45	–	38	–	160	–	7	–	20	–	19	–	65	–	7	–	–
138	Williamstown	4,919	1	–	229	–	4	–	–	–	8	–	4	–	25	–	137	–	–
139	Dudley	4,816	–	–	–	–	–	–	–	–	–	–	–	–	–	–	7	–	–
140	Dalton	4,517	–	–	1	–	9	–	–	–	–	–	2	–	49	–	–	–	–
141	Bedford	4,486	61	–	14	–	30	–	2	–	5	–	2	–	16	–	3	–	–
142	Lee	4,444	88	–	173	–	5	–	1	–	20	–	85	–	27	–	82	–	–
143	Hull	4,437	4	–	1	–	–	–	2	–	23	–	13	–	8	–	56	–	–
144	Templeton	4,435	–	–	34	–	–	–	–	–	51	–	1	1	7	–	16	–	–
145	Rockport	4,403	5	–	70	–	4	–	–	–	57	–	2	–	2	–	15	–	–
146	Sharon	4,379	4	–	20	–	17	–	3	–	44	–	64	–	49	–	7	–	–
147	Acushnet	4,370	–	–	2	–	–	–	–	–	–	–	5	–	–	–	1	–	–
148	Blackstone	4,349	–	–	–	–	1	–	–	–	–	–	4	–	–	–	3	–	–
149	Ayer	4,328	11	–	280	2	6	–	1	–	14	–	24	–	33	–	263	–	–
150	Wayland	4,262	–	–	–	–	–	–	–	–	1	–	32	–	4	–	–	–	–
151	Medfield	4,199	1	–	6	–	3	–	–	–	8	–	96	–	–	–	3	–	–
152	East Longmeadow	4,163	17	–	8	–	27	–	–	–	13	–	5	–	2	–	77	–	–
153	East Bridgewater	4,158	4	–	68	–	13	–	–	–	57	–	217	–	1	–	1	–	–
154	Holbrook	4,056	12	–	65	–	6	–	–	–	12	–	53	–	38	–	7	–	–
155	Belchertown	4,021	16	–	16	–	9	–	106	–	16	–	12	–	19	–	6	–	–
156	Cohasset	3,947	–	–	88	–	–	–	–	–	15	–	12	–	59	–	46	–	–
157	Bellingham	3,935	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
158	West Bridgewater	3,905	19	–	40	–	15	–	2	–	71	–	58	–	15	–	5	–	–
159	Westford	3,815	3	–	78	–	73	–	3	–	6	–	1	–	32	–	65	–	–
160	Bourne	3,716	–	–	9	–	6	–	2	–	15	–	100	–	9	–	36	–	–
161	Holliston	3,582	25	–	21	–	–	–	1	–	9	–	38	–	3	–	3	–	–
162	Provincetown	3,564	2	–	5	–	–	–	–	–	71	–	25	–	1	–	17	–	–
163	Hopedale	3,518	1	–	38	–	2	–	2	–	5	–	32	–	–	–	1	–	–
164	Charlton	3,507	–	–	–	–	–	–	–	–	–	–	16	–	–	–	24	–	–
165	Warren	3,498	36	–	149	–	–	–	–	–	43	–	–	–	13	–	179	–	–
166	Barre	3,485	4	–	43	–	1	–	1	–	69	–	9	–	15	–	96	–	–
167	Lynnfield	3,476	57	–	4	–	114	–	1	–	19	–	2	–	120	–	11	–	–
168	Northboro	3,450	–	–	–	–	–	–	–	–	–	–	48	–	2	–	15	–	–
169	Wilbraham	3,442	36	–	28	–	8	–	2	–	50	–	2	–	43	–	12	–	–
170	Deerfield	3,422	–	–	39	–	1	–	–	–	39	–	–	–	21	–	44	–	–
171	Medway	3,397	2	–	1	–	–	–	2	–	25	–	37	–	6	–	2	–	–
172	Ashland	3,326	37	–	56	–	4	–	74	–	4	–	–	–	2	–	–	–	–
173	Rehoboth	3,282	–	–	–	–	–	–	–	–	–	–	13	–	–	–	10	–	–
174	North Reading	3,270	4	–	2	–	51	–	1	1	11	–	–	–	71	–	17	–	–
175	Hanover	3,168	1	–	14	–	–	–	1	–	35	–	9	–	–	–	1	–	–
176	North Brookfield	3,121	2	–	59	–	4	–	15	–	28	–	2	–	–	–	–	–	–
177	Pepperell	3,119	–	–	–	–	23	–	–	–	43	–	3	–	3	–	19	–	–
178	Groton	3,106	49	–	73	–	16	–	–	–	–	–	–	–	6	–	25	–	–
179	Norton	3,096	40	–	9	–	14	–	2	–	–	–	–	–	–	–	3	–	–
180	Lancaster	3,092	2	–	75	–	13	–	2	–	111	–	2	–	8	–	120	–	–
181	Dighton	3,070	–	–	1	–	3	–	–	–	4	–	–	–	3	–	1	–	–
182	Lunenburg	3,058	1	–	72	–	–	–	2	–	23	–	14	–	35	–	35	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	MEASLES															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
183	Kingston	3,018	–	–	50	–	–	–	–	–	7	–	1	–	44	–	5	–
184	Burlington	3,017	29	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–
185	Acton	3,004	–	–	15	–	12	–	–	–	2	–	4	–	120	–	–	–
186	Lenox	3,000	13	–	2	–	–	–	–	–	2	–	3	–	4	–	22	–
187	Hopkinton	2,991	106	–	80	–	4	–	6	–	25	–	111	–	7	–	15	–
188	Nahant	2,890	13	–	1	–	9	–	4	–	32	–	–	–	49	–	–	–
189	West Boylston	2,874	2	–	53	–	–	–	3	–	33	–	–	–	37	–	113	–
190	Nantucket	2,870	9	–	32	–	–	–	–	–	1	–	–	–	2	–	1	–
191	Salisbury	2,828	102	–	6	–	4	–	78	–	10	–	–	–	21	–	1	–
192	Douglas	2,722	–	–	110	–	–	–	–	–	–	–	13	–	14	–	49	–
193	Avon	2,703	–	–	40	–	1	–	–	–	4	–	60	–	1	–	–	–
194	Hamilton	2,696	7	–	20	–	27	–	1	–	5	–	–	–	5	–	71	–
195	Hanson	2,695	1	–	18	–	5	–	1	–	6	–	56	–	3	–	4	–
196	Hadley	2,656	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
197	Sutton	2,610	2	–	56	–	1	–	2	–	18	–	5	–	42	–	24	–
198	Yarmouth	2,608	–	–	14	–	3	–	1	–	2	–	17	–	14	–	2	–
199	Manchester	2,580	–	–	13	–	68	–	2	–	19	–	–	–	16	–	107	–
200	Duxbury	2,486	1	–	–	–	–	–	4	–	16	–	18	–	–	–	–	–
201	Townsend	2,479	1	–	61	–	1	–	1	–	3	–	14	–	–	–	87	–
202	Upton	2,479	1	–	88	–	1	–	1	–	5	–	50	–	3	–	13	–
203	Shirley	2,459	1	–	170	–	3	–	–	–	19	–	–	–	3	–	52	–
204	Middleton	2,456	1	–	–	–	8	1	–	–	3	–	–	–	1	–	–	–
205	Merrimac	2,425	58	–	24	–	5	–	39	–	14	–	21	–	49	–	10	–
206	Southboro	2,421	38	–	22	–	27	–	1	–	31	–	19	–	11	–	97	–
207	Sturbridge	2,420	4	–	9	–	3	–	–	–	8	–	9	–	2	–	42	–
208	Marshfield	2,405	3	–	3	–	2	–	1	–	11	–	–	–	1	–	–	–
209	Norwell	2,393	–	–	–	–	10	–	1	–	3	–	22	–	–	–	5	–
210	Ashburnham	2,380	4	–	42	–	2	–	–	–	48	–	26	–	1	–	42	–
211	Millis	2,363	–	–	11	–	–	–	2	–	23	–	11	–	16	–	7	–
212	Mattapoisett	2,347	–	1	8	–	27	–	15	–	93	–	46	–	2	–	17	–
213	Sudbury	2,322	–	–	3	–	7	–	–	–	29	–	6	–	29	–	–	–
214	Plainville	2,278	–	–	–	–	6	–	–	–	2	–	37	–	1	–	40	–
215	Raynham	2,263	4	–	–	–	–	–	–	–	2	–	1	–	1	–	4	–
216	Chatham	2,241	–	–	–	–	–	–	1	–	66	–	4	–	1	–	4	–
217	Marion	2,216	4	–	61	–	73	–	3	–	12	–	57	–	1	–	12	–
218	Hatfield	2,188	3	–	–	–	12	–	–	–	6	–	7	–	7	–	39	–
219	Lincoln	2,179	9	–	1	–	–	–	–	–	12	–	–	–	–	–	–	–
220	Northfield	2,162	4	–	168	1	23	–	–	–	13	–	13	–	42	–	67	–
221	Westminster	2,153	–	–	4	–	6	–	–	–	45	–	1	–	–	–	68	–

222	Groveland	2,150	9	–	49	–	–	–	76	–	20	–	1	–	13	–	2	–
223	Southwick	2,141	6	–	–	–	14	–	–	–	3	–	–	–	1	–	13	–
224	Georgetown	2,122	5	–	18	–	2	–	1	–	1	–	–	–	7	–	1	–
225	Hardwick	2,115	–	–	133	–	–	–	–	–	19	–	3	–	1	–	57	–
226	Harwich	2,071	–	–	1	–	–	–	–	–	–	–	2	–	–	–	–	–
227	Sterling	2,043	1	–	86	–	1	–	–	–	17	–	9	–	20	–	52	–
228	Freetown	2,027	7	1	–	–	3	–	–	–	–	–	–	–	–	–	14	–
229	Norfolk	2,006	8	–	8	–	25	–	2	–	22	–	2	–	–	–	1	–
230	Williamsburg	1,980	5	–	1	–	64	–	2	–	3	–	5	–	43	–	–	–
231	Pembroke	1,917	–	–	–	–	–	–	–	–	54	–	–	–	–	–	–	–
232	Dennis	1,807	–	–	1	–	4	–	2	–	5	–	18	–	2	–	–	–
233	Sheffield	1,801	1	–	2	–	1	–	1	–	124	–	–	–	4	–	5	–
234	Lanesborough	1,754	–	–	–	–	10	–	–	–	3	–	–	–	10	–	13	–
235	Stockbridge	1,739	1	–	8	–	7	–	–	–	–	–	4	–	–	–	–	–
236	Dover	1,736	22	–	61	–	–	–	1	–	–	–	8	–	–	–	20	–
237	Tisbury	1,719	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
238	Cheshire	1,718	–	–	6	–	2	–	–	–	–	–	–	–	36	–	3	–
239	Essex	1,705	2	–	12	–	–	–	–	–	11	–	–	–	–	–	–	–
240	Newbury	1,677	1	–	–	–	3	–	–	–	–	–	–	–	8	–	1	–
241	Littleton	1,673	–	–	156	–	21	–	–	–	6	–	4	–	1	–	81	–
242	Sandwich	1,671	–	–	1	–	–	–	–	–	–	–	13	–	1	–	30	–
243	Shelburne	1,656	–	–	–	–	–	–	–	–	24	–	–	–	–	–	–	–
244	Mendon	1,650	–	–	2	–	15	–	–	–	–	–	–	–	–	–	–	–
245	Orleans	1,642	4	–	26	–	106	–	–	–	1	–	6	–	4	–	1	–
246	Rowley	1,626	–	–	–	–	2	–	–	–	8	–	1	–	2	–	8	–
247	Millville	1,616	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
248	Rutland	1,561	–	–	–	–	–	–	–	–	–	–	–	–	–	–	121	–
249	Lakeville	1,555	1	–	7	–	16	–	–	–	–	–	37	1	–	–	–	–
250	Wenham	1,550	6	–	–	–	33	–	–	–	33	–	1	–	13	–	2	–
251	Buckland	1,525	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
252	West Brookfield . .	1,512	1	–	24	–	5	–	–	–	4	–	–	–	7	–	110	–
253	West Newbury . . .	1,503	–	–	7	–	1	–	2	1	5	–	1	–	5	–	–	–
254	Tyngsborough . . .	1,495	–	–	4	–	1	–	–	–	41	–	–	–	22	–	–	–
255	Colrain	1,455	–	–	–	–	3	–	–	–	16	–	–	–	35	–	28	–
256	Clarksburg	1,450	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
257	Stow	1,427	3	–	–	–	100	–	3	–	1	–	–	–	55	–	3	–
258	Brookfield	1,390	18	–	13	–	1	–	1	–	74	–	1	–	9	–	70	–
259	Carver	1,383	–	–	–	–	1	–	–	–	–	–	2	–	–	–	–	–
260	Oak Bluffs	1,345	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
261	Hinsdale	1,325	–	–	–	–	–	–	–	–	–	–	8	–	18	–	–	–
262	Erving	1,315	–	–	18	–	1	–	–	–	5	–	8	–	–	–	1	–
263	Boylston	1,313	–	–	1	–	–	–	–	–	3	–	–	–	50	–	59	–
264	Edgartown	1,296	–	–	39	–	7	–	–	–	1	–	–	–	–	–	–	–
265	Hampden	1,256	1	–	–	–	10	–	–	–	1	–	–	–	–	–	21	–
266	Southampton	1,254	–	–	–	–	–	–	–	–	15	–	–	–	28	–	4	–
267	Chester	1,252	2	–	1	–	–	–	–	–	–	–	–	–	1	–	8	–
268	Huntington	1,242	4	–	15	–	–	–	–	–	–	–	2	–	4	–	8	–
269	Berkley	1,231	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
270	Russell	1,221	1	–	1	–	2	–	–	–	21	–	4	–	–	–	96	–
271	Granby	1,193	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
272	Berlin	1,174	–	–	14	–	–	–	1	–	–	–	1	–	3	–	61	–
273	Ashby	1,155	–	–	22	–	–	–	–	–	–	–	9	–	–	–	6	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	CITIES AND TOWNS IN ORDER OF POPULATION	Population Estimated as of July 1, 1949	MEASLES															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
274	Topsfield	1,153	1	–	2	–	1	–	1	–	53	–	1	–	7	–	3	–
275	East Brookfield	1,125	–	–	25	–	1	–	1	–	9	–	1	–	44	–	31	–
276	Rochester	1,107	–	–	–	–	–	–	–	–	–	–	–	–	–	–	19	–
277	Halifax	1,093	1	–	–	–	–	–	–	–	2	–	23	–	–	–	–	–
278	Bernardston	1,070	–	–	1	1	14	–	–	–	15	–	9	–	8	–	12	–
279	Harvard	1,065	–	–	78	–	–	–	1	–	7	–	–	–	1	–	2	–
280	West Stockbridge	1,059	–	–	21	–	–	–	–	–	–	–	–	–	4	–	5	–
281	Sherborn	1,036	13	–	19	–	–	–	1	–	2	–	–	–	–	–	–	–
282	Hubbardston	1,019	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
283	Sunderland	1,018	–	–	1	–	5	–	–	–	3	–	–	–	7	–	–	–
284	Princeton	1,012	–	–	8	–	1	–	1	–	10	–	6	–	5	–	62	–
285	Ashfield	981	–	–	10	–	2	–	–	–	3	–	2	–	–	–	1	–
286	Brimfield	975	–	–	–	–	–	–	–	–	–	–	–	–	2	–	18	–
287	Whately	973	2	–	–	–	–	–	–	–	–	–	–	–	–	–	9	–
288	Gill	918	1	–	10	–	1	–	–	–	–	–	–	–	–	–	–	–
289	Bolton	905	1	–	8	–	5	–	–	–	–	–	–	–	–	–	11	–
290	Paxton	905	9	–	50	–	–	–	–	–	–	–	–	–	7	–	57	–
291	New Marlboro	896	1	–	–	–	–	–	–	–	23	–	1	–	17	–	1	–
292	Conway	867	–	–	7	–	–	–	–	–	–	–	–	–	–	–	–	–
293	Boxford	852	4	–	–	–	6	–	3	–	–	–	–	–	1	–	–	–
294	Wellfleet	851	–	–	2	–	1	–	2	–	1	–	24	–	–	–	–	–
295	Charlemont	812	–	–	–	–	–	–	–	–	–	–	–	–	–	–	21	–
296	Brewster	757	–	–	–	–	16	–	–	–	–	–	–	–	1	–	2	–
297	Royalston	750	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
298	Petersham	743	2	–	19	–	4	–	1	–	6	–	16	–	2	–	3	–
299	Carlisle	697	–	–	–	–	–	–	–	–	–	–	1	–	1	–	4	–
300	Becket	682	–	–	1	–	1	–	–	–	–	–	–	–	1	–	–	–
301	Egremont	660	–	–	4	–	–	–	–	–	38	–	–	–	4	–	1	–
302	Granville	656	2	–	–	–	1	–	–	–	11	–	–	–	–	–	–	–
303	Richmond	646	–	–	2	–	1	–	–	–	7	–	–	–	40	–	8	–
304	Eastham	604	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
305	Leverett	594	–	–	1	–	17	–	–	–	–	–	1	–	5	–	14	–
306	Truro	582	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
307	Blandford	572	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
308	Plympton	545	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
309	Cummington	532	–	–	4	–	25	–	–	–	–	–	–	–	–	–	4	–
310	Pelham	512	1	–	1	–	3	–	–	–	–	–	–	–	–	–	–	–
311	Phillipston	475	–	–	–	–	–	–	–	–	2	–	19	–	–	–	5	–
312	Dunstable	440	9	–	14	–	–	–	–	–	4	–	–	–	–	–	–	–

313	Oakham	424	–	–	–	–	–	–	–	–	3	–	–	–	2	–	–	–
314	Westhampton	413	–	–	–	–	8	–	–	–	1	–	–	–	2	–	5	–
315	New Braintree	409	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
316	Florida	401	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
317	Warwick	401	–	–	6	–	–	–	–	–	–	–	–	–	–	–	3	–
318	Otis	377	7	–	2	–	2	–	1	–	5	–	–	–	1	–	5	–
319	Chesterfield	375	–	–	–	–	20	–	13	–	3	–	5	–	22	–	6	–
320	Sandisfield	370	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
321	New Salem	364	–	–	–	–	–	–	–	–	4	–	14	–	–	–	–	–
322	Worthington	363	2	–	–	–	3	–	–	–	20	–	12	–	6	–	1	–
323	Boxborough	358	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
324	Wales	354	–	–	16	–	–	–	–	–	6	–	–	–	–	–	–	–
325	Hancock	349	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
326	Wendell	348	1	–	–	–	–	–	–	–	–	–	–	–	2	–	2	–
327	Mashpee	343	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
328	Goshen	328	–	–	–	–	3	–	–	–	1	–	1	–	–	–	–	–
329	Heath	327	1	–	22	–	2	–	–	–	6	–	3	–	15	–	10	–
330	Monterey	305	–	–	–	–	–	–	–	–	5	–	1	–	–	–	4	–
331	Savoy	294	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
332	Windsor	274	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
333	Holland	265	1	–	5	–	–	–	–	–	22	–	–	–	–	–	–	–
334	Leyden	254	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
335	Washington	242	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–
336	West Tisbury	239	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
337	Chilmark	230	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
338	Middlefield	226	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–
339	Plainfield	224	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
340	Tyringham	211	1	–	15	–	–	–	–	–	–	–	–	–	–	1	–	–
341	Alford	207	–	–	6	–	–	–	–	–	17	–	–	–	1	–	–	–
342	Hawley	203	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
343	Shutesbury	201	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
344	Rowe	178	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
345	Monroe	171	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
346	Montgomery	137	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
347	Peru	116	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
348	Gay Head	114	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
349	Tolland	111	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
350	Gosnold	107	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
351	New Ashford	99	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
352	Mt. Washington	53	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
353	Tewksbury State Hospital		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
354	Military Establishments		124	–	346	–	101	–	48	–	6	–	–	–	–	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities*

Line No.	CITIES AND TOWNS IN ORDER OF POPULATION	Population Estimated as of July 1, 1949	MUMPS															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
1	Massachusetts	4,660,546	15,898	2	7,087	1	11,034	1	15,727	1	5,810	–	8,389	1	17,037	2	10,182	–
2	Boston	766,386	2,450	–	1,149	–	2,254	–	2,542	–	465	–	1,453	–	3,056	–	758	–
3	Worcester	203,171	85	–	617	–	1,096	–	137	–	324	–	1,484	–	372	–	477	–
4	Springfield	168,955	350	–	376	–	115	–	437	–	267	–	69	–	802	–	162	–
5	Fall River	115,062	238	–	9	–	18	–	591	–	52	–	29	–	108	–	693	–
6	Cambridge	111,305	576	–	347	–	186	–	509	–	449	–	322	–	1,106	–	200	–
7	Lynn	111,305	1,159	–	24	–	103	–	598	1	13	–	119	–	974	–	123	–
8	New Bedford	110,308	65	–	99	–	18	–	264	–	34	–	23	–	27	–	538	–
9	Somerville	109,135	97	–	67	–	48	–	201	–	20	–	50	–	255	–	30	–
10	Lowell	101,229	96	–	4	–	7	–	105	–	36	–	8	–	77	–	29	–
11	Quincy	87,584	682	–	158	–	66	–	549	–	84	–	293	–	964	–	190	–
12	Lawrence	86,714	56	–	4	–	2	–	94	–	11	–	23	–	44	–	161	–
13	Newton	83,715	637	1	78	–	447	–	488	–	55	–	177	–	368	–	268	–
14	Medford	70,548	100	1	155	–	59	–	179	–	47	–	133	–	188	–	43	–
15	Brockton	67,706	97	–	12	–	54	–	328	–	13	–	64	–	86	–	134	–
16	Brookline	63,221	71	–	31	–	220	–	263	–	31	–	204	–	250	–	49	–
17	Malden	60,922	413	–	220	–	50	–	507	–	30	–	234	–	375	–	135	–
18	Pittsfield	56,931	246	–	29	–	280	–	12	–	467	–	10	–	35	–	174	–
19	Holyoke	53,775	46	–	2	–	24	–	43	–	25	–	4	–	29	–	123	–
20	Everett	50,088	43	–	2	–	62	–	83	–	10	–	32	–	55	–	34	–
21	Chicopee	47,219	66	–	3	–	12	–	58	–	29	–	18	–	49	–	20	–
22	Waltham	46,693	163	–	5	–	21	–	124	–	11	–	46	–	213	–	10	–
23	Arlington	46,541	377	–	278	–	109	–	181	–	84	–	100	–	284	–	243	–
24	Haverhill	46,162	100	–	15	–	172	–	217	–	5	–	17	–	133	1	145	–
25	Fitchburg	45,447	14	–	19	–	2	–	9	–	31	–	3	–	64	–	23	–
26	Salem	44,232	73	–	1	–	24	–	56	–	6	–	6	–	186	–	14	–
27	Chelsea	39,940	14	–	4	–	174	–	36	–	2	–	14	–	91	–	18	–
28	Taunton	39,661	–	–	1	–	–	–	5	–	6	–	37	–	6	–	5	–
29	Watertown	39,199	133	–	13	–	34	–	221	–	30	–	61	–	77	–	78	–
30	Revere	36,805	7	–	13	–	33	–	70	–	3	–	1	–	44	–	7	–
31	Weymouth	31,556	17	–	16	–	3	–	8	–	2	–	14	–	58	–	5	–
32	Belmont	30,627	135	–	61	–	171	–	335	–	104	–	149	–	227	–	35	–
33	Melrose	30,274	76	–	18	–	152	–	155	–	2	–	70	–	310	–	7	–
34	Beverly	27,925	102	–	1	–	2	–	13	–	15	–	12	–	43	–	13	–
35	Framingham	27,489	106	–	37	–	349	–	191	–	7	–	13	–	237	–	301	–
36	Gloucester	25,562	35	–	–	–	4	–	15	–	6	–	1	–	51	–	22	–
37	Northampton	25,129	842	–	5	–	59	–	91	–	105	–	8	–	224	–	313	–
38	Leominster	24,697	5	–	14	–	12	–	5	–	60	–	2	–	60	–	60	–
39	Milton	24,366	266	–	68	–	65	–	261	–	12	–	82	–	201	–	31	–

40	Methuen	24,271	70	–	1	–	41	–	76	–	6	–	10	–	59	–	206	–	–	–	–	–	–
41	Braintree	23,675	200	–	132	–	62	–	48	–	32	–	60	–	282	–	26	–	–	–	–	–	–
42	Peabody	22,797	111	–	2	–	2	–	8	–	1	–	3	–	55	–	1	–	–	–	–	–	–
43	Attleboro	22,621	55	–	46	–	233	–	13	–	2	–	4	–	198	–	120	–	–	–	–	–	–
44	North Adams	22,230	9	–	–	–	–	–	4	–	36	–	77	–	2	–	2	–	–	–	–	–	–
45	West Springfield	21,500	14	–	9	–	9	–	552	–	18	–	5	–	162	–	205	–	–	–	–	–	–
46	Westfield	20,963	42	–	17	–	2	–	46	–	7	–	1	–	58	–	50	–	–	–	–	–	–
47	Wakefield	20,845	2	–	8	–	63	–	11	–	6	–	61	–	42	–	19	–	–	–	–	–	–
48	Winthrop	20,422	213	–	57	–	25	–	304	–	8	–	104	–	338	–	22	–	–	–	–	–	–
49	Gardner	20,300	25	–	21	–	2	–	–	–	14	–	9	–	4	–	44	–	–	–	–	–	–
50	Woburn	19,976	5	–	27	–	6	–	4	–	2	–	3	–	19	–	5	–	–	–	–	–	–
51	Wellesley	19,720	256	–	112	–	530	–	66	–	14	–	136	–	53	–	115	–	–	–	–	–	–
52	Saugus	18,267	98	–	12	–	11	–	53	–	7	–	54	–	26	–	2	–	–	–	–	–	–
53	Southbridge	18,217	31	–	1	–	6	–	20	–	30	–	1	–	6	–	64	–	–	–	–	–	–
54	Greenfield	18,182	286	–	5	–	4	–	50	–	112	–	4	–	67	–	33	–	–	–	–	–	–
55	Dedham	17,644	62	–	–	–	2	–	26	–	9	–	18	–	70	–	2	–	–	–	–	–	–
56	Natick	17,505	408	–	20	–	175	–	140	–	140	–	23	–	97	–	144	–	–	–	–	–	–
57	Norwood	17,493	11	–	9	–	3	–	4	–	1	–	2	–	16	–	10	–	–	–	–	–	–
58	Needham	16,307	420	–	11	–	357	–	258	–	3	–	98	–	36	–	86	–	–	–	–	–	–
59	Milford	16,147	15	–	13	–	–	–	9	–	10	–	179	–	19	–	6	–	–	–	–	–	–
60	Marlborough	16,132	3	–	2	–	3	–	24	–	5	–	1	–	25	–	69	–	–	–	–	–	–
61	Lexington	15,536	81	–	45	–	7	–	28	–	8	–	48	–	213	–	19	–	–	–	–	–	–
62	Winchester	15,481	15	–	188	–	27	–	114	–	10	–	29	–	115	–	57	–	–	–	–	–	–
63	Danvers	15,025	41	–	2	–	3	–	24	–	1	–	6	–	35	–	5	–	–	–	–	–	–
64	Newburyport	14,223	8	–	284	–	19	–	198	–	5	–	14	–	83	–	5	–	–	–	–	–	–
65	Marblehead	13,964	47	–	10	–	63	–	52	–	229	–	16	–	140	–	7	–	–	–	–	–	–
66	Plymouth	13,943	61	–	16	–	4	–	5	–	2	–	–	–	85	–	15	–	–	–	–	–	–
67	Webster	13,826	11	–	4	–	60	–	159	–	13	–	–	–	2	–	59	–	–	–	–	–	–
68	Reading	13,637	15	–	22	–	1	–	8	–	1	–	36	–	50	–	7	–	–	–	–	–	–
69	Stoneham	13,116	6	–	46	–	14	–	14	–	–	–	197	–	213	–	13	–	–	–	–	–	–
70	Fairhaven	13,072	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
71	Clinton	12,991	4	–	7	–	1	–	37	–	8	–	–	–	1	–	3	–	–	–	–	–	–
72	Adams	12,821	24	–	10	–	–	–	–	–	6	–	29	–	1	–	–	–	–	–	–	–	–
73	Swampscott	12,781	217	–	9	–	62	–	89	–	6	–	79	–	210	–	7	–	–	–	–	–	–
74	Andover	12,620	108	–	48	–	22	–	183	–	5	–	2	–	12	–	79	–	–	–	–	–	–
75	North Attleboro	12,601	2	–	–	–	8	–	15	–	4	–	19	–	59	–	11	–	–	–	–	–	–
76	Athol	12,351	5	–	–	–	1	–	17	–	12	–	1	–	19	–	13	–	–	–	–	–	–
77	Hingham	11,132	22	–	67	–	3	1	96	–	11	–	169	–	151	–	120	–	–	–	–	–	–
78	Easthampton	10,830	86	–	–	–	1	–	–	–	17	–	–	–	4	–	39	–	–	–	–	–	–
79	Amesbury	10,824	10	–	–	–	2	–	196	–	1	–	4	–	49	–	9	–	–	–	–	–	–
80	Shrewsbury	10,791	–	–	22	–	44	–	–	–	2	–	6	–	22	–	17	–	–	–	–	–	–
81	Dartmouth	10,712	–	–	71	–	–	–	85	–	22	–	1	–	4	–	30	–	–	–	–	–	–
82	Northbridge	10,212	4	–	1	–	–	–	–	–	31	–	5	–	1	–	7	–	–	–	–	–	–
83	Palmer	10,211	37	–	2	–	2	–	75	–	76	–	–	–	4	–	16	–	–	–	–	–	–
84	Middleborough	10,099	3	–	25	–	385	–	2	–	–	–	–	–	11	–	–	–	–	–	–	–	–
85	Stoughton	9,470	5	–	5	–	13	–	19	–	1	–	–	–	14	–	20	–	–	–	–	–	–
86	Chelmsford	9,268	9	–	1	–	3	–	14	–	2	–	1	–	23	–	–	–	–	–	–	–	–
87	Walpole	9,258	7	–	7	–	10	–	25	–	1	–	70	–	10	–	3	–	–	–	–	–	–
88	Randolph	9,210	–	–	–	–	–	–	–	–	–	–	–	–	5	–	4	–	–	–	–	–	–
89	Rockland	9,053	2	–	–	–	–	–	28	–	10	–	2	–	3	–	20	–	–	–	–	–	–
90	Billerica	9,001	12	–	4	–	11	–	3	–	4	–	–	–	29	–	3	–	–	–	–	–	–
91	Auburn	8,958	4	–	5	–	93	–	16	–	10	–	105	–	78	–	52	–	–	–	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	CITIES AND TOWNS IN ORDER OF POPULATION	Population Estimated as of July 1, 1949	MUMPS															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
92	Barnstable	8,943	84	–	10	–	1	–	2	–	1	–	13	–	161	–	84	–
93	Agawam	8,915	8	–	6	–	1	–	47	–	78	–	3	–	51	–	18	–
94	Concord	8,743	9	–	7	–	60	–	66	–	18	–	5	–	43	–	44	–
95	Whitman	8,740	–	–	–	–	–	–	12	–	2	–	13	–	–	–	–	–
96	Bridgewater	8,641	14	–	2	–	30	–	29	–	2	–	4	–	10	–	72	–
97	Falmouth	8,489	4	–	3	–	35	–	57	–	4	–	4	–	104	–	52	–
98	Grafton	8,425	1	–	10	–	–	–	12	–	3	–	3	–	37	–	14	–
99	Wareham	8,392	2	–	–	–	1	–	–	–	4	–	1	–	–	–	15	–
100	North Andover	8,286	36	–	–	–	47	–	95	–	–	–	2	–	35	–	92	–
101	Millbury	8,268	50	–	77	–	26	–	99	–	15	–	45	–	34	–	37	–
102	Hudson	8,171	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
103	Ludlow	8,650	49	–	5	–	1	–	245	–	32	–	1	–	29	–	87	–
104	South Hadley	7,809	3	–	4	–	37	–	–	–	20	–	1	–	2	–	4	–
105	Franklin	7,735	10	–	6	–	2	–	11	–	12	–	2	–	2	–	6	–
106	Amherst	7,696	59	–	7	–	11	–	49	–	15	–	1	–	6	–	59	–
107	Somerset	7,668	19	–	2	–	–	–	1	–	1	–	–	–	–	–	–	–
108	Montague	7,602	15	–	–	–	–	–	1	–	4	–	1	–	3	–	35	–
109	Ware	7,578	1	–	2	–	–	–	13	–	1	–	–	–	1	–	1	–
110	Dracut	7,524	1	–	–	–	2	–	24	–	1	–	10	–	1	–	3	–
111	Mansfield	7,380	21	–	6	–	35	–	2	–	3	–	5	–	31	–	43	–
112	Maynard	7,198	15	–	1	–	–	–	2	–	3	–	3	–	4	–	1	–
113	Canton	7,010	8	–	6	–	7	–	24	–	7	–	2	–	2	–	4	–
114	Abington	6,963	4	–	1	–	5	–	9	–	3	–	2	–	2	–	10	–
115	Longmeadow	6,957	19	–	17	–	82	–	16	–	9	–	3	–	75	–	2	–
116	Westborough	6,866	–	–	4	–	107	–	–	–	30	–	7	–	12	–	54	–
117	Ipswich	6,857	33	–	2	–	37	–	18	–	3	–	–	–	51	–	3	–
118	Spencer	6,856	43	–	–	–	1	–	35	–	111	–	2	–	5	–	11	–
119	Uxbridge	6,836	1	–	51	–	21	–	6	–	36	–	15	–	–	–	2	–
120	Foxborough	6,627	5	–	2	–	7	–	91	–	1	–	–	–	13	–	12	–
121	Great Barrington	6,581	7	–	80	–	128	–	6	–	4	–	2	–	70	–	1	–
122	Winchendon	6,461	4	–	76	–	10	–	4	–	48	–	1	–	26	–	7	–
123	Wilmington	6,377	–	–	–	–	–	–	–	–	–	–	1	–	7	–	–	–
124	Swansea	6,319	19	–	1	–	4	–	–	–	–	–	–	–	4	–	53	–
125	Easton	6,223	5	–	–	–	52	–	25	–	–	–	–	–	8	–	6	–
126	Westwood	6,053	–	–	–	–	2	–	3	–	1	–	5	–	20	–	7	–
127	Tewksbury	5,949	101	–	–	–	–	–	9	–	3	–	–	–	–	–	–	–
128	Orange	5,907	51	–	2	–	–	–	9	–	85	–	–	–	4	–	1	–
129	Monson	5,713	15	–	2	–	3	–	1	–	3	–	–	–	13	–	13	–
130	Holden	5,648	2	–	35	–	138	–	10	–	3	–	108	–	1	–	7	–

131	Seekonk	5,552	–	–	–	–	1	–	–	–	1	–	–	–	4	–	1	–
132	Scituate	5,526	–	–	2	–	–	–	3	–	11	–	3	–	16	–	10	–
133	Wrentham	5,437	114	–	67	–	6	–	17	–	3	–	87	–	15	–	8	–
134	Leicester	5,409	–	–	–	–	2	–	–	–	–	–	–	–	–	–	1	–
135	Oxford	5,368	41	–	1	–	30	–	17	–	16	–	10	–	–	–	10	–
136	Westport	5,297	17	–	–	–	–	–	67	–	1	–	2	–	–	–	62	–
137	Weston	5,241	15	–	13	–	13	–	20	–	4	–	171	–	5	–	15	–
138	Williamstown	4,919	41	–	–	–	–	–	2	–	18	–	52	–	–	–	2	–
139	Dudley	4,816	–	–	–	–	–	–	–	–	–	–	–	–	–	–	7	–
140	Dalton	4 517	2	–	1	–	–	–	–	–	1	–	–	–	2	–	28	–
141	Bedford	4,486	14	–	1	–	15	–	69	–	–	–	–	–	14	–	6	–
142	Lee	4,444	36	–	23	–	15	–	–	–	79	–	–	–	3	–	5	–
143	Hull	4,437	–	–	–	–	1	–	14	–	4	–	1	1	5	–	2	–
144	Templeton	4,435	1	–	–	–	–	–	3	–	1	–	4	–	5	–	8	–
145	Rockport	4,403	2	–	–	–	–	–	3	–	1	–	–	–	51	–	35	–
146	Sharon	4,379	2	–	2	–	14	–	4	–	1	–	9	–	4	–	41	–
147	Acushnet	4,370	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
148	Blackstone	4,349	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
149	Ayer	4,328	20	–	4	–	–	–	44	–	9	–	7	–	24	–	82	–
150	Wayland	4,262	–	–	–	–	1	–	1	–	–	–	3	–	2	–	1	–
151	Medfield	4,199	4	–	1	–	3	–	20	–	6	–	6	–	13	–	3	–
152	East Longmeadow	4,163	19	–	7	–	8	–	–	–	3	–	–	–	44	–	35	–
153	East Bridgewater	4,158	96	–	3	–	28	–	11	–	–	–	82	–	3	–	43	–
154	Holbrook	4,056	7	–	6	–	1	–	16	–	–	–	1	–	44	–	3	–
155	Belchertown	4,021	4	–	3	–	2	–	28	–	15	–	117	–	3	–	3	–
156	Cohasset	3,947	–	–	3	–	–	–	6	–	39	–	4	–	22	–	80	–
157	Bellingham	3,935	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
158	West Bridgewater	3,905	29	–	46	–	3	–	12	–	–	–	7	–	14	–	29	–
159	Westford	3,815	15	–	–	–	2	–	6	–	76	–	4	–	26	–	12	–
160	Bourne	3,716	3	–	1	–	60	–	4	–	3	–	2	–	7	–	63	–
161	Holliston	3,582	15	–	–	–	–	–	3	–	–	–	5	–	–	–	1	–
162	Provincetown	3,564	2	–	–	–	2	–	11	–	4	–	–	–	–	–	35	–
163	Hopedale	3,518	6	–	1	–	–	–	–	–	1	–	6	–	–	–	–	–
164	Charlton	3,507	1	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–
165	Warren	3,498	1	–	–	–	–	–	102	–	36	–	–	–	3	–	5	–
166	Barre	3,485	23	–	29	–	19	–	1	–	4	–	–	–	1	–	28	–
167	Lynnfield	3,476	6	–	4	–	42	–	36	–	–	–	1	–	7	–	6	–
168	Northboro	3,450	–	–	–	–	–	–	–	–	–	–	9	–	4	–	1	–
169	Wilbraham	3,442	47	–	3	–	1	–	8	–	24	–	12	–	74	–	30	–
170	Deerfield	3,422	30	–	3	–	4	–	1	–	–	–	–	–	–	–	–	–
171	Medway	3,397	–	–	–	–	–	–	3	–	8	–	2	–	–	–	4	–
172	Ashland	3,326	30	–	2	–	56	–	10	–	–	–	–	–	–	–	–	–
173	Rehoboth	3,282	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–
174	North Reading	3,270	6	–	2	–	–	–	–	–	–	–	1	–	4	–	3	–
175	Hanover	3,168	–	–	–	–	–	–	–	–	26	–	–	–	–	–	26	–
176	North Brookfield	3,121	9	–	1	–	–	–	37	–	4	–	1	–	–	–	–	–
177	Pepperell	3,119	–	–	–	–	2	–	1	–	8	–	–	–	5	–	21	–
178	Groton	3,106	8	–	2	–	2	–	44	–	–	–	1	–	2	–	11	–
179	Norton	3,096	–	–	1	–	1	–	–	–	–	–	1	–	–	–	–	–
180	Lancaster	3,092	17	–	54	–	6	–	83	–	46	–	1	–	7	–	2	–
181	Dighton	3,070	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
182	Lunenburg	3,058	3	–	–	–	–	–	1	–	3	–	–	–	3	–	2	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	MUMPS															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
183	Kingston	3,018	–	–	2	–	–	–	1	–	1	–	–	–	4	–	1	–
184	Burlington	3,017	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
185	Acton	3,004	2	–	–	–	3	–	16	–	25	–	–	–	3	–	–	–
186	Lenox	3,000	–	–	1	–	–	–	–	–	2	–	–	–	2	–	2	–
187	Hopkinton	2,991	19	–	–	–	100	–	–	–	1	–	2	–	40	–	49	–
188	Nahant	2,890	11	–	–	–	2	–	11	–	1	–	4	–	11	–	–	–
189	West Boylston	2,874	–	–	6	–	28	–	1	–	2	–	14	–	13	–	63	–
190	Nantucket	2,870	–	–	–	–	–	–	–	–	6	–	1	–	–	–	–	–
191	Salisbury	2,828	–	–	7	–	1	–	22	–	15	–	47	–	3	–	–	–
192	Douglas	2,722	207	–	8	–	1	–	–	–	–	–	37	–	3	–	4	–
193	Avon	2,703	–	–	–	–	16	–	29	–	7	–	1	–	–	–	–	–
194	Hamilton	2,696	15	–	2	–	1	–	10	–	4	–	21	–	38	–	5	–
195	Hanson	2,695	1	–	–	–	6	–	1	–	29	–	27	–	14	–	–	–
196	Hadley	2,656	6	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–
197	Sutton	2,610	1	–	56	–	2	–	5	–	3	–	6	–	3	–	1	–
198	Yarmouth	2,608	1	–	2	–	–	–	5	–	–	–	–	–	5	–	19	–
199	Manchester	2,580	1	–	–	–	1	–	5	–	–	–	32	–	128	–	10	–
200	Duxbury	2,486	56	–	–	–	–	–	–	–	12	–	8	–	–	–	–	–
201	Townsend	2,479	15	–	–	–	1	–	1	–	11	–	–	–	3	–	33	–
202	Upton	2,479	–	–	8	–	–	–	21	–	8	–	2	–	8	–	1	–
203	Shirley	2,459	2	–	–	–	3	–	1	–	–	–	1	–	1	–	9	–
204	Middleton	2,456	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–
205	Merrimac	2,425	1	–	18	–	11	–	35	–	–	–	19	–	11	–	6	–
206	Southboro	2,421	42	–	12	–	4	–	26	–	5	–	–	–	20	–	85	–
207	Sturbridge	2,420	8	–	1	–	–	–	–	–	2	–	–	–	–	–	6	–
208	Marshfield	2,405	3	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–
209	Norwell	2,393	–	–	–	–	1	–	1	–	1	–	1	–	–	–	–	–
210	Ashburnham	2,380	–	–	12	–	2	–	1	–	1	–	–	–	35	–	–	–
211	Millis	2,363	1	–	1	1	–	–	1	–	10	–	1	–	–	–	–	–
212	Mattapoisett	2,347	–	–	1	–	70	–	3	–	2	–	2	–	6	–	35	–
213	Sudbury	2,322	2	–	–	–	1	–	5	–	37	–	4	–	7	–	–	–
214	Plainville	2,278	–	–	–	–	–	–	–	–	–	–	9	–	14	–	1	–
215	Raynham	2,263	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
216	Chatham	2,241	2	–	–	–	2	–	–	–	4	–	–	–	5	–	39	–
217	Marion	2,216	29	–	1	–	28	–	2	–	2	–	–	–	4	–	78	–
218	Hatfield	2,188	7	–	–	–	–	–	46	–	17	–	1	–	3	–	8	–
219	Lincoln	2,179	2	–	–	–	9	–	11	–	–	–	–	–	–	–	–	–
220	Northfield	2,162	26	–	10	–	4	–	16	–	61	–	1	–	22	–	18	–
221	Westminster	2,153	–	–	9	–	–	–	–	–	1	–	2	–	17	–	29	–

222	Groveland	2,150	19	–	3	–	1	–	44	–	1	–	–	–	–	–	23	–
223	Southwick	2,141	10	–	–	–	–	–	–	–	–	–	1	–	5	–	11	–
224	Georgetown	2,122	2	–	–	–	–	–	25	–	–	–	–	–	1	–	–	–
225	Hardwick	2,115	–	–	1	–	3	–	1	–	114	–	–	–	–	–	9	–
226	Harwich	2,071	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
227	Sterling	2,043	1	–	4	–	1	–	11	–	63	–	–	–	1	–	1	–
228	Freetown	2,027	–	–	–	–	–	–	6	–	–	–	–	–	1	–	2	–
229	Norfolk	2,006	1	–	9	–	–	–	1	–	16	–	1	–	1	–	1	–
230	Williamsburg	1,980	7	–	1	–	–	–	1	–	2	–	1	–	12	–	–	–
231	Pembroke	1,917	–	–	–	–	4	–	4	–	30	–	–	–	–	–	14	–
232	Dennis	1,807	4	–	–	–	–	–	1	–	–	–	6	–	5	–	3	–
233	Sheffield	1,801	1	–	150	–	85	–	4	–	10	–	–	–	11	–	21	–
234	Lanesborough	1,754	–	–	–	–	–	–	–	–	7	–	–	–	–	–	–	–
235	Stockbridge	1,739	19	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
236	Dover	1,736	6	–	6	–	1	–	55	–	–	–	1	–	–	–	4	–
237	Tisbury	1,719	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
238	Cheshire	1,718	–	–	–	–	–	–	–	–	–	–	4	–	–	–	–	–
239	Essex	1,705	2	–	–	–	–	–	9	–	–	–	–	–	–	–	–	–
240	Newbury	1,677	–	–	2	–	–	–	4	–	–	–	–	–	2	–	–	–
241	Littleton	1,673	73	–	–	–	4	–	6	–	33	–	2	–	28	–	10	–
242	Sandwich	1,671	–	–	–	–	–	–	–	–	–	–	5	–	22	1	–	–
243	Shelburne	1,656	3	–	–	–	–	–	–	–	6	–	–	–	–	–	–	–
244	Mendon	1,650	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
245	Orleans	1,642	4	–	–	–	1	–	2	–	–	–	–	–	–	–	116	–
246	Rowley	1,626	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
247	Millville	1,616	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
248	Rutland	1,561	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
249	Lakeville	1,555	1	–	1	–	18	–	–	–	1	–	1	–	4	–	7	–
250	Wenham	1,550	7	–	1	–	–	–	3	–	3	–	43	–	13	–	5	–
251	Buckland	1,525	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
252	West Brookfield	1,512	4	–	–	–	–	–	14	–	55	–	–	–	1	–	3	–
253	West Newbury	1,503	4	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–
254	Tyngsborough	1,495	38	–	–	–	13	–	18	–	8	–	–	–	3	–	6	–
255	Colrain	1,455	42	–	–	–	–	–	–	–	19	–	13	–	–	–	1	–
256	Clarksburg	1,450	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
257	Stow	1,427	28	–	1	–	1	–	5	–	15	–	–	–	5	–	17	–
258	Brookfield	1,390	3	–	1	–	3	–	30	–	58	–	3	–	–	–	2	–
259	Carver	1,383	2	–	–	–	–	–	–	–	–	–	–	–	–	–	26	–
260	Oak Bluffs	1,345	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
261	Hinsdale	1,325	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
262	Erving	1,315	9	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
263	Boylston	1,313	–	–	–	–	8	–	5	–	–	–	50	–	16	–	–	–
264	Edgartown	1,296	8	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
265	Hampden	1,256	–	–	1	–	–	–	–	–	–	–	–	–	–	–	4	–
266	Southampton	1,254	1	–	1	–	1	–	6	–	46	–	–	–	–	–	–	–
267	Chester	1,252	2	–	–	–	–	–	–	–	–	–	–	–	1	–	2	–
268	Huntington	1,242	–	–	11	–	–	–	–	–	–	–	–	–	2	–	1	–
269	Berkley	1,231	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
270	Russell	1,221	11	–	–	–	–	–	4	–	–	–	–	–	–	–	28	–
271	Granby	1,193	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
272	Berlin	1,174	–	–	–	–	–	–	2	–	5	–	–	–	–	–	12	–
273	Ashby	1,155	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	MUMPS															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
274	Topsfield	1,153	5	–	–	–	–	–	17	–	3	–	3	–	79	–	2	–
275	East Brookfield	1,125	27	–	–	–	9	–	1	–	–	–	1	–	5	–	3	–
276	Rochester	1,107	–	–	–	–	–	–	–	–	–	–	–	–	–	–	17	–
277	Halifax	1,093	–	–	–	–	–	–	–	–	–	–	11	–	–	–	–	–
278	Bernardston	1,070	–	–	–	–	1	–	3	–	6	–	1	–	–	–	–	–
279	Harvard	1,065	6	–	–	–	2	–	1	–	29	–	18	–	–	–	1	–
280	West Stockbridge	1,059	–	–	–	–	16	–	–	–	–	–	–	–	–	–	–	–
281	Sherborn	1,036	3	–	–	–	9	–	4	–	–	–	–	–	–	–	–	–
282	Hubbardston	1,019	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
283	Sunderland	1,018	–	–	–	–	–	–	–	–	5	–	–	–	–	–	–	–
284	Princeton	1,012	–	–	1	–	–	–	–	–	–	–	2	–	2	–	18	–
285	Ashfield	981	1	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–
286	Brimfield	975	–	–	–	–	–	–	–	–	–	–	–	–	3	–	4	–
287	Whately	973	–	–	–	–	–	–	–	–	1	–	–	–	–	–	2	–
288	Gill	918	8	–	–	–	–	–	39	–	–	–	–	–	4	–	–	–
289	Bolton	905	1	–	2	–	–	–	–	–	4	–	–	–	–	–	–	–
290	Paxton	905	–	–	6	–	–	–	–	–	–	–	3	–	1	–	10	–
291	New Marlboro	896	1	–	21	–	1	–	3	–	–	–	–	–	3	–	2	–
292	Conway	867	8	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
293	Boxford	852	–	–	1	–	–	–	1	–	–	–	1	–	1	–	–	–
294	Wellfleet	851	–	–	–	–	12	–	3	–	–	–	–	–	–	–	2	–
295	Charlemont	812	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
296	Brewster	757	–	–	–	–	–	–	–	–	–	–	3	–	1	–	8	–
297	Royalston	750	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
298	Petersham	743	2	–	1	–	3	–	3	–	4	–	–	–	–	–	–	–
299	Carlisle	697	–	–	–	–	–	–	3	–	–	–	1	–	2	–	6	–
300	Becket	682	–	–	–	–	–	–	18	–	–	–	5	–	1	–	–	–
301	Egremont	660	2	–	1	–	26	–	–	–	3	–	–	–	8	–	1	–
302	Granville	656	13	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
303	Richmond	646	–	–	–	–	20	–	–	–	–	–	–	–	46	–	–	–
304	Eastham	604	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
305	Leverett	594	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
306	Truro	582	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–
307	Blandford	572	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
308	Plympton	545	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
309	Cummington	532	22	–	–	–	1	–	12	–	1	–	–	–	–	–	16	–
310	Pelham	512	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
311	Phillipston	475	–	–	–	–	–	–	–	–	1	–	–	–	–	–	6	–
312	Dunstable	440	4	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–

313	Oakham	424	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
314	Westhampton	413	8	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
315	New Braintree	409	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
316	Florida	401	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
317	Warwick	401	4	–	–	–	–	–	–	–	5	–	–	–	1	–	–	–
318	Otis	377	–	–	–	–	1	–	–	–	–	–	–	–	1	–	2	–
319	Chesterfield	375	25	–	16	–	–	–	–	–	–	–	–	–	3	–	69	–
320	Sandisfield	370	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
321	New Salem	364	–	–	–	–	–	–	–	–	7	–	–	–	–	–	–	–
322	Worthington	363	–	–	–	–	–	–	2	–	–	–	–	–	–	–	3	–
323	Boxborough	358	2	–	–	–	–	–	1	–	1	–	1	–	–	–	–	–
324	Wales	354	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
325	Hancock	349	–	–	–	–	–	–	–	–	9	–	1	–	–	–	–	–
326	Wendell	348	4	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
327	Mashpee	343	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
328	Goshen	328	21	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
329	Heath	327	51	–	–	–	–	–	–	–	2	–	4	–	1	–	2	–
330	Monterey	305	–	–	2	–	3	–	–	–	7	–	–	–	–	–	–	–
331	Savoy	294	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
332	Windsor	274	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
333	Holland	265	–	–	–	–	–	–	–	–	5	–	–	–	–	–	–	–
334	Leyden	254	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
335	Washington	242	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
336	WestTisbury	239	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
337	Chilmark	230	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
338	Middlefield	226	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
339	Plainfield	224	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
340	Tyringham	211	–	–	–	–	2	–	–	–	1	–	–	–	–	–	–	–
341	Alford	207	1	–	–	–	–	–	3	–	–	–	1	–	–	–	–	–
342	Hawley	203	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
343	Shutesbury	201	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
344	Rowe	178	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
345	Monroe	171	10	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
346	Montgomery	137	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
347	Peru	116	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
348	Gay Head	114	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
349	Tolland	111	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
350	Gosnold	107	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
351	New Ashford	99	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
352	Mt. Washington	53	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
353	Tewksbury State Hospital		2	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
354	Military Establishments		260	–	609	–	343	–	128	–	15	–	–	–	–	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities*

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	POLIOMYELITIS															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
1	Massachusetts	4,660,546	36	3	252	18	436	17	527	22	378	19	345	12	175	5	1,782	51
2	Boston	766,386	4	1	17	1	37	3	107	6	29	3	37	1	11	–	267	4
3	Worcester	203,171	1	–	1	2	10	–	8	1	79	4	18	–	18	–	58	2
4	Springfield	168,955	1	–	2	–	76	–	8	1	3	–	5	–	15	–	24	1
5	Fall River	115,062	–	–	17	–	2	–	1	–	3	–	13	–	–	–	11	–
6	Cambridge	111,305	–	–	5	–	4	–	6	–	2	–	14	–	4	–	37	1
7	Lynn	111,305	1	1	18	1	2	–	6	1	9	–	15	–	–	–	76	3
8	New Bedford	110,308	–	–	5	1	1	–	–	–	6	–	8	2	2	1	14	–
9	Somerville	109,135	3	–	1	1	3	–	8	–	4	–	5	2	–	–	51	1
10	Lowell	101,229	1	–	2	–	–	–	6	1	12	–	3	–	–	–	8	1
11	Quincy	87,584	–	–	5	–	5	–	17	1	1	1	5	–	1	–	54	–
12	Lawrence	86,714	–	–	–	–	–	–	3	–	–	–	1	–	–	–	5	–
13	Newton	83,715	1	–	3	1	10	1	11	–	19	2	14	1	6	–	46	2
14	Medford	70,548	–	–	2	–	3	–	18	1	7	–	4	–	1	–	47	3
15	Brockton	67,706	–	–	3	–	3	–	4	–	1	–	3	–	–	–	23	1
16	Brookline	63,221	–	–	–	–	6	1	5	–	5	–	11	–	3	–	25	–
17	Malden	60,922	–	–	2	1	–	–	19	1	8	–	2	–	–	–	35	1
18	Pittsfield	56,931	2	–	3	–	53	–	16	–	–	1	2	–	1	–	19	1
19	Holyoke	53,775	1	–	1	–	9	2	5	–	2	–	1	–	–	–	9	–
20	Everett	50,088	–	–	2	–	1	–	8	–	6	–	2	–	2	–	27	–
21	Chicopee	47,219	–	–	–	–	17	1	4	–	1	–	2	–	1	–	5	–
22	Waltham	46,693	–	–	10	1	2	–	5	–	5	–	8	1	3	–	36	1
23	Arlington	46,541	–	–	2	–	6	–	5	–	7	1	5	–	1	–	27	–
24	Haverhill	46,162	–	–	3	–	11	1	5	–	3	–	–	–	1	–	12	–
25	Fitchburg	45,447	3	–	2	–	1	–	7	–	2	–	2	–	–	–	10	1
26	Salem	44,232	1	–	8	–	–	–	8	–	1	–	6	1	5	–	19	1
27	Chelsea	39,940	1	–	1	–	2	–	11	–	1	–	1	–	–	–	17	–
28	Taunton	39,661	–	–	–	–	–	1	1	–	1	–	8	–	–	–	6	–
29	Watertown	39,199	–	–	4	–	5	–	3	–	5	–	4	–	4	1	20	2
30	Revere	36,805	–	–	1	–	4	–	7	–	3	–	4	1	1	–	13	1
31	Weymouth	31,556	3	1	2	–	2	–	5	–	1	1	1	–	–	–	20	1
32	Belmont	30,627	–	–	3	1	1	–	7	1	–	–	–	–	2	–	8	–
33	Melrose	30,274	–	–	1	–	2	–	2	–	–	–	1	–	1	–	25	2
34	Beverly	27,925	–	–	33	1	1	–	5	–	1	–	3	–	–	–	11	1
35	Framingham	27,489	–	–	1	–	2	–	1	–	3	–	1	–	1	–	11	–
36	Gloucester	25,562	–	–	–	–	1	–	11	–	2	–	2	–	4	–	–	–
37	Northampton	25,129	–	–	–	–	3	–	5	–	4	–	2	–	2	–	4	–
38	Leominster	24,697	–	–	–	–	–	1	3	–	1	–	1	–	1	–	14	–
39	Milton	24,366	–	–	1	–	2	–	5	–	2	–	6	–	–	–	22	1

40	Methuen	24,271	–	–	1	–	–	–	–	1	1	–	–	–	–	–	1	–
41	Braintree	23,675	2	–	4	–	1	–	1	–	–	–	2	–	–	–	12	1
42	Peabody	22,797	–	–	3	1	–	–	2	–	–	–	1	–	2	1	5	–
43	Attleboro	22,621	–	–	8	–	–	1	–	–	–	–	2	–	1	–	12	–
44	North Adams	22,230	–	–	2	–	2	–	6	–	9	–	–	–	–	–	2	–
45	West Springfield	21,500	–	–	–	–	16	–	1	–	–	–	1	1	4	–	5	1
46	Westfield	20,963	–	–	–	–	2	–	1	–	–	–	–	–	–	–	3	–
47	Wakefield	20,845	–	–	3	1	–	–	2	–	–	–	4	–	–	–	7	1
48	Winthrop	20,422	–	–	–	–	–	–	6	–	–	–	3	–	1	–	22	–
49	Gardner	20,300	–	–	–	–	–	–	3	1	2	–	1	–	–	–	4	–
50	Woburn	19,976	–	–	–	–	–	–	3	–	–	–	1	–	1	–	12	–
51	Wellesley	19,720	–	–	–	–	1	–	2	–	4	–	10	–	2	–	9	–
52	Saugus	18,267	–	–	2	–	–	–	5	–	–	–	4	1	–	–	7	–
53	Southbridge	18,217	–	–	3	–	2	–	–	–	3	–	2	–	–	–	–	–
54	Greenfield	18,182	–	–	1	–	2	–	2	–	1	–	1	–	–	–	3	1
55	Dedham	17,644	–	–	–	–	1	–	5	2	1	–	5	–	–	–	19	1
56	Natick	17,505	–	–	5	–	4	–	–	–	1	–	1	–	1	–	11	–
57	Norwood	17,493	–	–	5	–	–	–	2	–	1	1	–	–	1	–	15	–
58	Needham	16,307	–	–	–	–	–	–	–	–	5	1	–	–	–	–	9	–
59	Milford	16,147	–	–	–	–	–	–	1	–	1	–	2	–	–	–	3	–
60	Marlborough	16,132	–	–	–	–	1	–	1	–	1	–	–	–	1	–	5	1
61	Lexington	15,536	–	–	–	1	2	–	4	–	–	–	–	–	1	–	5	–
62	Winchester	15,481	–	–	1	–	2	–	–	–	–	–	–	–	–	–	11	–
63	Danvers	15,025	–	–	3	–	1	–	1	–	–	–	–	–	4	–	–	–
64	Newburyport	14,223	–	–	–	–	1	–	–	–	–	–	–	–	–	–	10	–
65	Marblehead	13,964	–	–	2	–	1	–	5	–	2	–	–	–	3	–	8	–
66	Plymouth	13,943	–	–	1	–	–	–	1	–	–	–	–	–	1	–	6	–
67	Webster	13,826	–	–	–	–	1	–	–	–	2	–	–	–	–	–	2	–
68	Reading	13,637	–	–	1	–	4	1	10	1	–	–	2	–	–	–	9	–
69	Stoneham	13,116	1	–	–	–	–	–	–	–	2	–	1	–	1	–	2	–
70	Fairhaven	13,072	–	–	–	–	–	–	–	–	–	–	2	–	–	–	2	–
71	Clinton	12,991	–	–	–	–	–	–	1	–	–	–	–	–	–	–	3	–
72	Adams	12,821	–	–	2	–	1	–	2	–	–	–	–	–	1	–	2	1
73	Swampscott	12,781	–	–	1	–	1	–	1	–	1	–	–	–	1	–	6	–
74	Andover	12,620	–	–	–	–	–	–	–	–	–	–	2	–	1	–	2	–
75	North Attleboro	12,601	–	–	2	1	–	–	–	–	2	–	2	–	–	–	9	1
76	Athol	12,351	–	–	–	–	1	–	2	–	2	–	1	–	–	–	–	–
77	Hingham	11,132	–	–	–	–	2	–	2	–	–	–	3	–	–	–	10	–
78	Easthampton	10,830	–	–	1	–	–	–	–	–	6	1	1	–	–	–	–	–
79	Amesbury	10,824	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–
80	Shrewsbury	10,791	–	–	–	–	–	–	1	–	2	–	–	–	1	–	2	–
81	Dartmouth	10,712	–	–	–	–	–	–	1	–	–	–	2	–	2	–	1	–
82	Northbridge	10,212	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–
83	Palmer	10,211	2	–	1	–	2	–	–	–	–	–	–	–	1	–	4	1
84	Middleborough	10,099	–	–	–	–	2	–	–	–	1	–	4	1	2	–	2	–
85	Stoughton	9,470	–	–	–	–	–	–	–	–	1	–	1	–	–	–	6	–
86	Chelmsford	9,268	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–
87	Walpole	9,258	–	–	1	–	–	–	3	–	5	–	–	–	1	–	6	–
88	Randolph	9,210	–	–	–	–	–	–	–	–	1	–	–	–	–	–	5	–
89	Rockland	9,053	–	–	–	–	1	–	2	–	–	–	1	–	–	–	6	–
90	Billerica	9,001	–	–	–	1	–	–	2	–	–	–	–	–	–	–	7	–
91	Auburn	8,958	–	–	–	–	–	–	–	–	1	–	–	–	–	–	6	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	CITIES AND TOWNS IN ORDER OF POPULATION	Population estimated as of July 1, 1949	POLIOMYELITIS															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
92	Barnstable	8,943	–	–	–	–	–	–	3	–	–	–	1	–	1	–	5	–
93	Agawam	8,915	–	–	–	–	2	–	–	–	–	–	1	–	1	–	1	–
94	Concord	8,743	–	–	–	–	–	–	2	–	–	1	3	–	–	–	7	1
95	Whitman	8,740	–	–	–	–	2	1	1	–	–	–	1	–	1	–	4	–
96	Bridgewater	8,641	–	–	–	–	–	–	–	–	–	–	1	–	–	–	3	1
97	Falmouth	8,489	–	–	–	–	–	–	1	–	3	–	3	–	–	–	12	1
98	Grafton	8,425	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–
99	Wareham	8,392	–	–	–	–	–	–	2	–	1	–	–	–	–	–	5	–
100	North Andover	8,286	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
101	Millbury	8,268	–	–	–	–	–	–	1	–	–	–	–	–	1	1	–	–
102	Hudson	8,171	–	–	–	–	–	–	–	–	–	–	–	–	–	–	8	–
103	Ludlow	8,065	–	–	–	–	7	–	–	–	–	–	–	–	–	–	1	–
104	South Hadley	7,809	–	–	2	–	1	–	–	–	3	–	–	–	–	–	2	–
105	Franklin	7,735	–	–	–	–	–	–	–	–	3	–	1	–	–	–	6	–
106	Amherst	7,696	2	–	3	–	2	–	–	–	1	–	–	–	1	–	2	–
107	Somerset	7,668	–	–	–	–	–	–	1	–	–	–	1	–	–	–	2	–
108	Montague	7,602	–	–	–	–	–	–	1	–	2	–	–	–	–	–	2	–
109	Ware	7,578	–	–	–	–	–	–	1	–	2	–	–	–	–	–	3	–
110	Dracut	7,524	–	–	–	–	–	–	–	–	2	–	–	–	1	–	3	–
111	Mansfield	7,380	–	–	1	–	–	–	–	–	–	–	–	–	1	–	10	1
112	Maynard	7,198	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–
113	Canton	7,010	–	–	–	–	–	–	3	–	1	–	1	–	–	–	6	–
114	Abington	6,963	–	–	–	–	–	–	–	–	–	–	–	–	1	–	8	–
115	Longmeadow	6,957	1	–	–	–	–	–	1	–	–	–	–	–	–	–	4	–
116	Westborough	6,866	–	–	–	–	–	–	2	–	–	–	–	–	–	–	4	–
117	Ipswich	6,857	–	–	1	–	–	–	1	1	1	–	2	–	–	–	3	1
118	Spencer	6,856	–	–	–	–	–	–	–	–	1	–	–	–	–	–	2	–
119	Uxbridge	6,836	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4	1
120	Foxborough	6,627	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
121	Great Barrington	6,581	–	–	–	–	1	–	–	–	–	–	–	–	1	–	2	–
122	Winchendon	6,461	–	–	–	–	–	–	–	–	1	–	1	–	–	–	7	1
123	Wilmington	6,377	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4	–
124	Swansea	6,319	–	–	1	–	–	–	1	–	–	–	1	–	–	–	2	–
125	Easton	6,223	1	–	–	–	2	–	–	–	–	–	2	–	–	–	–	–
126	Westwood	6,053	–	–	–	–	–	–	5	–	–	–	2	–	–	–	2	–
127	Tewksbury	5,949	–	–	–	–	–	–	–	–	–	–	1	–	–	–	3	–
128	Orange	5,907	1	–	–	–	1	–	–	–	1	–	–	–	–	–	2	–
129	Monson	5,713	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
130	Holden	5,648	–	–	–	–	–	–	–	–	–	–	–	–	1	–	2	–

131	Seekonk	5,552	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
132	Scituate	5,526	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	3	–	–
133	Wrentham	5,437	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	5	–	–
134	Leicester	5,409	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
135	Oxford	5,368	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
136	Westport	5,297	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	3	–	–
137	Weston	5,241	–	–	1	–	–	–	–	–	–	4	–	–	1	–	2	–	4	–	–
138	Williamstown	4,919	1	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	3	–	–
139	Dudley	4,816	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
140	Dalton	4,517	–	–	–	–	8	–	7	–	–	–	–	–	–	–	–	–	2	1	–
141	Bedford	4,486	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
142	Lee	4,444	–	–	3	–	1	1	–	–	–	–	–	–	–	–	–	–	5	–	–
143	Hull	4,437	–	–	–	–	–	–	1	–	–	1	–	–	1	–	–	–	2	–	–
144	Templeton	4,435	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	2	–	–
145	Rockport	4,403	–	–	–	–	1	–	2	–	–	–	–	–	–	–	1	–	2	–	–
146	Sharon	4,379	–	–	–	–	2	–	1	–	–	–	–	–	–	–	–	–	11	–	–
147	Acushnet	4,370	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
148	Blackstone	4,349	–	–	–	–	–	–	–	–	–	4	–	–	–	–	–	–	1	–	–
149	Ayer	4,328	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–	1	–	–
150	Wayland	4,262	–	–	–	–	–	–	–	–	–	1	–	–	1	–	–	–	3	–	–
151	Medfield	4,199	–	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
152	East Longmeadow	4,163	–	–	1	1	2	–	–	–	–	1	–	–	–	–	–	–	2	–	–
153	East Bridgewater	4,158	–	–	–	–	–	–	1	–	–	2	–	–	–	–	–	–	5	–	–
154	Holbrook	4,056	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–
155	Belchertown	4,021	–	–	1	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
156	Cohasset	3,947	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–
157	Bellingham	3,935	–	–	–	–	–	–	–	–	–	1	–	–	1	–	–	–	1	–	–
158	West Bridgewater	3,905	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–
159	Westford	3,815	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	2	–	–
160	Bourne	3,716	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–
161	Holliston	3,582	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–	5	–	–
162	Provincetown	3,564	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
163	Hopedale	3,518	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
164	Charlton	3,507	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–
165	Warren	3,498	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
166	Barre	3,485	–	–	–	–	3	–	–	–	–	1	–	–	–	–	–	–	3	–	–
167	Lynnfield	3,476	–	–	–	–	–	–	1	–	–	1	–	–	1	–	1	–	4	–	–
168	Northboro	3,450	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–
169	Wilbraham	3,442	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	1	–	–
170	Deerfield	3,422	–	–	–	–	5	–	3	–	–	1	–	–	1	–	–	–	3	–	–
171	Medway	3,397	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
172	Ashland	3,326	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
173	Rehoboth	3,282	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–
174	North Reading	3,270	–	–	1	–	1	–	2	–	–	–	–	–	–	–	–	–	5	–	–
175	Hanover	3,168	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	3	–	–
176	North Brookfield	3,121	–	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–
177	Pepperell	3,119	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–
178	Groton	3,106	–	–	–	–	–	–	1	–	–	1	–	–	–	–	–	–	1	–	–
179	Norton	3,096	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–
180	Lancaster	3,092	–	–	–	–	–	–	1	–	–	1	–	–	–	–	–	–	6	–	–
181	Dighton	3,070	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–
182	Lunenburg	3,058	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population estimated as of July 1, 1949	POLIOMYELITIS															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
183	Kingston	3,018	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
184	Burlington	3,017	–	–	–	–	–	–	1	–	–	–	–	–	–	–	3	–
185	Acton	3,004	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
186	Lenox	3,000	–	–	–	–	2	–	1	–	–	–	1	–	–	–	1	–
187	Hopkinton	2,991	–	–	1	–	–	–	1	–	1	–	–	–	–	–	–	–
188	Nahant	2,890	–	–	–	–	–	–	2	–	–	–	–	–	–	–	2	–
189	West Boylston	2,874	–	–	–	–	–	–	–	–	–	–	–	–	19	–	1	–
190	Nantucket	2,870	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
191	Salisbury	2,828	–	–	–	–	–	–	–	–	–	–	–	–	1	–	3	–
192	Douglas	2,722	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
193	Avon	2,703	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
194	Hamilton	2,696	–	–	1	–	–	–	–	–	–	–	–	–	–	–	2	–
195	Hanson	2,695	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
196	Hadley	2,656	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
197	Sutton	2,610	–	–	–	–	–	–	1	–	1	1	–	–	–	–	–	–
198	Yarmouth	2,608	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–
199	Manchester	2,580	–	–	–	–	–	–	1	–	–	–	2	–	–	–	4	–
200	Duxbury	2,486	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
201	Townsend	2,479	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
202	Upton	2,479	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
203	Shirley	2,459	–	–	–	–	–	–	1	–	–	–	–	–	–	–	4	–
204	Middleton	2,456	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
205	Merrimac	2,425	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
206	Southboro	2,421	–	–	–	–	–	–	–	–	1	–	1	–	–	–	4	–
207	Sturbridge	2,420	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
208	Marshfield	2,405	–	–	–	–	–	–	1	–	–	–	1	–	–	–	8	–
209	Norwell	2,393	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
210	Ashburnham	2,380	–	–	–	–	–	–	–	–	8	1	–	–	–	–	1	–
211	Millis	2,363	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
212	Mattapoisett	2,347	–	–	–	–	1	–	–	–	–	–	–	–	–	–	2	–
213	Sudbury	2,322	–	–	–	–	–	–	–	–	1	–	3	–	–	–	–	–
214	Plainville	2,278	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4	–
215	Raynham	2,263	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
216	Chatham	2,241	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
217	Marion	2,216	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5	1
218	Hatfield	2,188	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
219	Lincoln	2,179	–	–	–	–	–	–	–	–	–	–	–	–	1	–	2	–
220	Northfield	2,162	–	–	–	–	–	–	–	–	2	–	1	–	–	–	–	–
221	Westminster	2,153	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5	–

222	Groveland . . .	2,150	–	–	–	–	3	–	1	–	1	–	–	–	1	–	1	–
223	Southwick . . .	2,141	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
224	Georgetown . . .	2,122	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
225	Hardwick	2,115	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–
226	Harwich	2,071	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
227	Sterling	2,043	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–
228	Freetown	2,027	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
229	Norfolk	2,006	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
230	Williamsburg . . .	1,980	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–
231	Pembroke . . .	1,917	–	–	–	–	4	1	–	–	–	–	–	–	–	–	3	–
232	Dennis	1,807	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5	–
233	Sheffield	1,801	–	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–
234	Lanesborough . . .	1,754	–	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–
235	Stockbridge . . .	1,739	–	–	–	–	3	–	–	–	–	–	–	–	–	–	3	–
236	Dover	1,736	–	–	–	–	–	–	–	–	1	–	–	–	1	–	1	–
237	Tisbury	1,719	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
238	Cheshire	1,718	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
239	Essex	1,705	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
240	Newbury	1,677	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–
241	Littleton	1,673	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–
242	Sandwich	1,671	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
243	Shelburne	1,656	–	–	–	–	1	–	–	–	3	–	–	–	–	–	–	–
244	Mendon	1,650	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
245	Orleans	1,642	–	–	–	–	–	–	4	1	–	–	–	–	–	–	–	–
246	Rowley	1,626	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
247	Millville	1,616	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
248	Rutland	1,561	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
249	Lakeville	1,555	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–
250	Wenham	1,550	–	–	2	–	–	–	–	–	–	–	1	–	–	–	–	–
251	Buckland	1,525	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
252	West Brookfield . .	1,512	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
253	West Newbury . . .	1,503	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
254	Tyngsborough . . .	1,495	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	1
255	Colrain	1,455	–	–	–	–	1	–	2	–	–	–	–	–	–	–	–	–
256	Clarksburg . . .	1,450	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
257	Stow	1,427	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
258	Brookfield . . .	1,390	–	–	–	–	–	–	–	–	4	–	–	–	–	–	–	–
259	Carver	1,383	–	–	–	–	–	–	–	–	–	–	–	–	2	–	1	–
260	Oak Bluffs . . .	1,345	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
261	Hinsdale	1,325	–	–	2	–	1	1	2	–	–	–	–	–	1	–	1	–
262	Erving	1,315	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
263	Boylston	1,313	–	–	–	–	2	–	–	–	–	–	1	–	–	–	1	–
264	Edgartown . . .	1,296	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
265	Hampden	1,256	–	–	–	–	3	–	–	–	–	–	–	–	–	–	2	–
266	Southampton . . .	1,254	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
267	Chester	1,252	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
268	Huntington . . .	1,242	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
269	Berkley	1,231	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
270	Russell	1,221	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
271	Granby	1,193	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
272	Berlin	1,174	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
273	Ashby	1,155	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	CITIES AND TOWNS IN ORDER OF POPULATION	Population Estimated as of July 1, 1949	POLIOMYELITIS															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
274	Topsfield	1,153	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–
275	East Brookfield	1,125	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
276	Rochester	1,107	–	–	–	–	–	–	1	1	–	–	–	–	–	–	2	–
277	Halifax	1,093	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
278	Bernardston	1,070	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
279	Harvard	1,065	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
280	West Stockbridge	1,059	–	–	–	–	1	–	–	–	–	–	1	–	1	–	–	–
281	Sherborn	1,036	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
282	Hubbardston	1,019	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
233	Sunderland	1,018	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
284	Princeton	1,012	–	–	–	–	–	–	2	–	–	–	–	–	1	–	–	–
285	Ashfield	981	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–
286	Brimfield	975	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
287	Whately	973	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
288	Gill	918	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
289	Bolton	905	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
290	Paxton	905	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
291	New Marlboro	896	–	–	1	–	–	–	–	–	–	–	3	–	–	–	–	–
292	Conway	867	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
293	Boxford	852	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
294	Wellfleet	851	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
295	Charlemont	812	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
296	Brewster	757	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
297	Royalston	750	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
298	Petersham	743	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
299	Carlisle	697	–	–	–	–	–	–	–	–	1	–	2	–	–	–	1	–
300	Becket	682	–	–	1	–	–	–	3	–	–	–	1	–	1	–	–	–
301	Egremont	660	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
302	Granville	656	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
303	Richmond	646	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–
304	Eastham	604	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
305	Leverett	594	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
306	Truro	582	–	–	1	–	–	–	–	–	–	–	–	–	–	–	3	–
307	Blandford	572	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
308	Plympton	545	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
309	Cummington	532	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
310	Pelham	512	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
311	Phillipston	475	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
312	Dunstable	440	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

313	Oakham	424	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
314	Westhampton	413	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
315	New Braintree	409	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
316	Florida	401	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
317	Warwick	401	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
318	Otis	377	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
319	Chesterfield	375	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
320	Sandisfield	370	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
321	New Salem	364	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
322	Worthington	363	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
323	Boxborough	358	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
324	Wales	354	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–
325	Hancock	349	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
326	Wendell	348	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
327	Mashpee	343	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
328	Goshen	328	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
329	Heath	327	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
330	Monterey	305	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
331	Savoy	294	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
332	Windsor	274	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
333	Holland	265	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
334	Leyden	254	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
335	Washington	242	–	–	–	–	–	–	–	–	5	–	1	–	–	–	–	–
336	West Tisbury	239	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
337	Chilmark	230	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
338	Middlefield	226	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
339	Plainfield	224	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
340	Tyringham	211	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
341	Alford	207	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
342	Hawley	203	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
343	Shutesbury	201	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
344	Rowe	178	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
345	Monroe	171	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
346	Montgomery	137	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
347	Peru	116	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
348	Gay Head	114	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
349	Tolland	111	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
350	Gosnold	107	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
351	New Ashford	99	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
352	Mt. Washington	53	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
353	Tewksbury State Hospital		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
354	Military Establishments		–	–	1	–	6	–	3	–	–	–	–	–	–	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities*

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	SCARLET FEVER															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
1	Massachusetts	4,660,546	11,526	10	15,400	19	11,956	14	10,373	7	6,079	2	4,424	4	6,033	1	6,052	1
2	Boston	766,386	2,639	4	4,000	7	2,256	–	1,892	1	1,053	–	596	–	1,799	–	1,620	–
3	Worcester	203,171	523	–	773	–	1,534	2	521	3	212	–	223	–	350	–	306	–
4	Springfield	168,955	1,036	–	1,772	–	624	–	370	–	211	–	94	–	50	–	145	1
5	Fall River	115,062	985	–	144	–	105	–	161	–	128	–	69	–	214	–	318	–
6	Cambridge	111,305	500	–	471	–	352	–	218	–	128	–	178	–	320	–	54	–
7	Lynn	111,305	120	–	130	–	129	–	131	–	185	–	205	–	65	1	152	–
8	New Bedford	110,308	208	–	473	–	17	1	48	–	206	–	336	–	231	–	184	–
9	Somerville	109,135	495	–	492	–	379	1	273	–	198	–	61	–	420	–	77	–
10	Lowell	101,229	37	–	140	–	160	–	231	1	114	–	28	–	25	–	119	–
11	Quincy	87,584	102	–	227	–	317	–	122	–	99	–	143	–	69	–	135	–
12	Lawrence	86,714	28	–	15	–	35	–	76	–	118	1	235	1	114	–	112	–
13	Newton	83,715	74	–	255	–	179	–	135	–	123	–	60	–	43	–	53	–
14	Medford	70,548	167	–	128	1	186	–	239	–	101	–	67	–	142	–	50	–
15	Brockton	67,706	294	–	120	–	392	–	204	–	101	–	58	–	33	–	27	–
16	Brookline	63,221	72	1	173	1	73	–	120	–	85	–	51	–	135	–	68	–
17	Malden	60,922	95	–	213	2	379	–	120	–	62	–	38	–	74	–	50	–
18	Pittsfield	56,931	28	–	107	–	158	–	447	–	37	–	30	–	40	–	63	–
19	Holyoke	53,775	248	–	115	–	183	1	137	–	48	–	23	–	26	–	11	–
20	Everett	50,088	71	–	114	–	63	–	120	–	40	–	22	–	29	–	35	–
21	Chicopee	47,219	158	–	254	–	102	–	268	1	32	–	51	–	34	–	15	–
22	Waltham	46,693	107	1	185	–	145	–	75	–	53	–	26	–	45	–	71	–
23	Arlington	46,541	56	–	147	–	141	–	128	–	91	–	50	–	81	–	48	–
24	Haverhill	46,162	83	–	86	–	70	–	64	–	36	–	69	–	66	–	54	–
25	Fitchburg	45,447	44	–	72	–	78	–	188	–	50	–	27	–	134	–	180	–
26	Salem	44,232	9	–	38	–	54	1	39	–	165	–	165	1	38	–	49	–
27	Chelsea	39,940	148	–	312	–	54	–	34	–	20	–	18	–	48	–	102	–
28	Taunton	39,661	8	–	6	–	–	1	14	–	2	–	3	–	3	–	8	–
29	Watertown	39,199	75	–	228	–	175	–	86	–	36	–	22	–	48	–	47	–
30	Revere	36,805	10	–	50	–	23	–	67	–	22	–	8	–	6	–	7	–
31	Weymouth	31,556	25	–	103	–	58	–	66	–	14	–	10	–	28	–	20	–
32	Belmont	30,627	65	–	108	–	88	–	76	–	54	–	19	–	17	–	34	–
33	Melrose	30,274	59	–	63	–	97	–	99	–	21	–	11	–	8	–	17	–
34	Beverly	27,925	17	–	13	–	16	–	31	–	11	–	13	–	9	–	12	–
35	Framingham	27,489	26	1	25	–	26	–	65	–	40	–	13	–	8	–	28	–
36	Gloucester	25,562	3	–	9	–	10	–	12	–	57	–	110	–	9	–	16	–
37	Northampton	25,129	81	–	30	–	43	–	47	–	39	–	26	–	9	–	9	–
38	Leominster	24,697	32	–	66	–	79	–	118	–	20	–	28	–	13	–	105	–
39	Milton	24,366	31	–	111	–	24	–	43	–	57	–	15	–	14	–	54	–

40	Methuen	24,271	9	–	9	–	13	–	28	–	10	–	72	–	41	–	41	–
41	Braintree	23,675	15	–	39	–	46	–	35	–	16	–	9	–	8	–	22	–
42	Peabody	22,797	11	–	180	1	32	–	30	–	22	–	28	–	37	–	50	–
43	Attleboro	22,621	9	–	8	–	33	–	33	–	27	–	9	–	8	–	18	–
44	North Adams	22,230	24	–	20	–	119	–	9	–	27	–	–	–	6	–	19	–
45	West Springfield	21,500	63	–	239	–	69	–	101	–	31	–	9	–	15	–	28	–
46	Westfield	20,963	32	–	37	–	29	1	24	–	10	–	3	–	6	–	5	–
47	Wakefield	20,845	20	–	70	–	68	–	20	–	16	–	14	–	11	–	8	–
48	Winthrop	20,422	21	–	65	–	39	–	40	–	11	–	14	–	98	–	19	–
49	Gardner	20,300	20	–	26	–	26	–	25	–	19	–	25	–	16	–	1	–
50	Woburn	19,976	149	–	36	–	29	–	30	–	21	–	13	–	4	–	15	–
51	Wellesley	19,720	11	–	81	–	39	–	54	–	20	–	33	–	25	–	13	–
52	Saugus	18,267	10	–	38	–	20	–	58	–	12	–	22	–	5	–	16	–
53	Southbridge	18,217	99	–	33	–	14	–	41	–	16	–	13	–	7	–	12	–
54	Greenfield	18,182	49	–	22	–	26	–	34	–	40	–	18	–	14	–	7	–
55	Dedham	17,644	10	–	8	–	20	–	15	–	8	–	7	–	5	–	42	–
56	Natick	17,505	60	–	14	–	20	–	189	–	43	–	8	–	25	–	52	–
57	Norwood	17,493	14	–	21	–	60	–	6	–	7	–	6	–	5	–	2	–
58	Needham	16,307	29	–	73	–	84	–	100	–	24	–	12	–	8	–	6	–
59	Milford	16,147	12	–	11	–	18	–	30	–	51	–	4	–	2	–	6	–
60	Marlborough	16,132	11	–	12	–	7	–	40	–	27	–	1	–	5	–	2	–
61	Lexington	15,536	18	–	58	–	14	–	13	–	25	–	1	–	5	–	14	–
62	Winchester	15,481	79	–	64	–	19	–	28	–	55	–	4	–	7	–	15	–
63	Danvers	15,025	9	–	5	1	2	–	6	–	16	–	27	–	7	–	6	–
64	Newburyport	14,223	8	–	8	–	8	1	37	–	13	1	36	–	16	–	8	–
65	Marblehead	13,964	11	–	9	–	34	–	57	–	9	–	11	–	18	–	17	–
66	Plymouth	13,943	23	–	12	–	98	–	138	–	37	–	10	–	4	–	2	–
67	Webster	13,826	2	–	7	–	16	–	9	–	8	–	23	–	36	–	1	–
68	Reading	13,637	12	–	26	–	33	–	12	–	24	–	10	–	6	–	11	–
69	Stoneham	13,116	15	–	73	–	20	–	22	–	9	–	3	–	6	–	9	–
70	Fairhaven	13,072	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
71	Clinton	12,991	15	–	8	–	21	–	30	–	72	–	10	–	2	–	5	–
72	Adams	12,821	4	–	3	–	30	–	8	–	16	–	7	–	2	–	3	–
73	Swampscott	12,781	6	–	13	–	14	–	9	–	9	–	22	–	5	–	19	–
74	Andover	12,620	14	–	9	–	25	–	40	–	28	–	11	–	4	–	5	–
75	North Attleboro	12,601	2	–	–	–	10	–	12	–	12	–	3	–	2	–	8	–
76	Athol	12,351	17	1	11	–	8	–	7	–	71	–	–	–	6	–	7	–
77	Hingham	11,132	9	–	7	–	1	–	19	–	4	–	–	–	2	–	14	–
78	Easthampton	10,830	31	–	8	–	14	–	3	–	18	–	–	–	1	–	–	–
79	Amesbury	10,824	12	–	8	–	3	–	11	–	59	–	103	1	16	–	5	–
80	Shrewsbury	10,791	13	–	6	–	33	–	13	–	10	–	5	–	18	–	14	–
81	Dartmouth	10,712	16	–	36	–	1	–	3	–	4	–	11	–	68	–	24	–
82	Northbridge	10,212	16	–	13	–	25	–	8	–	15	–	7	–	9	–	1	–
83	Palmer	10,211	101	–	22	–	20	1	15	–	12	–	8	–	–	–	5	–
84	Middleborough	10,099	20	–	1	–	6	–	65	–	3	–	30	–	2	–	–	–
85	Stoughton	9,470	91	–	32	–	39	–	15	–	11	–	3	–	49	–	21	–
86	Chelmsford	9,268	–	–	2	–	5	1	4	–	10	–	–	–	5	–	11	–
87	Walpole	9,258	12	–	23	–	20	–	9	–	11	–	4	–	20	–	3	–
88	Randolph	9,210	1	–	1	–	3	–	15	–	15	–	7	–	4	–	9	–
89	Rockland	9,053	18	–	7	–	3	–	4	–	9	–	4	–	2	–	7	–
90	Billerica	9,001	42	–	40	1	18	–	23	–	9	–	4	–	13	–	14	–
91	Auburn	8,958	28	–	20	–	52	–	20	–	5	–	16	–	15	–	17	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	SCARLET FEVER															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
92	Barnstable	8,943	13	–	38	–	21	–	1	–	2	–	5	–	–	–	6	–
93	Agawam	8,915	67	–	117	–	33	–	25	–	15	–	7	–	3	–	19	–
94	Concord	8,743	7	–	7	–	9	–	6	–	14	–	1	–	–	–	7	–
95	Whitman	8,740	10	–	3	–	37	–	42	–	9	–	4	–	1	–	–	–
96	Bridgewater	8,641	10	–	5	–	22	1	8	–	18	–	3	–	3	–	14	–
97	Falmouth	8,489	12	–	92	–	–	–	2	–	2	–	3	–	3	–	19	–
98	Grafton	8,425	3	–	11	–	1	–	59	–	3	–	3	–	6	–	8	–
99	Wareham	8,392	5	–	6	–	11	–	16	–	4	–	27	–	17	–	4	–
100	North Andover	8,286	3	–	4	–	7	–	16	–	9	–	19	–	5	–	18	–
101	Millbury	8,268	16	–	17	–	109	–	44	–	11	–	2	–	2	–	13	–
102	Hudson	8,171	–	–	1	–	–	–	5	–	1	–	–	–	–	–	–	–
103	Ludlow	8,065	30	–	149	1	55	–	4	–	10	–	–	–	4	–	18	–
104	South Hadley	7,809	87	–	14	–	9	–	2	–	3	–	2	–	1	–	3	–
105	Franklin	7,735	3	–	10	–	4	–	35	1	31	–	27	–	18	–	24	–
106	Amherst	7,696	95	–	74	–	24	–	36	–	7	–	6	–	2	–	8	–
107	Somerset	7,668	28	–	4	–	1	–	4	–	–	–	1	–	4	–	2	–
108	Montague	7,602	17	–	27	1	3	–	8	–	9	–	6	–	–	–	–	–
109	Ware	7,578	4	–	56	–	3	–	2	–	3	–	–	–	–	–	1	–
110	Dracut	7,524	4	–	–	–	7	–	20	–	3	–	13	–	4	–	8	–
111	Mansfield	7,380	1	–	2	–	11	–	7	–	2	–	3	–	–	–	2	–
112	Maynard	7,198	27	–	15	–	7	–	2	–	–	–	1	–	7	–	4	–
113	Canton	7,010	24	–	20	–	69	–	4	–	4	–	1	–	3	–	3	–
114	Abington	6,963	61	–	27	–	14	–	24	–	2	–	3	–	3	–	6	–
115	Longmeadow	6,957	4	–	27	–	41	–	12	–	29	–	4	–	2	–	4	–
116	Westborough	6,866	13	–	31	1	10	–	6	–	5	–	20	–	4	–	89	–
117	Ipswich	6,857	15	–	17	–	1	–	88	–	16	–	3	–	14	–	13	–
118	Spencer	6,856	16	–	9	–	25	–	7	–	20	–	1	–	1	–	12	–
119	Uxbridge	6,836	1	–	7	–	5	–	7	–	2	–	2	–	31	–	5	–
120	Foxborough	6,627	6	–	5	–	1	–	5	–	3	–	–	–	–	–	2	–
121	Great Barrington	6,581	–	–	2	–	11	–	10	–	4	–	3	–	3	–	7	–
122	Winchendon	6,461	23	–	4	–	6	–	8	–	40	–	23	–	3	–	6	–
123	Wilmington	6,377	1	–	2	–	1	–	–	–	5	–	1	–	–	–	–	–
124	Swansea	6,319	23	–	1	–	12	–	19	–	–	–	4	–	8	–	17	–
125	Easton	6,223	39	–	7	–	17	–	20	–	6	–	4	–	3	–	6	–
126	Westwood	6,053	4	–	2	–	18	–	7	–	5	–	4	–	5	–	4	–
127	Tewksbury	5,949	–	–	2	–	–	–	2	–	11	–	–	–	–	–	–	–
128	Orange	5,907	16	–	4	–	–	–	1	–	8	–	4	–	4	–	2	–
129	Monson	5,713	13	–	12	–	36	–	1	–	8	–	–	–	5	–	6	–
130	Holden	5,648	10	–	7	–	18	–	7	–	6	–	1	–	19	–	16	–

131	Seekonk	5,552	–	–	1	–	1	–	5	–	13	–	–	–	4	–	3	–	–	–	–	–	–
132	Scituate	5,526	12	–	7	–	9	–	5	–	7	–	4	–	–	–	5	–	–	–	–	–	–
133	Wrentham	5,437	22	–	8	–	14	–	14	–	8	–	15	–	7	–	14	–	–	–	–	–	–
134	Leicester	5,409	2	–	2	1	1	–	8	–	1	–	–	–	–	–	13	–	–	–	–	–	–
135	Oxford	5,368	6	–	4	–	57	–	34	–	10	–	8	–	9	–	24	–	–	–	–	–	–
136	Westport	5,297	35	–	4	–	1	–	6	–	6	–	2	–	5	–	8	–	–	–	–	–	–
137	Weston	5,241	2	–	3	–	3	–	10	–	14	–	1	–	5	–	8	–	–	–	–	–	–
138	Williamstown	4,919	6	–	33	–	31	–	6	–	12	–	2	–	5	–	4	–	–	–	–	–	–
139	Dudley	4,816	–	–	–	–	–	–	3	–	–	–	2	–	4	–	3	–	–	–	–	–	–
140	Dalton	4,517	1	–	3	–	37	–	47	–	–	–	–	–	–	–	1	–	–	–	–	–	–
141	Bedford	4,486	2	–	19	–	–	–	4	–	–	–	1	–	3	–	9	–	–	–	–	–	–
142	Lee	4,444	20	–	14	–	4	–	10	–	2	–	1	–	5	–	2	–	–	–	–	–	–
143	Hull	4,437	2	–	1	–	2	–	47	–	1	–	–	–	7	–	6	–	–	–	–	–	–
144	Templeton	4,435	24	1	–	–	2	–	10	–	–	–	9	–	10	–	3	–	–	–	–	–	–
145	Rockport	4,403	–	–	–	–	–	–	3	–	1	–	7	–	3	–	–	–	–	–	–	–	–
146	Sharon	4,379	16	–	13	–	10	–	5	–	6	–	–	–	9	–	1	–	–	–	–	–	–
147	Acushnet	4,370	4	–	10	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
148	Blackstone	4,349	–	–	2	–	1	–	–	–	–	–	1	–	1	–	2	–	–	–	–	–	–
149	Ayer	4,328	5	–	28	–	7	–	10	–	15	–	–	–	10	–	12	–	–	–	–	–	–
150	Wayland	4,262	5	–	1	–	2	–	10	–	13	–	2	–	6	–	2	–	–	–	–	–	–
151	Medfield	4,199	5	–	–	–	–	–	1	–	1	–	1	–	–	–	14	–	–	–	–	–	–
152	East Longmeadow	4,163	18	–	23	–	13	–	7	–	–	–	4	–	2	–	1	–	–	–	–	–	–
153	East Bridgewater	4,158	15	–	25	–	18	–	1	–	5	–	5	–	4	–	2	–	–	–	–	–	–
154	Holbrook	4,056	12	–	18	–	28	–	56	–	5	–	–	–	1	–	1	–	–	–	–	–	–
155	Belchertown	4,021	9	–	63	–	22	–	11	–	4	–	2	–	8	–	19	–	–	–	–	–	–
156	Cohasset	3,947	2	–	–	–	3	–	2	–	3	–	–	–	11	–	1	–	–	–	–	–	–
157	Bellingham	3,935	–	–	–	–	–	–	2	–	–	–	–	–	–	–	1	–	–	–	–	–	–
158	West Bridgewater	3,905	6	–	3	–	8	–	21	–	5	–	2	–	3	–	10	–	–	–	–	–	–
159	Westford	3,815	14	–	5	–	9	–	2	–	1	–	1	–	1	–	24	–	–	–	–	–	–
160	Bourne	3,716	33	–	7	–	4	–	6	–	1	–	12	–	–	–	2	–	–	–	–	–	–
161	Holliston	3,582	2	–	3	–	–	–	5	–	1	–	1	–	–	–	6	–	–	–	–	–	–
162	Provincetown	3,564	7	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
163	Hopedale	3,518	1	–	2	–	5	–	12	–	4	–	–	–	–	–	–	–	–	–	–	–	–
164	Charlton	3,507	–	–	–	–	–	–	2	–	2	–	3	–	4	–	9	–	–	–	–	–	–
165	Warren	3,498	13	–	–	–	7	–	6	–	54	–	1	–	3	–	6	–	–	–	–	–	–
166	Barre	3,485	6	–	8	–	34	–	9	–	2	–	2	–	12	–	28	–	–	–	–	–	–
167	Lynnfield	3,476	2	–	1	–	4	–	2	–	10	–	4	–	4	–	13	–	–	–	–	–	–
168	Northboro	3,450	1	–	2	1	–	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–
169	Wilbraham	3,442	13	–	18	–	5	–	2	–	2	–	–	–	3	–	2	–	–	–	–	–	–
170	Deerfield	3,422	11	–	3	–	1	–	3	–	5	–	–	–	–	–	3	–	–	–	–	–	–
171	Medway	3,397	3	–	1	–	1	–	16	–	6	–	11	–	1	–	6	–	–	–	–	–	–
172	Ashland	3,326	15	–	3	–	6	–	6	–	1	–	–	–	–	–	1	–	–	–	–	–	–
173	Rehoboth	3,282	–	–	–	–	2	1	1	–	3	–	–	–	–	–	5	–	–	–	–	–	–
174	North Reading	3,270	2	–	13	–	13	–	3	–	6	–	3	–	4	–	1	–	–	–	–	–	–
175	Hanover	3,168	15	–	12	–	12	–	1	–	21	–	32	–	1	–	5	–	–	–	–	–	–
176	North Brookfield	3,121	3	–	1	–	6	1	10	–	2	–	3	–	–	–	–	–	–	–	–	–	–
177	Pepperell	3,119	11	–	11	–	2	–	23	–	12	–	–	–	–	–	3	–	–	–	–	–	–
178	Groton	3,106	–	–	11	–	3	–	2	–	4	–	1	–	3	–	39	–	–	–	–	–	–
179	Norton	3,096	3	–	2	–	23	–	3	–	3	–	–	–	–	–	–	–	–	–	–	–	–
180	Lancaster	3,092	6	–	–	–	4	–	11	–	17	–	22	–	10	–	12	–	–	–	–	–	–
181	Dighton	3,070	1	–	2	–	–	–	3	–	1	–	1	–	–	–	–	–	–	–	–	–	–
182	Lunenburg	3,058	1	–	1	–	6	–	6	–	4	–	1	–	4	–	14	–	–	–	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	SCARLET FEVER															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
183	Kingston	3,018	1	–	–	–	11	–	51	–	3	–	3	–	–	–	1	–
184	Burlington	3,017	7	–	6	–	1	–	19	–	28	–	–	–	1	–	–	–
185	Acton	3,004	–	–	11	–	4	–	–	–	2	–	1	–	1	–	3	–
186	Lenox	3,000	2	–	6	–	3	–	30	–	1	–	–	–	4	–	2	–
187	Hopkinton	2,991	16	–	8	–	2	–	3	–	7	–	2	–	1	–	–	–
188	Nahant	2,890	–	–	1	–	1	–	–	–	7	–	–	–	–	–	4	–
189	West Boylston	2,874	15	–	8	–	12	–	22	–	–	–	1	–	7	–	7	–
190	Nantucket	2,870	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–
191	Salisbury	2,828	2	–	3	–	–	–	2	–	2	–	7	–	5	–	3	–
192	Douglas	2,722	9	–	14	–	1	–	–	–	–	–	1	–	1	–	–	–
193	Avon	2,703	–	–	46	–	33	–	25	–	16	–	3	–	3	–	1	–
194	Hamilton	2,696	–	–	1	–	2	–	2	–	5	–	–	–	–	–	1	–
195	Hanson	2,695	9	–	–	–	13	–	10	–	–	–	–	–	1	–	3	–
196	Hadley	2,656	6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
197	Sutton	2,610	1	–	5	–	11	–	5	–	6	–	–	–	–	–	–	–
198	Yarmouth	2,608	1	–	4	–	1	–	–	–	3	–	–	–	1	–	–	–
199	Manchester	2,580	–	–	–	–	23	–	4	–	–	–	–	–	3	–	–	–
200	Duxbury	2,486	3	–	4	–	1	–	13	–	6	–	–	–	1	–	–	–
201	Townsend	2,479	10	–	–	–	10	–	20	–	2	–	–	–	–	–	2	–
202	Upton	2,479	4	–	18	–	8	–	1	–	2	–	3	–	–	–	2	–
203	Shirley	2,459	–	–	11	–	2	–	6	–	1	–	1	–	1	–	8	–
204	Middleton	2,456	6	–	2	–	1	–	–	–	7	–	6	–	–	–	1	–
205	Merrimac	2,425	–	–	2	–	2	–	–	–	14	–	8	–	–	–	11	–
206	Southboro	2,421	–	–	10	–	8	–	3	–	1	–	–	–	15	–	4	–
207	Sturbridge	2,420	3	–	9	–	3	–	1	–	–	–	1	–	1	–	5	–
208	Marshfield	2,405	1	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–
209	Norwell	2,393	–	–	–	–	2	–	2	–	1	–	2	–	–	–	–	–
210	Ashburnham	2,380	1	–	1	–	1	–	6	–	13	–	1	–	6	–	6	–
211	Millis	2,363	1	–	1	–	3	–	4	–	4	–	–	–	–	–	1	–
212	Mattapoisett	2,347	2	–	12	–	11	–	–	–	–	–	2	–	1	–	–	–
213	Sudbury	2,322	7	–	7	–	3	–	8	–	7	–	–	–	1	–	2	–
214	Plainville	2,278	–	–	–	–	15	–	1	–	–	–	1	–	–	–	2	–
215	Raynham	2,263	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
216	Chatham	2,241	–	–	–	–	2	–	3	–	5	–	–	–	–	–	–	–
217	Marion	2,216	2	–	19	–	6	–	10	–	5	–	1	–	29	–	5	–
218	Hatfield	2,188	–	–	2	–	6	–	5	–	–	–	–	–	–	–	–	–
219	Lincoln	2,179	2	–	2	–	13	–	2	–	–	–	2	–	–	–	–	–
220	Northfield	2,162	–	–	3	–	3	–	4	–	2	–	2	–	–	–	3	–
221	Westminster	2,153	–	–	–	–	–	–	3	–	1	–	–	–	1	–	4	–

222	Groveland	2,150	–	–	4	–	2	–	3	–	1	–	2	–	–	–	11	–
223	Southwick	2,141	2	–	9	–	3	–	–	–	1	–	7	–	–	–	4	–
224	Georgetown	2,122	3	–	12	–	1	–	14	–	–	–	–	–	–	–	3	–
225	Hardwick	2,115	5	–	6	–	5	–	7	–	1	–	–	–	–	–	3	–
226	Harwich	2,071	–	–	1	–	–	–	–	–	–	–	–	–	1	–	1	–
227	Sterling	2,043	1	–	10	–	8	–	2	–	6	–	3	–	3	–	8	–
228	Freetown	2,027	–	–	–	–	–	–	1	–	–	–	1	–	2	–	1	–
229	Norfolk	2,006	2	–	1	–	4	–	8	–	8	–	–	–	–	–	4	–
230	Williamsburg	1,980	3	–	1	–	13	–	–	–	1	–	1	–	6	–	–	–
231	Pembroke	1,917	–	–	–	–	6	–	21	–	2	–	1	–	1	–	3	–
232	Dennis	1,807	1	–	–	–	–	–	5	–	1	–	–	–	1	–	–	–
233	Sheffield	1,801	1	–	–	–	5	–	2	–	–	–	–	–	5	–	–	–
234	Lanesborough	1,754	–	–	–	–	15	–	6	–	1	–	2	–	2	–	2	–
235	Stockbridge	1,739	1	–	4	–	–	–	5	–	–	–	–	–	–	–	–	–
236	Dover	1,736	1	–	1	–	–	–	3	–	2	–	13	–	1	–	1	–
237	Tisbury	1,719	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
238	Cheshire	1,718	–	–	1	–	1	–	–	–	–	–	10	–	1	–	–	–
239	Essex	1,705	–	–	–	–	4	–	–	–	4	–	–	–	–	–	–	–
240	Newbury	1,677	–	–	1	–	–	–	–	–	–	–	–	–	2	–	1	–
241	Littleton	1,673	–	–	–	–	1	–	1	–	3	–	4	–	2	–	5	–
242	Sandwich	1,671	3	–	7	–	2	–	–	–	–	–	–	–	–	–	–	–
243	Shelburne	1,656	9	–	–	–	3	–	1	–	–	–	–	–	–	–	–	–
244	Mendon	1,650	–	–	1	–	–	–	6	–	2	–	–	–	–	–	–	–
245	Orleans	1,642	1	–	–	–	–	–	1	–	6	–	3	–	–	–	–	–
246	Rowley	1,626	–	–	18	–	7	–	22	–	6	–	5	–	4	–	2	–
247	Millville	1,616	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–
248	Rutland	1,561	–	–	1	–	–	–	–	–	–	–	–	–	3	–	5	–
249	Lakeville	1,555	1	–	2	–	4	–	8	–	3	–	3	–	1	–	–	–
250	Wenham	1,550	–	–	–	–	4	–	–	–	2	–	–	–	1	–	5	–
251	Buckland	1,525	1	–	3	–	2	–	8	–	1	–	–	–	–	–	–	–
252	West Brookfield	1,512	–	–	1	–	1	–	1	–	4	–	1	–	1	–	15	–
253	West Newbury	1,503	–	–	5	–	–	–	–	–	–	–	1	–	–	–	2	–
254	Tyngsborough	1,495	–	–	5	–	–	–	17	–	4	–	–	–	5	–	3	–
255	Colrain	1,455	6	–	2	–	5	–	1	–	5	–	–	–	–	–	–	–
256	Clarksburg	1,450	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
257	Stow	1,427	–	–	2	–	–	–	5	–	–	–	–	–	–	–	–	–
258	Brookfield	1,390	–	–	–	–	5	–	5	–	10	–	5	–	–	–	1	–
259	Carver	1,383	3	–	–	–	1	–	3	–	11	–	1	–	1	–	–	–
260	Oak Bluffs	1,345	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
261	Hinsdale	1,325	–	–	–	–	–	–	10	–	–	–	–	–	–	–	–	–
262	Erving	1,315	2	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
263	Boylston	1,313	–	–	–	–	1	–	3	–	–	–	–	–	1	–	6	–
264	Edgartown	1,296	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
265	Hampden	1,256	3	–	4	–	3	–	–	–	–	–	3	–	–	–	1	–
266	Southampton	1,254	2	–	–	–	3	–	1	–	2	–	–	–	7	–	1	–
267	Chester	1,252	3	–	4	–	–	–	5	–	–	–	–	–	–	–	–	–
268	Huntington	1,242	6	–	1	–	–	–	1	–	2	–	–	–	–	–	–	–
269	Berkley	1,231	–	–	–	–	–	–	1	–	–	–	–	–	–	–	2	–
270	Russell	1,221	7	–	4	–	3	–	1	–	–	–	–	–	–	–	1	–
271	Granby	1,193	–	–	–	–	–	–	2	–	1	–	–	–	–	–	–	–
272	Berlin	1,174	2	–	4	–	2	–	–	–	–	–	–	–	–	–	–	–
273	Ashby	1,155	–	–	2	–	–	–	10	–	–	–	1	–	1	–	3	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	SCARLET FEVER															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
274	Topsfield	1,153	1	–	2	–	1	–	3	–	–	–	–	–	4	–	5	–
275	East Brookfield	1,125	–	–	2	–	8	–	–	–	4	–	1	–	–	–	–	–
276	Rochester	1,107	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
277	Halifax	1,093	–	–	–	–	–	–	–	–	–	–	2	–	1	–	1	–
278	Bernardston	1,070	1	–	3	–	–	–	–	–	5	–	–	–	1	–	–	–
279	Harvard	1,065	–	–	2	–	–	–	1	–	4	–	–	–	–	–	1	–
280	West Stockbridge	1,059	2	–	–	–	1	–	–	–	–	–	–	–	3	–	1	–
281	Sherborn	1,036	–	–	–	–	2	–	1	–	–	–	–	–	–	–	–	–
282	Hubbardston	1,019	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
283	Sunderland	1,018	4	–	–	–	–	–	20	–	–	–	–	–	1	–	1	–
284	Princeton	1,012	1	–	1	–	–	–	1	–	5	–	1	–	2	–	1	–
285	Ashfield	981	–	–	1	–	1	–	4	–	–	–	–	–	–	–	1	–
286	Brimfield	975	–	–	–	–	1	–	–	–	–	–	–	–	6	–	2	–
287	Whately	973	10	1	–	–	–	–	–	–	1	–	–	–	–	–	1	–
288	Gill	918	–	–	1	–	1	–	4	–	–	–	3	–	–	–	–	–
289	Bolton	905	2	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
290	Paxton	905	2	–	2	–	2	–	5	–	–	–	1	–	2	–	–	–
291	New Marlboro	896	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
292	Conway	867	–	–	2	–	1	–	–	–	–	–	1	–	–	–	–	–
293	Boxford	852	1	–	–	–	–	–	–	–	–	–	2	–	–	–	6	–
294	Wellfleet	851	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
295	Charlemont	812	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
296	Brewster	757	–	–	3	–	–	–	2	–	–	–	2	–	8	–	–	–
297	Royalston	750	–	–	–	–	4	–	–	–	–	–	–	–	–	–	–	–
298	Petersham	743	6	–	1	–	–	–	–	–	1	–	8	–	–	–	2	–
299	Carlisle	697	–	–	–	–	–	–	5	–	–	–	–	–	2	–	–	–
300	Becket	682	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
301	Egremont	660	–	–	–	–	3	–	–	–	–	–	1	–	–	–	–	–
302	Granville	656	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
303	Richmond	646	1	–	1	–	–	–	1	–	–	–	1	–	–	–	4	–
304	Eastham	604	9	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
305	Leverett	594	9	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–
306	Truro	582	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
307	Blandford	572	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
308	Plympton	545	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–
309	Cummington	532	–	–	–	–	1	–	8	–	–	–	–	–	–	–	–	–
310	Pelham	512	1	–	12	–	–	–	–	–	–	–	–	–	–	–	–	–
311	Phillipston	475	7	–	–	–	–	–	–	–	7	–	2	–	–	–	2	–
312	Dunstable	440	2	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–

313	Oakham	424	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
314	Westhampton . . .	413	4	–	–	–	–	–	–	–	3	–	–	–	3	–	–	–
315	New Braintree . . .	409	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
316	Florida	401	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
317	Warwick	401	–	–	1	–	–	–	–	–	–	–	1	–	1	–	1	–
318	Otis	377	2	–	2	–	2	–	–	–	2	–	–	–	1	–	1	–
319	Chesterfield . . .	375	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
320	Sandisfield . . .	370	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
321	New Salem . . .	364	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–
322	Worthington . . .	363	–	–	–	–	–	–	4	–	–	–	–	–	–	–	–	–
323	Boxborough . . .	358	1	–	–	–	–	–	–	–	–	–	–	–	1	–	2	–
324	Wales	354	–	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–
325	Hancock	349	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
326	Wendell	348	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
327	Mashpee	343	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–
328	Goshen	328	–	–	–	–	8	–	–	–	–	–	–	–	–	–	–	–
329	Heath	327	20	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
330	Monterey	305	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
331	Savoy	294	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
332	Windsor	274	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
333	Holland	265	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
334	Leyden	254	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
335	Washington . . .	242	–	–	1	–	–	–	–	–	2	–	–	–	–	–	–	–
336	West Tisbury . . .	239	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
337	Chilmark	230	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
338	Middlefield . . .	226	2	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
339	Plainfield	224	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
340	Tyringham . . .	211	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
341	Alford	207	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
342	Hawley	203	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
343	Shutesbury . . .	201	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
344	Rowe	178	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
345	Monroe	171	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
346	Montgomery . . .	137	–	–	2	–	3	–	–	–	–	–	–	–	–	–	–	–
347	Peru	116	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
348	Gay Head	114	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
349	Tolland	111	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
350	Gosnold	107	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
351	New Ashford . . .	99	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
352	Mt Washington . .	53	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
353	Tewksbury State Hospital .		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
354	Military Establishments .		60	–	448	–	285	–	127	–	47	–	–	–	–	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities*

Line No.	Cities and Towns in Order of Population	Population estimated as of July 1, 1949	SYPHILIS															
			1942		1943		1944		1945		1946		1947		1948		1948	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
1	Massachusetts	4,660,546	5,697	248	5,520	301	5,068	233	4,378	189	4,970	183	3,211	178	2,313	161	2,043	105
2	Boston	766,386	2,057	63	1,870	70	1,736	57	1,603	45	1,733	51	1,326	41	925	42	804	28
3	Worcester	203,171	159	11	127	17	96	9	117	11	132	7	131	5	70	11	67	7
4	Springfield	168,955	271	5	299	17	233	9	204	9	274	7	184	11	116	6	106	6
5	Fall River	115,062	74	7	79	6	76	4	68	7	100	3	38	5	40	7	36	1
6	Cambridge	111,305	182	6	160	10	153	8	144	4	140	6	81	8	53	5	58	4
7	Lynn	111,305	119	5	125	6	107	9	79	4	115	3	46	7	36	4	42	2
8	New Bedford	110,308	163	5	170	11	150	9	135	6	146	6	103	1	75	5	77	4
9	Somerville	109,135	109	7	94	8	94	1	73	6	82	5	52	1	48	2	31	–
10	Lowell	101,229	109	5	85	10	98	4	69	3	81	6	45	8	26	5	28	4
11	Quincy	87,584	57	3	66	3	44	2	39	4	58	1	26	2	22	4	21	4
12	Lawrence	86,714	83	6	94	10	76	7	81	3	104	4	45	6	30	8	36	1
13	Newton	83,715	47	2	41	1	48	4	28	1	33	–	29	2	19	–	16	1
14	Medford	70,548	53	–	50	3	56	1	34	–	37	2	22	1	24	3	19	–
15	Brockton	67,706	81	5	41	4	57	3	52	3	58	3	32	1	16	2	20	1
16	Brookline	63,221	52	1	41	–	34	–	37	2	40	2	29	2	19	2	26	–
17	Malden	60,922	50	3	56	1	46	–	49	3	50	–	34	2	16	3	16	1
18	Pittsfield	56,931	47	4	42	3	23	3	13	1	43	1	31	3	17	1	14	1
19	Holyoke	53,775	49	3	53	3	59	2	60	2	63	1	41	3	23	1	22	–
20	Everett	50,088	58	6	45	1	33	1	29	2	33	2	17	–	12	–	11	–
21	Chicopee	47,219	27	2	17	3	15	1	16	2	27	2	16	3	5	1	4	2
22	Waltham	46,693	35	2	34	2	38	3	23	3	34	2	21	2	8	2	9	–
23	Arlington	46,541	26	1	22	3	13	3	16	–	14	2	13	1	8	2	6	–
24	Haverhill	46,162	68	5	50	3	41	3	28	3	102	3	39	3	21	2	13	2
25	Fitchburg	45,447	31	2	31	–	18	6	29	2	36	1	17	–	14	–	20	–
26	Salem	44,232	30	4	36	1	30	1	24	1	45	1	18	1	18	3	12	–
27	Chelsea	39,940	37	2	35	3	37	1	45	3	38	1	26	3	20	1	22	1
28	Taunton	39,661	45	–	25	1	20	1	44	1	52	–	21	1	32	–	13	–
29	Watertown	39,199	27	–	25	4	30	2	26	–	27	1	9	–	11	–	8	–
30	Revere	36,805	42	1	54	4	28	1	34	–	25	–	17	1	15	–	21	–
31	Weymouth	31,556	18	1	18	4	8	3	8	–	12	1	20	1	7	–	6	2
32	Belmont	30,627	20	–	9	3	9	–	7	1	13	–	8	–	7	–	4	–
33	Melrose	30,274	15	1	6	1	11	1	5	1	11	1	5	–	2	–	3	–
34	Beverly	27,925	19	1	9	2	18	3	22	1	23	–	6	1	3	–	5	–
35	Framingham	27,489	15	1	25	2	33	1	14	1	17	1	14	2	7	–	11	1
36	Gloucester	25,562	24	1	24	2	19	2	16	–	15	–	10	–	7	–	8	3
37	Northampton	25,129	18	2	6	1	12	5	3	2	19	2	11	2	4	2	13	–
38	Leominster	24,697	34	1	23	1	15	1	19	1	18	4	11	2	9	1	7	–
39	Milton	24,366	13	1	12	–	8	1	8	1	8	–	3	–	2	–	3	1

40	Methuen	24,271	14	1	13	1	22	2	6	–	19	–	7	–	3	–	1	–
41	Braintree	23,675	14	1	9	–	7	1	8	–	8	1	3	1	7	2	2	–
42	Peabody	22,797	18	–	16	3	16	–	9	–	20	1	9	1	5	–	5	–
43	Attleboro	22,621	19	1	16	3	13	1	9	2	17	1	6	–	7	2	10	1
44	North Adams	22,230	12	2	14	1	19	–	22	1	32	1	18	–	8	1	11	–
45	West Springfield	21,500	26	2	16	–	12	2	15	1	14	–	7	–	9	–	7	–
46	Westfield	20,963	14	1	15	1	7	–	8	–	22	2	7	–	6	–	3	–
47	Wakefield	20,845	7	–	9	–	3	1	1	1	9	1	3	–	1	–	1	1
48	Winthrop	20,422	15	2	14	–	14	–	10	–	6	2	7	–	8	–	3	–
49	Gardner	20,300	5	1	7	–	6	–	8	1	18	–	6	2	1	–	5	2
50	Woburn	19,976	10	1	11	–	21	–	19	1	20	–	4	–	8	–	6	1
51	Wellesley	19,720	12	1	4	–	8	1	5	–	4	–	5	2	3	–	–	–
52	Saugus	18,267	15	1	17	–	13	–	14	–	11	–	8	1	5	–	5	–
53	Southbridge	18,217	17	2	12	2	7	–	10	–	13	1	5	–	1	1	2	–
54	Greenfield	18,182	19	1	11	3	8	1	9	1	15	–	7	1	4	2	4	–
55	Dedham	17,644	10	–	5	–	10	–	7	–	18	1	5	–	7	–	6	1
56	Natick	17,505	9	1	9	5	7	–	7	–	7	–	3	–	4	–	1	–
57	Norwood	17,493	10	1	2	–	8	–	5	–	6	1	4	1	1	–	1	1
58	Needham	16,307	6	–	5	1	4	–	3	–	5	–	1	–	3	1	2	–
59	Milford	16,147	14	2	15	1	10	3	5	1	21	–	7	–	2	–	3	2
60	Marlborough	16,132	19	–	5	3	6	1	2	–	4	–	6	1	10	–	7	2
61	Lexington	15,536	10	–	9	–	6	–	3	–	8	–	4	–	–	–	2	–
62	Winchester	15,481	4	1	4	–	6	–	5	–	14	–	10	–	1	–	–	1
63	Danvers	15,025	4	1	6	2	9	–	7	1	10	–	2	1	1	–	7	–
64	Newburyport	14,223	13	1	17	–	15	2	17	2	7	–	8	1	10	–	5	–
65	Marblehead	13,964	6	2	7	–	2	1	4	–	4	–	5	–	2	–	2	–
66	Plymouth	13,943	8	2	8	1	10	1	12	1	19	1	8	1	4	1	5	–
67	Webster	13,826	6	–	11	–	10	–	7	–	14	–	5	–	3	–	2	–
68	Reading	13,637	2	–	6	–	1	–	6	–	2	–	2	1	5	–	3	–
69	Stoneham	13,116	7	1	9	–	4	–	5	1	7	–	6	1	3	–	3	–
70	Fairhaven	13,072	10	–	9	1	8	1	13	–	12	–	9	–	5	1	4	–
71	Clinton	12,991	9	–	2	–	7	–	6	–	12	–	10	–	2	–	1	–
72	Adams	12,821	12	2	10	–	4	1	5	–	12	1	5	–	1	–	2	–
73	Swampscott	12,781	6	2	2	–	3	–	5	–	7	–	1	–	1	2	1	–
74	Andover	12,620	4	–	5	2	4	–	1	–	6	–	1	–	5	–	3	–
75	North Attleboro	12,601	4	–	6	2	4	–	2	2	11	–	3	–	2	–	–	–
76	Athol	12,351	6	–	5	1	3	–	3	–	12	–	9	–	6	–	4	–
77	Hingham	11,132	9	2	11	2	4	–	2	–	5	–	1	–	2	1	3	–
78	Easthampton	10,830	7	–	2	–	2	–	5	–	8	–	1	2	2	1	1	–
79	Amesbury	10,824	14	–	6	–	8	–	8	–	12	–	5	–	6	–	3	–
80	Shrewsbury	10,791	2	1	8	1	–	1	1	–	3	1	–	–	1	–	1	–
81	Dartmouth	10,712	6	–	5	–	10	1	10	–	10	–	4	–	1	1	1	–
82	Northbridge	10,212	4	–	1	–	–	–	1	–	4	–	4	1	–	–	–	–
83	Palmer	10,211	4	–	7	1	6	–	7	–	6	–	3	–	1	–	3	–
84	Middleborough	10,099	8	–	3	1	4	–	4	2	6	1	2	–	1	–	3	–
85	Stoughton	9,470	2	–	1	–	3	1	1	–	3	–	5	–	2	–	4	–
86	Chelmsford	9,268	2	–	3	–	1	–	–	–	2	–	2	–	1	–	–	–
87	Walpole	9,258	1	–	4	1	1	–	4	–	3	–	2	–	2	–	–	–
88	Randolph	9,210	2	–	8	–	7	–	5	–	3	–	3	–	5	–	–	–
89	Rockland	9,053	8	–	8	–	5	1	6	–	6	1	–	–	3	1	–	–
90	Billerica	9,001	3	–	5	–	3	–	1	–	9	–	1	–	2	–	4	–
91	Auburn	8,958	–	–	5	–	7	–	3	–	4	–	3	–	1	–	3	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population estimated as of July 1, 1949	SYPHILIS															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
92	Barnstable	8,943	8	3	12	–	6	–	6	2	12	–	2	2	5	1	10	2
93	Agawam	8,915	14	–	3	–	4	–	3	1	2	–	6	–	3	–	–	–
94	Concord	8,743	3	–	4	1	3	–	1	–	3	–	1	–	–	–	5	–
95	Whitman	8,740	8	–	3	–	2	–	4	–	4	–	–	–	2	–	4	–
96	Bridgewater	8,641	3	–	6	–	4	–	4	1	8	1	13	–	7	–	6	–
97	Falmouth	8,489	24	2	16	–	13	2	6	1	10	–	8	1	4	2	4	–
98	Grafton	8,425	6	–	3	–	4	–	1	–	–	–	5	1	1	–	3	–
99	Wareham	8,392	23	2	28	2	13	–	29	1	28	–	14	–	10	–	10	1
100	North Andover	8,286	2	–	3	1	–	1	3	–	6	–	–	1	1	–	–	–
101	Millbury	8,268	4	–	3	–	6	1	4	1	8	–	4	1	5	1	2	–
102	Hudson	8,171	6	–	3	1	9	–	3	–	4	–	3	–	5	–	3	–
103	Ludlow	8,065	1	–	4	–	–	1	4	–	4	1	–	–	–	–	1	–
104	South Hadley	7,809	1	–	4	–	5	–	1	–	3	–	2	–	–	–	–	–
105	Franklin	7,735	4	1	4	–	7	2	2	–	6	–	2	–	1	–	3	–
106	Amherst	7,696	5	–	7	2	4	–	4	–	5	–	3	–	1	–	8	–
107	Somerset	7,668	4	–	4	–	2	–	1	–	1	–	2	–	1	–	1	–
108	Montague	7,602	2	–	2	–	11	–	1	–	1	1	3	–	3	–	2	–
109	Ware	7,578	5	1	3	–	–	–	9	1	4	–	–	–	2	1	2	–
110	Dracut	7,524	4	–	3	1	2	–	–	–	2	–	–	–	–	–	2	–
111	Mansfield	7,380	4	–	8	–	5	1	–	1	9	–	2	–	3	–	3	–
112	Maynard	7,198	4	–	2	–	8	–	1	–	2	–	3	–	3	–	5	–
113	Canton	7,010	8	–	2	1	1	–	4	1	3	1	1	–	5	–	6	–
114	Abington	6,963	6	–	5	–	2	–	7	–	2	–	–	1	3	1	–	–
115	Longmeadow	6,957	2	–	1	1	3	1	–	–	2	–	1	–	3	–	1	–
116	Westborough	6,866	13	–	8	–	5	–	2	–	5	–	5	–	2	–	–	–
117	Ipswich	6,857	4	1	2	–	5	–	4	–	7	–	2	–	7	–	–	–
118	Spencer	6,856	1	–	3	1	–	1	1	–	2	–	1	–	2	1	–	–
119	Uxbridge	6,836	7	–	14	–	3	–	3	1	6	–	4	–	1	–	1	–
120	Foxborough	6,627	5	–	8	–	1	1	4	–	7	–	–	1	4	–	–	1
121	Great Barrington	6,581	10	–	7	–	3	–	3	–	5	–	1	–	–	–	1	–
122	Winchendon	6,461	3	–	3	1	5	–	4	–	4	–	3	–	2	–	–	–
123	Wilmington	6,377	9	–	1	–	5	–	5	1	3	–	1	–	–	–	3	–
124	Swansea	6,319	5	–	6	–	1	–	3	–	4	–	2	–	3	–	1	–
125	Easton	6,223	6	1	3	–	2	–	2	–	3	–	2	–	3	–	3	–
126	Westwood	6,053	1	–	2	–	2	–	–	–	1	–	1	–	–	–	1	–
127	Tewksbury	5,949	3	–	7	–	5	–	2	–	5	–	2	–	3	–	2	–
128	Orange	5,907	2	–	7	1	2	–	2	–	4	–	4	–	2	–	3	1
129	Monson	5,713	8	–	–	–	1	–	3	–	2	–	1	–	2	–	1	–
130	Holden	5,648	–	–	–	–	–	1	2	–	2	–	2	–	4	–	–	–

131	Seekonk	5,552	4	1	–	2	–	1	8	1	–	1	3	1	1	1	–	–
132	Scituate	5,526	8	1	2	1	15	–	6	–	4	–	5	–	2	–	–	–
133	Wrentham	5,437	2	1	–	–	–	–	1	–	1	–	6	1	1	–	4	–
134	Leicester	5,409	5	3	4	1	1	–	2	1	–	–	2	–	1	–	2	–
135	Oxford	5,368	5	–	3	1	4	–	1	–	1	–	–	–	–	–	2	1
136	Westport	5,297	4	–	2	–	8	1	2	–	6	–	3	–	1	–	–	–
137	Weston	5,241	6	–	1	–	1	1	–	–	2	–	1	–	–	–	–	–
138	Williamstown	4,919	1	1	5	–	3	–	1	–	2	–	–	–	1	–	3	1
139	Dudley	4,816	1	–	6	–	3	–	2	1	1	–	–	–	2	–	–	–
140	Dalton	4,517	–	–	1	–	2	–	2	–	3	–	2	1	1	–	–	–
141	Bedford	4,486	4	3	3	3	2	5	4	–	4	5	2	4	1	–	1	–
142	Lee	4,444	–	1	11	1	–	–	1	–	2	–	2	–	1	–	1	–
143	Hull	4,437	4	–	4	–	2	–	3	–	1	1	5	–	1	1	2	–
144	Templeton	4,435	2	–	1	1	1	–	1	–	–	–	–	–	–	–	–	–
145	Rockport	4,403	2	–	1	–	–	–	3	–	–	–	6	–	2	–	1	–
146	Sharon	4,379	3	–	3	1	1	–	1	1	–	–	–	–	1	–	1	–
147	Acushnet	4,370	2	1	2	–	1	–	1	1	3	–	3	–	1	–	2	–
148	Blackstone	4,349	1	1	3	–	–	–	–	–	–	–	1	–	2	–	2	–
149	Ayer	4,328	9	–	4	–	8	–	9	–	3	–	1	–	2	–	2	–
150	Wayland	4,262	3	–	5	–	3	1	5	–	3	–	1	–	2	–	–	–
151	Medfield	4,199	2	–	1	–	2	1	1	–	1	–	4	–	–	–	–	–
152	East Longmeadow	4,163	3	–	2	–	2	1	1	1	3	–	–	–	–	–	1	–
153	East Bridgewater	4,158	4	–	2	–	4	–	1	–	4	–	3	–	2	–	2	–
154	Holbrook	4,056	6	–	4	–	1	–	3	–	–	–	3	–	5	–	3	–
155	Belchertown	4,021	–	–	2	–	–	–	2	–	–	–	–	–	–	–	1	–
156	Cohasset	3,947	2	1	2	–	5	–	3	–	2	–	–	–	1	–	–	–
157	Bellingham	3,935	–	–	–	–	–	–	2	1	1	1	2	1	–	–	1	–
158	West Bridgewater	3,905	1	1	4	–	–	–	7	–	3	–	1	–	2	–	–	–
159	Westford	3,815	3	–	3	–	–	–	–	–	1	–	–	–	1	–	–	–
160	Bourne	3,716	3	–	11	–	6	1	3	–	5	1	3	–	3	3	4	–
161	Holliston	3,582	1	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–
162	Provincetown	3,564	2	–	3	–	3	–	2	–	1	1	–	–	3	–	1	–
163	Hopedale	3,518	3	–	–	–	3	–	1	–	3	–	2	1	–	–	–	–
164	Charlton	3,507	–	–	–	–	3	–	1	–	5	1	2	–	–	–	–	–
165	Warren	3,498	–	–	–	1	4	–	1	1	1	–	–	1	–	–	1	–
166	Barre	3,485	2	–	–	–	1	–	–	–	3	–	2	–	1	1	–	–
167	Lynnfield	3,476	3	1	–	–	–	–	–	–	–	–	1	–	1	–	–	–
168	Northboro	3,450	–	–	1	–	–	–	1	–	6	1	1	–	–	–	–	–
169	Wilbraham	3,442	1	–	–	–	1	–	–	–	1	–	1	–	2	1	–	–
170	Deerfield	3,422	3	–	1	–	7	–	1	–	–	–	2	–	2	–	–	–
171	Medway	3,397	1	–	1	–	–	–	–	–	1	–	–	–	–	–	2	1
172	Ashland	3,326	–	1	1	1	1	–	–	–	2	–	–	–	–	–	–	–
173	Rehoboth	3,282	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–
174	North Reading	3,270	1	–	2	–	1	–	–	–	2	–	1	–	1	–	1	–
175	Hanover	3,168	2	–	4	–	1	–	–	–	1	2	–	1	–	–	1	–
176	North Brookfield	3,121	5	–	1	–	1	–	1	–	–	–	–	–	–	–	–	–
177	Pepperell	3,119	2	–	–	1	2	–	4	–	7	1	–	–	1	–	–	2
178	Groton	3,106	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	1
179	Norton	3,096	1	–	–	–	2	–	6	–	7	–	3	–	3	–	–	–
180	Lancaster	3,092	2	–	2	1	4	–	1	–	1	–	1	–	2	–	–	–
181	Dighton	3,070	2	–	10	–	7	–	12	–	3	–	–	–	–	–	1	–
182	Lunenburg	3,058	–	–	1	–	–	–	1	–	–	–	1	–	–	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	SYPHILIS															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
183	Kingston	3,018	1	–	–	1	1	–	8	–	3	–	3	–	1	–	–	–
184	Burlington	3,017	2	–	2	–	2	–	1	–	5	–	–	1	–	–	–	–
185	Acton	3,004	1	–	2	–	–	–	3	–	1	–	–	–	–	–	2	–
186	Lenox	3,000	4	–	4	–	2	–	2	–	2	–	2	1	1	–	1	–
187	Hopkinton	2,991	1	–	2	–	–	–	6	–	–	–	–	–	–	–	1	–
188	Nahant	2,890	2	1	3	–	4	–	1	–	–	–	–	–	1	–	–	–
189	West Boylston	2,874	–	–	–	–	2	–	1	–	–	–	3	–	–	–	–	–
190	Nantucket	2,870	1	1	1	–	3	–	4	–	4	1	1	1	1	–	1	1
191	Salisbury	2,828	3	–	2	–	2	–	3	–	–	1	–	–	2	–	3	–
192	Douglas	2,722	1	1	–	–	–	–	–	–	1	–	–	–	–	–	–	–
193	Avon	2,703	–	–	–	–	2	–	1	–	–	–	–	–	1	–	–	–
194	Hamilton	2,696	4	–	–	–	–	1	1	–	1	–	4	–	–	–	–	–
195	Hanson	2,695	5	–	2	–	3	2	3	1	4	–	5	–	3	–	1	–
196	Hadley	2,656	2	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
197	Sutton	2,610	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
198	Yarmouth	2,608	4	–	3	–	–	1	–	–	1	–	1	–	–	–	–	–
199	Manchester	2,580	4	–	1	–	1	–	–	–	3	1	2	–	1	–	–	–
200	Duxbury	2,486	2	–	9	–	4	–	–	2	5	1	1	–	1	1	1	–
201	Townsend	2,479	2	–	–	–	1	–	–	–	1	–	1	–	1	–	–	–
202	Upton	2,479	–	–	1	–	–	–	2	–	1	–	–	1	–	–	–	–
203	Shirley	2,459	4	–	1	–	–	–	–	–	–	–	–	–	–	–	2	–
204	Middleton	2,456	4	–	2	–	1	–	3	–	1	–	1	–	1	–	1	–
205	Merrimac	2,425	1	–	–	–	–	1	3	–	1	–	1	–	1	–	1	–
206	Southboro	2,421	–	–	4	–	3	–	1	–	–	–	–	–	–	–	1	–
207	Sturbridge	2,420	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
208	Marshfield	2,405	4	–	5	–	1	–	1	–	5	–	3	–	–	–	1	–
209	Norwell	2,393	6	–	1	–	–	–	–	–	1	–	1	–	2	–	–	–
210	Ashburnham	2,380	6	–	1	–	–	–	–	–	1	1	–	–	3	–	–	–
211	Millis	2,363	1	–	3	–	–	–	4	–	2	–	2	–	–	–	3	–
212	Mattapoisett	2,347	–	–	–	–	–	–	2	–	6	–	2	–	3	–	–	–
213	Sudbury	2,322	1	–	–	–	1	–	2	–	4	–	–	–	–	–	–	–
214	Plainville	2,278	–	–	1	–	–	–	2	–	1	1	1	–	–	–	–	–
215	Raynham	2,263	1	–	–	1	1	–	–	–	6	–	3	–	2	–	–	–
216	Chatham	2,241	–	–	1	–	2	–	–	–	2	2	1	–	3	–	–	–
217	Marion	2,216	4	–	2	1	3	–	1	–	1	2	7	–	–	–	–	–
218	Hatfield	2,188	2	–	2	–	–	–	3	–	1	–	–	–	–	–	1	–
219	Lincoln	2,179	–	–	1	–	–	–	2	–	2	–	–	–	1	–	1	–
220	Northfield	2,162	–	–	–	–	–	–	2	–	1	–	–	–	–	–	1	–
221	Westminster	2,153	4	–	1	–	–	–	–	–	–	–	4	1	1	–	3	–

222	Groveland	2,150	1	–	–	2	–	–	1	–	3	–	1	–	–	–	1	–
223	Southwick	2,141	4	–	1	–	2	–	1	–	–	–	2	–	4	–	3	1
224	Georgetown	2,122	–	–	–	1	2	–	–	–	–	–	–	–	–	–	–	–
225	Hardwick	2,115	1	–	–	–	1	1	1	–	–	–	1	–	–	–	–	–
226	Harwich	2,071	4	–	2	1	4	1	–	–	9	–	1	–	3	–	2	–
227	Sterling	2,043	1	–	2	–	–	–	1	–	–	1	–	–	–	1	–	–
228	Freetown	2,027	1	–	3	–	3	–	3	–	1	–	–	–	–	–	–	–
229	Norfolk	2,006	–	–	–	–	–	–	1	–	1	–	1	–	–	–	–	–
230	Williamsburg	1,980	1	–	–	–	3	–	1	–	3	–	–	–	1	–	–	–
231	Pembroke	1,917	1	–	4	–	3	–	2	–	2	1	1	–	1	–	–	–
232	Dennis	1,807	1	–	1	–	–	–	2	–	–	–	–	–	2	–	1	–
233	Sheffield	1,801	–	–	3	1	–	–	–	–	–	–	–	–	1	–	1	–
234	Lanesborough	1,754	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–
235	Stockbridge	1,739	3	–	–	–	–	–	–	–	–	–	1	–	3	–	–	–
236	Dover	1,736	1	–	1	–	1	–	1	–	2	–	–	–	1	–	–	–
237	Tisbury	1,719	–	–	1	–	3	–	–	–	2	–	1	–	–	–	2	–
238	Cheshire	1,718	–	–	–	–	–	2	1	–	–	–	–	–	–	–	–	–
239	Essex	1,705	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
240	Newbury	1,677	–	–	1	–	1	–	–	–	–	–	1	–	1	–	–	1
241	Littleton	1,673	1	–	–	–	2	–	2	–	1	–	–	–	4	–	–	–
242	Sandwich	1,671	1	–	–	–	1	1	–	–	–	–	1	–	–	–	–	–
243	Shelburne	1,656	1	–	–	–	3	–	–	–	1	–	2	–	1	–	–	–
244	Mendon	1,650	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
245	Orleans	1,642	1	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–
246	Rowley	1,626	1	–	–	–	2	1	–	1	–	–	3	–	–	–	–	–
247	Millville	1,616	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	1
248	Rutland	1,561	–	–	2	–	–	1	3	–	–	–	–	–	–	–	–	–
249	Lakeville	1,555	3	–	1	–	–	–	1	–	1	–	4	–	2	–	–	–
250	Wenham	1,550	–	–	1	–	–	–	–	–	2	–	1	–	–	–	–	–
251	Buckland	1,525	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
252	West Brookfield	1,512	–	–	2	–	1	–	–	–	–	–	–	–	–	–	–	–
253	West Newbury	1,503	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–
254	Tyngsborough	1,495	3	–	1	–	1	–	–	–	–	–	2	–	–	–	1	–
255	Colrain	1,455	1	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
256	Clarksburg	1,450	1	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–
257	Stow	1,427	1	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–
258	Brookfield	1,390	–	–	3	–	–	–	–	1	–	1	–	–	–	–	–	–
259	Carver	1,383	4	2	2	–	7	–	5	–	5	–	2	2	3	1	–	–
260	Oak Bluffs	1,345	1	1	1	–	–	–	1	–	1	1	2	–	–	1	–	–
261	Hinsdale	1,325	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
262	Erving	1,315	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
263	Boylston	1,313	1	–	–	–	–	–	1	–	1	–	1	–	–	–	–	–
264	Edgartown	1,296	1	–	2	–	–	–	–	–	2	–	–	–	–	–	–	–
265	Hampden	1,256	–	–	–	–	2	–	–	1	1	–	–	–	–	–	–	–
266	Southampton	1,254	–	–	2	–	–	–	–	–	1	–	–	–	–	–	–	–
267	Chester	1,252	–	–	1	–	1	–	1	–	4	–	1	–	1	–	–	–
268	Huntington	1,242	–	–	1	–	–	–	1	1	2	–	–	–	1	–	–	–
269	Berkley	1,231	1	–	–	–	1	–	–	–	1	–	–	–	–	1	–	–
270	Russell	1,221	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–
271	Granby	1,193	1	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–
272	Berlin	1,174	–	–	–	–	1	–	–	–	2	–	–	–	–	–	–	–
273	Ashby	1,155	2	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	SYPHILIS															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
274	Topsfield	1,153	–	–	–	1	–	–	–	–	2	–	1	–	–	–	–	–
275	East Brookfield	1,125	–	–	–	–	1	–	2	–	1	–	–	–	–	–	–	–
276	Rochester	1,107	–	–	1	–	1	–	2	–	2	–	–	–	–	–	–	–
277	Halifax	1,093	2	–	–	–	–	–	2	–	–	–	–	–	1	–	1	–
278	Bernardston	1,070	–	–	–	–	–	–	1	–	–	–	–	–	–	–	3	–
279	Harvard	1,065	1	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
280	West Stockbridge	1,059	2	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
281	Sherborn	1,036	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
282	Hubbardston	1,019	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
283	Sunderland	1,018	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
284	Princeton	1,012	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
285	Ashfield	981	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
286	Brimfield	975	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
287	Whately	973	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
288	Gill	918	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
289	Bolton	905	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
290	Paxton	905	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
291	New Marlboro	896	–	1	3	–	–	–	1	–	–	–	–	–	–	–	–	–
292	Conway	867	1	–	3	–	1	–	–	1	–	–	–	–	2	–	2	–
293	Boxford	852	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
294	Wellfleet	851	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
295	Charlemont	812	–	–	–	–	–	–	–	–	3	–	2	–	–	–	3	–
296	Brewster	757	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
297	Royalston	750	–	–	2	–	–	–	–	–	1	–	–	–	–	–	1	–
298	Petersham	743	–	–	–	–	–	–	–	–	1	–	–	–	–	1	–	–
299	Carlisle	697	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
300	Becket	682	–	–	2	–	1	–	1	–	–	–	–	–	–	–	–	–
301	Egremont	660	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
302	Granville	656	1	1	–	–	–	–	–	1	–	–	1	–	–	–	–	–
303	Richmond	646	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
304	Eastham	604	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
305	Leverett	594	–	–	1	–	–	–	1	–	1	–	–	–	–	–	–	–
306	Truro	582	–	–	2	–	1	–	1	–	–	–	–	–	–	–	1	–
307	Blandford	572	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
308	Plympton	545	–	–	–	–	–	–	–	–	1	–	–	–	2	–	1	–
309	Cummington	532	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
310	Pelham	512	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
311	Phillipston	475	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
312	Dunstable	440	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

313	Oakham	424	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
314	Westhampton	413	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–
315	New Braintree	409	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–
316	Florida	401	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–
317	Warwick	401	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
318	Otis	377	2	–	3	–	–	–	–	–	4	–	–	–	–	–	1	–
319	Chesterfield	375	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
320	Sandisfield	370	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
321	New Salem	364	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
322	Worthington	363	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
323	Boxborough	358	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
324	Wales	354	–	–	–	–	–	–	–	–	–	–	–	–	1	–	2	–
325	Hancock	349	–	–	–	–	–	–	–	1	–	–	–	–	1	–	–	–
326	Wendell	348	–	–	–	–	–	–	–	–	–	1	–	–	1	–	–	–
327	Mashpee	343	2	–	6	–	2	–	4	1	2	–	2	1	1	–	–	–
328	Goshen	328	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
329	Heath	327	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
330	Monterey	305	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
331	Savoy	294	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
332	Windsor	274	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
333	Holland	265	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
334	Leyden	254	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
335	Washington	242	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
336	West Tisbury	239	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
337	Chilmark	230	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
338	Middlefield	226	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
339	Plainfield	224	2	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
340	Tyringham	211	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
341	Alford	207	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
342	Hawley	203	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–
343	Shutesbury	201	2	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–
344	Rowe	178	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
345	Monroe	171	2	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
346	Montgomery	137	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
347	Peru	116	–	–	–	–	–	–	–	–	–	–	10	–	1	–	–	–
348	Gay Head	114	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
349	Tolland	111	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
350	Gosnold	107	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–
351	New Ashford	99	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
352	Mt. Washington	53	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
353	Tewksbury State Hospital		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
354	Military Establishments		367	–	652	–	699	–	376	–	149	–	78	–	113	–	53	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities*

Line No.	Cities and Towns in Order of Population	Population estimated as of July 1, 1949	TUBERCULOSIS, PULMONARY															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
1	Massachusetts	4,660,546	3,075	1,501	2,739	1,697	2,679	1,612	2,675	1,557	2,858	1,592	2,608	1,495	2,656	1,279	2,451	1,064
2	Boston	766,386	884	505	859	560	788	513	733	521	902	500	804	516	916	440	841	398
3	Worcester	203,171	142	60	135	68	142	72	146	63	153	76	144	63	128	66	89	33
4	Springfield	168,955	96	42	90	51	88	27	60	35	90	42	78	45	74	29	68	34
5	Fall River	115,062	95	53	83	71	114	70	64	52	98	68	71	62	78	42	82	49
6	Cambridge	111,305	101	57	91	69	100	64	93	40	105	42	100	56	94	29	95	32
7	Lynn	111,305	89	33	54	35	61	43	51	37	52	32	58	41	45	26	54	23
8	New Bedford	110,308	107	53	114	46	113	46	86	51	81	45	81	44	73	26	71	25
9	Somerville	109,135	89	29	40	38	67	34	72	31	60	40	68	49	55	25	71	25
10	Lowell	101,229	87	29	96	43	71	38	93	44	69	38	74	40	52	29	61	24
11	Quincy	87,584	65	25	47	27	45	25	42	37	47	30	43	19	50	18	41	22
12	Lawrence	86,714	68	30	81	31	53	34	45	28	73	31	48	23	49	12	44	15
13	Newton	83,715	16	14	18	20	21	18	22	8	28	19	11	10	12	15	11	9
14	Medford	70,548	32	20	21	13	24	16	33	15	21	11	24	16	26	13	18	5
15	Brockton	67,706	24	17	24	24	23	17	32	23	21	15	41	15	34	15	23	11
16	Brookline	63,221	29	12	30	12	19	9	28	18	23	14	20	3	20	10	27	9
17	Malden	60,922	41	15	31	25	30	18	54	16	47	24	32	14	35	17	36	14
18	Pittsfield	56,931	21	8	21	15	13	9	15	12	27	16	21	11	29	15	19	6
19	Holyoke	53,775	44	19	32	20	31	29	23	15	23	26	23	18	31	11	30	12
20	Everett	50,088	16	13	34	17	29	13	25	18	23	12	20	7	22	8	29	3
21	Chicopee	47,219	28	14	21	7	20	11	16	15	15	6	26	10	29	18	11	12
22	Waltham	46,693	23	13	19	13	24	12	24	11	42	14	17	15	22	8	30	6
23	Arlington	46,541	24	9	15	15	21	15	19	11	22	13	23	11	27	8	21	4
24	Haverhill	46,162	41	15	22	22	30	14	28	13	28	19	27	9	26	9	27	9
25	Fitchburg	45,447	36	13	21	10	31	9	34	12	21	9	25	11	27	13	26	5
26	Salem	44,232	26	4	12	12	27	21	13	14	17	13	14	11	19	8	22	9
27	Chelsea	39,940	41	16	35	19	27	15	18	9	29	15	21	10	19	12	18	5
28	Taunton	39,661	14	19	13	15	16	16	26	18	18	11	17	16	18	13	18	13
29	Watertown	39,199	20	7	14	15	10	8	22	12	14	11	16	9	7	6	16	4
30	Revere	36,805	25	8	33	10	19	7	27	13	13	9	11	6	18	14	14	5
31	Weymouth	31,556	18	2	11	4	8	6	10	6	19	5	10	4	14	4	19	11
32	Belmont	30,627	11	8	14	3	11	7	11	3	15	6	4	2	8	5	5	2
33	Melrose	30,274	14	5	10	5	10	4	8	8	5	8	6	2	9	3	1	4
34	Beverly	27,925	12	5	10	6	12	7	6	2	1	4	4	4	1	4	7	-
35	Framingham	27,489	21	3	5	5	10	2	11	3	10	7	15	5	15	5	13	4
36	Gloucester	25,562	18	11	11	5	12	12	14	9	7	9	16	8	3	10	4	3
37	Northampton	25,129	11	4	15	9	11	12	19	10	18	8	16	9	24	9	25	5
38	Leominster	24,697	11	3	13	4	9	3	5	5	9	7	8	7	8	7	1	2
39	Milton	24,366	9	2	8	2	3	7	4	2	9	5	9	4	12	4	6	3

40	Methuen	24,271	15	5	6	7	13	2	7	7	8	2	8	8	14	3	14	1
41	Braintree	23,675	13	3	17	10	6	1	12	4	12	4	9	4	9	5	11	3
42	Peabody	22,797	19	7	12	9	14	8	14	7	9	9	14	6	3	8	8	5
43	Attleboro	22,621	11	8	15	8	7	6	17	13	15	8	9	9	13	2	12	7
44	North Adams	22,230	3	7	5	3	6	2	12	3	4	5	6	2	9	4	5	3
45	West Springfield	21,500	10	3	8	2	4	3	7	3	2	2	8	2	3	4	3	1
46	Westfield	20,963	7	6	8	7	11	5	12	11	11	8	6	2	10	10	5	4
47	Wakefield	20,845	4	5	6	6	10	8	7	4	2	3	3	2	3	3	1	–
48	Winthrop	20,422	7	2	14	3	11	1	15	5	12	5	7	3	6	2	11	1
49	Gardner	20,300	17	4	14	6	11	5	7	2	29	4	7	8	6	3	6	2
50	Woburn	19,976	9	5	2	2	10	6	4	3	5	6	10	5	11	9	2	1
51	Wellesley	19,720	3	1	3	1	3	1	4	3	2	3	3	2	5	1	3	1
52	Saugus	18,267	4	–	–	3	4	4	7	3	2	4	3	1	4	3	2	1
53	Southbridge	18,217	6	5	6	6	10	6	9	4	8	3	4	2	3	3	7	1
54	Greenfield	18,182	10	5	11	2	9	5	7	2	4	2	5	4	8	1	7	–
55	Dedham	17,644	6	5	5	3	3	3	4	2	9	3	11	7	5	7	4	2
56	Natick	17,505	8	–	4	1	5	4	10	2	5	2	5	4	6	–	3	5
57	Norwood	17,493	2	3	8	6	4	4	5	3	13	3	5	4	5	7	2	3
58	Needham	16,307	7	3	2	2	4	3	11	–	6	3	5	1	3	2	2	3
59	Milford	16,147	15	4	5	5	5	8	14	6	11	4	11	3	9	3	3	5
60	Marlborough	16,132	7	2	7	4	8	9	6	7	6	1	5	2	4	4	8	1
61	Lexington	15,536	20	1	15	2	11	4	11	2	9	2	2	–	1	1	1	1
62	Winchester	15,481	2	2	1	–	2	3	9	1	3	3	5	1	3	5	5	3
63	Danvers	15,025	5	1	6	1	3	2	5	3	4	4	6	2	5	3	9	2
64	Newburyport	14,223	3	–	4	2	5	5	9	4	7	4	8	2	5	3	3	2
65	Marblehead	13,964	6	2	6	1	7	2	2	2	2	1	11	1	2	1	6	2
66	Plymouth	13,943	8	3	5	4	6	4	7	5	5	3	2	5	5	2	4	2
67	Webster	13,826	4	4	1	5	4	4	12	9	6	3	3	3	6	3	6	5
68	Reading	13,637	3	3	2	3	2	2	1	1	7	2	4	2	3	–	–	1
69	Stoneham	13,116	2	3	6	4	3	1	4	2	3	1	3	2	4	2	4	–
70	Fairhaven	13,072	3	5	1	3	1	3	2	4	5	4	1	2	2	2	–	–
71	Clinton	12,991	2	–	1	2	7	3	3	5	8	3	3	3	6	–	6	–
72	Adams	12,821	6	7	5	5	4	4	6	3	4	6	4	4	9	7	1	1
73	Swampscott	12,781	9	–	5	1	1	2	2	1	–	2	5	3	1	1	2	1
74	Andover	12,620	5	3	6	2	4	3	1	3	3	1	7	–	6	2	2	4
75	North Attleboro	12,601	3	2	2	3	2	2	3	1	1	2	6	1	4	2	3	2
76	Athol	12,351	4	1	3	4	2	1	3	1	1	–	5	3	9	2	3	–
77	Hingham	11,132	3	1	3	3	3	–	2	1	5	2	5	3	3	3	2	1
78	Easthampton	10,830	4	2	2	–	2	2	5	1	9	1	5	3	1	2	4	1
79	Amesbury	10,824	2	1	–	1	4	1	5	1	5	4	2	–	–	2	2	–
80	Shrewsbury	10,791	–	1	3	2	–	1	1	1	2	–	8	–	3	6	–	3
81	Dartmouth	10,712	3	3	5	–	7	5	5	1	8	3	–	5	6	2	1	2
82	Northbridge	10,212	–	2	1	5	2	2	2	2	–	5	3	1	3	2	6	3
83	Palmer	10,211	5	2	5	3	1	4	1	2	3	1	4	6	6	1	5	1
84	Middleborough	10,099	2	2	3	2	4	4	2	1	3	1	4	1	–	–	1	2
85	Stoughton	9,470	8	3	9	1	5	3	5	1	1	6	4	3	2	1	2	1
86	Chelmsford	9,268	1	1	2	–	1	1	1	–	3	1	1	2	1	1	1	2
87	Walpole	9,258	2	–	–	1	3	1	1	2	–	1	3	–	1	1	3	2
88	Randolph	9,210	1	3	3	1	2	3	5	2	3	1	2	3	2	4	7	–
89	Rockland	9,053	–	2	1	2	3	5	1	–	–	1	1	2	4	4	1	1
90	Billerica	9,001	–	1	2	6	3	1	–	1	1	1	4	2	1	1	3	4
91	Auburn	8,958	3	2	3	1	4	2	–	1	3	1	4	1	1	1	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	TUBERCULOSIS, PULMONARY															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
92	Barnstable	8,943	3	–	2	2	5	3	4	1	6	1	7	–	5	3	1	–
93	Agawam	8,915	2	–	–	2	–	–	5	2	1	1	1	1	3	1	1	1
94	Concord	8,743	3	–	–	1	–	1	1	1	2	1	3	–	3	3	5	1
95	Whitman	8,740	2	1	4	5	4	5	2	2	5	2	3	–	–	2	3	1
96	Bridgewater	8,641	32	4	14	6	13	1	21	1	18	2	29	1	24	5	15	1
97	Falmouth	8,489	4	1	8	3	2	2	3	1	3	4	9	–	6	1	6	1
98	Grafton	8,425	9	1	9	1	–	3	13	1	7	2	10	1	6	–	10	1
99	Wareham	8,392	3	4	7	3	3	3	3	3	1	1	–	2	7	1	1	3
100	North Andover	8,286	6	3	1	2	2	2	3	5	–	1	2	2	1	–	4	1
101	Millbury	8,268	–	–	5	2	2	1	–	2	–	2	3	2	3	1	1	1
102	Hudson	8,171	–	–	1	3	1	1	–	1	1	3	–	3	–	–	1	–
103	Ludlow	8,065	3	4	2	3	5	1	–	1	2	3	3	4	1	2	1	–
104	South Hadley	7,809	4	4	3	3	1	–	1	1	3	1	3	–	5	2	5	–
105	Franklin	7,735	2	–	2	–	4	2	3	1	–	1	1	1	3	1	3	2
106	Amherst	7,696	–	2	1	–	1	1	1	1	1	2	1	1	1	2	2	1
107	Somerset	7,668	1	3	–	1	2	3	2	1	3	4	1	–	5	2	1	2
108	Montague	7,602	2	2	5	1	3	5	5	1	3	3	3	2	2	3	2	4
109	Ware	7,578	1	6	1	–	3	3	4	2	5	2	–	3	–	2	–	–
110	Dracut	7,524	12	4	1	3	4	–	3	1	1	6	4	3	–	2	3	2
111	Mansfield	7,380	–	1	1	1	5	2	5	1	5	2	2	2	5	1	1	1
112	Maynard	7,198	3	3	2	3	1	1	2	1	2	–	6	4	1	–	4	2
113	Canton	7,010	1	–	2	1	2	2	1	3	3	2	–	1	2	2	1	1
114	Abington	6,963	2	–	1	1	1	3	4	1	1	2	–	2	1	1	–	–
115	Longmeadow	6,957	–	–	2	1	–	1	2	1	3	1	1	–	3	1	3	–
116	Westborough	6,866	1	1	1	1	3	1	21	2	8	2	2	–	19	1	13	–
117	Ipswich	6,857	3	3	5	2	2	–	5	2	1	4	7	1	6	3	1	–
118	Spencer	6,856	4	1	2	3	–	1	–	1	–	–	2	1	4	–	–	–
119	Uxbridge	6,836	4	1	4	3	2	2	1	–	2	1	–	3	1	–	5	1
120	Foxborough	6,627	14	2	9	2	23	2	14	1	14	1	14	1	9	3	8	3
121	Great Barrington	6,581	2	–	4	4	3	2	2	1	1	1	1	–	1	–	4	–
122	Winchendon	6,461	5	1	3	1	2	1	2	1	3	2	–	1	1	2	5	2
123	Wilmington	6,377	1	2	–	–	1	–	1	–	–	2	3	1	–	–	1	2
124	Swansea	6,319	3	3	2	2	3	3	2	1	2	3	2	4	5	3	3	–
125	Easton	6,223	2	1	2	–	2	4	–	2	1	–	–	1	3	1	2	1
126	Westwood	6,053	1	–	–	1	1	–	–	1	–	1	–	–	1	–	–	–
127	Tewksbury	5,949	2	3	2	1	–	1	1	–	1	2	–	1	–	–	3	1
128	Orange	5,907	2	1	1	1	1	3	1	–	2	–	–	1	–	1	2	1
129	Monson	5,713	2	–	2	–	7	2	6	1	–	–	–	–	1	–	2	1
130	Holden	5,648	1	1	2	2	1	1	3	2	1	2	3	1	–	–	–	–

131	Seekonk	5,552	2	–	–	1	1	1	2	1	2	2	1	–	1	–	3	2
132	Scituate	5,526	1	2	3	2	2	–	–	1	–	2	5	2	2	2	1	–
133	Wrentham	5,437	15	1	4	1	19	2	19	1	24	3	14	–	3	–	7	1
134	Leicester	5,409	–	–	1	–	1	1	–	–	–	–	–	1	–	1	–	1
135	Oxford	5,368	–	–	–	1	2	–	1	1	2	1	4	–	1	1	–	–
136	Westport	5,297	1	–	1	–	–	–	1	–	3	1	1	–	–	–	2	1
137	Weston	5,241	1	1	1	–	–	–	2	–	–	1	2	–	–	–	–	–
138	Williamstown	4,919	–	1	1	–	–	–	–	2	–	–	1	–	2	1	3	–
139	Dudley	4,816	–	1	–	1	1	2	–	2	–	3	–	1	–	–	–	1
140	Dalton	4,517	–	1	–	1	–	–	–	4	3	–	–	1	–	–	–	–
141	Bedford	4,486	–	–	3	–	1	2	–	–	–	2	–	1	1	6	–	1
142	Lee	4,444	2	–	6	–	3	2	–	3	2	1	8	2	6	–	1	–
143	Hull	4,437	–	–	–	1	–	1	2	–	1	1	–	1	1	2	–	–
144	Templeton	4,435	–	–	1	–	–	1	1	2	1	–	2	1	3	–	–	–
145	Rockport	4,403	4	2	1	4	1	3	7	5	4	6	3	3	1	1	2	2
146	Sharon	4,379	–	3	1	–	–	6	1	2	2	1	–	1	–	2	1	–
147	Acushnet	4,370	1	–	1	–	–	–	2	3	1	–	–	–	1	–	1	1
148	Blackstone	4,349	–	–	1	1	–	–	–	1	–	–	–	1	1	1	–	–
149	Ayer	4,328	1	1	1	–	–	1	1	1	1	1	–	–	1	–	3	–
150	Wayland	4,262	–	1	–	–	2	1	–	–	2	–	1	–	–	–	–	1
151	Medfield	4,199	16	1	8	2	5	1	10	1	18	1	12	1	3	–	4	–
152	East Longmeadow	4,163	–	1	–	2	3	–	1	–	1	–	1	1	1	–	2	–
153	East Bridgewater	4,158	3	2	3	1	1	–	–	–	1	–	3	1	1	–	3	1
154	Holbrook	4,056	–	2	1	2	–	–	–	–	1	1	1	–	–	–	–	–
155	Belchertown	4,021	1	–	4	3	3	1	3	1	1	1	7	–	7	–	2	2
156	Cohasset	3,947	–	–	–	–	1	–	–	–	1	–	–	2	1	–	–	–
157	Bellingham	3,935	1	–	–	2	–	–	–	–	–	–	–	2	2	–	1	3
158	West Bridgewater	3,905	1	–	–	1	1	1	–	–	2	1	–	–	–	–	–	–
159	Westford	3,815	2	2	2	–	1	1	2	–	1	2	1	–	–	–	4	–
160	Bourne	3,716	1	1	3	1	1	1	4	–	6	2	2	–	2	–	2	–
161	Holliston	3,582	1	–	–	1	–	–	1	–	–	–	2	1	–	–	–	–
162	Provincetown	3,564	1	–	–	–	1	–	–	–	2	–	2	1	–	–	3	–
163	Hopedale	3,518	–	1	1	–	–	–	–	–	–	–	–	–	1	–	–	–
164	Charlton	3,507	–	1	–	–	–	2	–	1	2	–	1	–	–	1	–	–
165	Warren	3,498	–	–	–	–	2	–	–	1	1	–	–	1	1	–	1	1
166	Barre	3,485	–	–	2	1	2	–	–	–	–	1	2	1	1	1	–	1
167	Lynnfield	3,476	–	–	–	–	–	–	–	2	1	1	–	–	–	–	–	–
168	Northboro	3,450	–	1	–	–	–	–	–	–	–	1	2	1	1	–	–	–
169	Wilbraham	3,442	–	1	–	–	3	–	–	1	2	1	2	1	2	1	1	–
170	Deerfield	3,422	3	1	2	5	1	–	1	–	1	1	–	2	–	1	–	1
171	Medway	3,397	1	–	–	3	–	1	6	2	5	3	–	–	3	1	2	–
172	Ashland	3,326	1	–	–	1	–	–	–	1	–	1	–	3	–	1	–	1
173	Rehoboth	3,282	–	1	1	–	1	1	–	–	1	–	–	1	2	2	–	1
174	North Reading	3,270	–	1	1	1	–	–	1	1	1	2	–	1	3	2	1	–
175	Hanover	3,168	1	–	1	1	–	–	2	–	1	–	2	2	2	–	1	–
176	North Brookfield	3,121	–	–	–	–	–	2	–	–	2	3	3	1	1	–	1	–
177	Pepperell	3,119	5	1	–	2	–	–	1	–	2	–	2	–	1	1	1	1
178	Groton	3,106	2	–	–	–	–	1	–	1	–	–	–	–	1	1	–	–
179	Norton	3,096	1	–	–	1	3	–	–	1	1	–	1	1	3	–	1	2
180	Lancaster	3,092	–	2	2	–	2	–	–	–	–	–	–	–	–	–	4	–
181	Dighton	3,070	1	4	2	1	–	1	2	1	–	–	–	1	–	–	–	–
182	Lunenburg	3,058	–	1	–	1	2	1	1	–	–	–	1	1	–	–	1	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	CITIES AND TOWNS IN ORDER OF POPULATION	Population Estimated as of July 1, 1949	TUBERCULOSIS, PULMONARY															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
183	Kingston	3,018	–	1	1	1	4	1	1	1	–	–	–	–	–	1	1	1
184	Burlington	3,017	–	1	–	1	–	–	–	2	2	3	–	1	1	–	–	–
185	Acton	3,004	1	–	–	–	–	–	–	1	1	–	–	–	–	–	1	–
186	Lenox	3,000	–	–	1	–	2	1	3	–	–	–	–	–	–	2	–	–
187	Hopkinton	2,991	–	–	1	1	–	1	1	–	–	–	2	1	1	–	–	–
188	Nahant	2,890	–	–	1	1	–	–	1	–	–	2	1	1	–	–	1	1
189	West Boylston	2,874	–	–	1	–	5	–	–	–	–	–	–	1	3	1	–	–
190	Nantucket	2,870	1	–	1	1	3	–	1	–	2	–	4	–	1	2	1	1
191	Salisbury	2,828	–	–	–	–	–	1	2	–	–	–	2	–	2	–	1	2
192	Douglas	2,722	–	2	–	–	–	–	–	1	–	–	1	–	1	1	–	–
193	Avon	2,703	–	1	2	1	1	1	–	1	2	–	3	3	–	1	1	1
194	Hamilton	2,696	1	1	1	–	–	–	–	–	–	1	–	1	1	–	1	2
195	Hanson	2,695	–	2	1	–	–	2	2	1	2	1	2	1	3	1	4	1
196	Hadley	2,656	–	–	–	1	–	–	–	2	–	–	–	1	3	1	–	–
197	Sutton	2,610	2	–	–	–	1	–	–	–	–	–	2	–	1	–	–	1
198	Yarmouth	2,608	1	–	1	–	1	–	–	–	1	–	2	–	2	–	–	1
199	Manchester	2,580	–	–	–	–	–	–	–	–	1	1	–	–	1	–	3	–
200	Duxbury	2,486	1	1	–	–	–	–	1	–	–	1	2	–	–	2	–	–
201	Townsend	2,479	1	1	–	–	1	–	2	1	–	–	–	–	1	–	–	–
202	Upton	2,479	2	2	–	–	–	–	1	–	–	–	–	–	–	–	1	–
203	Shirley	2,459	–	–	–	1	–	–	–	1	1	–	1	–	1	–	–	1
204	Middleton	2,456	–	1	–	1	–	1	–	1	–	3	–	–	1	1	3	1
205	Merrimac	2,425	–	–	–	–	–	–	–	–	2	1	–	3	–	–	–	1
206	Southboro	2,421	1	1	1	1	–	–	–	1	–	1	–	–	–	–	–	–
207	Sturbridge	2,420	–	–	–	–	–	–	1	1	–	–	–	–	–	–	2	–
208	Marshfield	2,405	–	–	–	1	–	–	1	1	–	–	–	–	–	–	2	1
209	Norwell	2,393	2	–	1	–	1	–	–	2	–	–	–	–	1	–	–	–
210	Ashburnham	2,380	1	2	2	1	2	1	1	–	–	–	2	1	2	1	4	2
211	Millis	2,363	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
212	Mattapoisett	2,347	1	–	2	–	–	1	–	–	–	–	–	–	–	–	–	–
213	Sudbury	2,322	–	–	1	1	1	1	–	–	–	–	–	–	–	–	–	–
214	Plainville	2,278	1	–	2	–	1	–	–	–	–	–	3	1	1	–	–	1
215	Raynham	2,263	–	–	2	–	–	1	–	–	2	2	–	–	1	1	–	1
216	Chatham	2,241	2	–	1	1	–	–	2	–	–	–	–	–	–	1	2	–
217	Marion	2,216	–	–	2	1	1	1	–	–	2	–	–	–	–	1	2	2
218	Hatfield	2,188	2	1	3	2	1	1	–	1	4	2	1	–	1	–	1	2
219	Lincoln	2,179	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
220	Northfield	2,162	–	1	–	–	2	–	1	1	–	–	–	–	1	1	–	2
221	Westminster	2,153	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–

222	Groveland . . .	2,150	–	3	–	1	–	–	–	–	–	2	1	1	2	–	–	–
223	Southwick . . .	2,141	–	–	–	–	–	1	–	1	1	–	–	1	–	1	–	–
224	Georgetown . . .	2,122	–	–	–	–	–	–	–	–	–	–	1	–	3	–	–	–
225	Hardwick . . .	2,115	–	–	–	–	1	–	1	–	1	–	1	–	1	1	1	1
226	Harwich	2,071	4	1	2	–	–	–	2	2	–	3	–	2	–	1	1	–
227	Sterling	2,043	–	–	–	1	2	–	–	–	–	–	–	–	–	–	3	–
228	Freetown	2,027	1	–	2	–	–	1	–	–	1	–	–	1	1	1	1	–
229	Norfolk	2,006	9	1	4	–	4	–	2	–	4	1	1	–	–	–	2	–
230	Williamsburg . . .	1,980	–	–	–	–	–	–	1	–	1	2	1	3	1	–	–	–
231	Pembroke	1,917	–	1	–	1	1	–	–	–	–	–	–	1	–	–	–	–
232	Dennis	1,807	1	–	2	–	1	1	3	–	3	–	–	1	2	–	2	2
233	Sheffield	1,801	–	1	–	1	1	–	1	–	–	2	1	–	1	1	–	–
234	Lanesborough . . .	1,754	1	2	–	–	–	–	–	1	–	–	–	–	–	–	–	–
235	Stockbridge . . .	1,739	–	2	–	1	–	2	2	–	–	1	2	1	–	–	–	–
236	Dover	1,736	–	–	–	–	–	1	–	–	–	–	1	–	–	–	–	–
237	Tisbury	1,719	–	–	1	–	1	1	–	1	1	1	–	–	1	–	1	–
238	Cheshire	1,718	–	–	–	1	1	–	2	–	–	–	–	–	1	–	–	–
239	Essex	1,705	–	1	–	–	–	–	–	–	–	–	–	–	1	1	–	–
240	Newbury	1,677	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–
241	Littleton	1,673	–	–	1	1	–	–	1	1	–	–	–	1	–	1	–	1
242	Sandwich	1,671	1	–	–	–	2	1	1	–	1	–	–	–	–	–	–	–
243	Shelburne	1,656	–	–	–	–	–	1	2	–	–	–	–	–	–	–	–	–
244	Mendon	1,650	–	–	1	1	–	–	–	–	–	–	–	1	–	–	–	–
245	Orleans	1,642	1	1	–	–	1	–	–	–	1	–	–	1	–	–	–	–
246	Rowley	1,626	–	–	1	1	1	–	2	1	–	1	–	–	–	1	–	–
247	Millville	1,616	–	1	–	–	–	1	–	1	1	–	–	–	–	1	–	–
248	Rutland	1,561	–	11	–	10	6	8	1	15	2	11	2	13	3	18	4	9
249	Lakeville	1,555	1	1	–	2	1	–	1	–	1	–	–	1	–	–	–	1
250	Wenham	1,550	1	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
251	Buckland	1,525	–	–	2	–	–	–	–	–	–	–	–	–	–	–	1	–
252	West Brookfield . .	1,512	1	–	–	–	1	–	–	–	–	–	–	–	–	1	–	–
253	West Newbury . .	1,503	–	–	–	–	–	–	–	–	2	1	–	–	1	–	–	–
254	Tyngsborough . .	1,495	–	1	–	–	1	–	–	1	–	–	–	1	–	3	–	–
255	Colrain	1,455	1	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–
256	Clarksburg . . .	1,450	–	–	2	1	–	–	–	1	–	–	–	–	–	–	–	–
257	Stow	1,427	–	–	–	–	–	–	2	–	–	1	–	–	–	–	–	–
258	Brookfield . . .	1,390	2	–	–	–	1	–	–	–	–	–	2	–	–	–	–	–
259	Carver	1,383	1	–	–	–	1	2	–	–	–	1	–	–	–	2	–	–
260	Oak Bluffs . . .	1,345	–	–	3	1	–	–	–	–	–	1	–	–	2	2	2	2
261	Hinsdale	1,325	–	–	–	1	–	–	1	–	–	1	–	–	–	–	1	–
262	Erving	1,315	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–
263	Boylston	1,313	–	2	–	1	–	2	2	2	1	1	–	–	–	–	–	–
264	Edgartown . . .	1,296	1	1	–	–	–	–	–	–	–	1	1	–	–	–	–	–
265	Hampden	1,256	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–
266	Southampton . . .	1,254	–	–	–	–	–	–	–	1	–	1	–	–	1	–	–	–
267	Chester	1,252	–	–	–	–	–	–	–	–	1	–	–	1	–	–	–	–
268	Huntington . . .	1,242	1	1	–	1	1	–	–	–	1	–	–	–	1	–	–	2
269	Berkley	1,231	1	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–
270	Russell	1,221	–	–	–	–	–	–	–	–	1	–	1	–	–	–	1	–
271	Granby	1,193	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
272	Berlin	1,174	–	–	–	–	–	–	–	–	1	–	–	1	–	–	1	–
273	Ashby	1,155	1	1	–	–	–	–	–	–	–	–	–	–	1	–	3	3

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	TUBERCULOSIS, PULMONARY															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
274	Topsfield	1,153	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
275	East Brookfield	1,125	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–
276	Rochester	1,107	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
277	Halifax	1,093	1	–	–	–	–	2	–	–	–	–	1	–	1	–	–	–
278	Bernardston	1,070	1	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
279	Harvard	1,065	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
280	West Stockbridge	1,059	–	–	–	–	1	–	–	–	4	–	2	2	1	–	–	–
281	Sherborn	1,036	–	1	–	–	–	1	1	–	–	–	–	–	–	–	–	–
282	Hubbardston	1,019	–	–	–	–	–	–	–	1	–	–	–	1	1	–	–	–
283	Sunderland	1,018	1	–	1	–	–	1	–	1	–	–	–	1	–	–	–	–
284	Princeton	1,012	–	–	–	–	–	–	–	1	–	1	–	–	–	–	2	1
285	Ashfield	981	1	1	–	–	1	–	1	1	–	–	–	–	–	–	–	–
286	Brimfield	975	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
287	Whately	973	–	–	–	–	–	1	–	–	–	–	–	–	1	1	–	1
288	Gill	918	–	–	–	–	1	–	–	–	–	1	–	–	–	–	–	–
289	Bolton	905	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
290	Paxton	905	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
291	New Marlboro	896	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
292	Conway	867	–	–	–	–	1	–	–	1	–	1	–	–	–	–	–	–
293	Boxford	852	–	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–
294	Wellfleet	851	–	–	–	1	–	–	–	–	1	–	1	–	1	–	–	–
295	Charlemont	812	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
296	Brewster	757	2	–	–	–	–	1	–	–	1	1	–	–	1	–	–	–
297	Royalston	750	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–
298	Petersham	743	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
299	Carlisle	697	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
300	Becket	682	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
301	Egremont	660	–	–	1	–	–	–	–	–	–	–	1	–	–	–	–	–
302	Granville	656	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–
303	Richmond	646	1	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
304	Eastham	604	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
305	Leverett	594	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
306	Truro	582	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
307	Blandford	572	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
308	Plympton	545	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
309	Cummington	532	–	–	–	–	–	1	–	–	–	–	–	–	1	–	1	1
310	Pelham	512	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
311	Phillipston	475	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
312	Dunstable	440	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

313	Oakham	424	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
314	Westhampton	413	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
315	New Braintree	409	–	–	–	–	–	–	1	–	–	–	2	–	1	–	–	–	–	–	–	–	–
316	Florida	401	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
317	Warwick	401	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
318	Otis	377	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
319	Chesterfield	375	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
320	Sandisfield	370	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
321	New Salem	364	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–
322	Worthington	363	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
323	Boxborough	358	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
324	Wales	354	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
325	Hancock	349	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
326	Wendell	348	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
327	Mashpee	343	–	–	1	–	1	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–
328	Goshen	328	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
329	Heath	327	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
330	Monterey	305	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
331	Savoy	294	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
332	Windsor	274	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
333	Holland	265	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
334	Leyden	254	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
335	Washington	242	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
336	West Tisbury	239	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
337	Chilmark	230	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
338	Middlefield	226	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
339	Plainfield	224	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
340	Tyringham	211	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
341	Alford	207	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
342	Hawley	203	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
343	Shutesbury	201	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
344	Rowe	178	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
345	Monroe	171	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
346	Montgomery	137	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
347	Peru	116	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
348	Gay Head	114	–	–	1	–	1	1	1	–	–	–	–	1	–	–	–	–	–	–	–	–	–
349	Tolland	111	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
350	Gosnold	107	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
351	New Ashford	99	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
352	Mt. Washington	53	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
353	Tewksbury State Hospital		42	–	41	–	24	–	17	–	30	–	32	–	12	–	–	–	–	–	–	–	–
354	Military Establishments		10	–	–	–	–	–	44	–	15	–	–	–	–	–	–	–	–	–	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities*

Line No.	Cities and Towns in Order of Population	Population estimated as of July 1, 1949	WHOOPING COUGH															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
1	Massachusetts	4,660,546	10,932	27	5,990	38	4,051	15	7,445	22	6,514	16	7,121	15	2,778	11	4,638	7
2	Boston	766,386	2,190	6	1,309	3	799	5	1,568	1	1,123	3	1,196	2	549	5	1,249	2
3	Worcester	203,171	1,882	2	305	1	362	1	337	–	1,184	–	561	–	197	1	650	1
4	Springfield	168,955	428	3	95	1	257	–	105	–	333	–	260	–	47	–	161	–
5	Fall River	115,062	157	–	364	5	120	1	119	2	140	–	303	3	121	–	43	–
6	Cambridge	111,305	571	2	320	1	170	–	446	1	179	–	184	–	168	–	173	–
7	Lynn	111,305	543	3	225	4	94	–	424	–	67	–	281	–	105	–	91	–
8	New Bedford	110,308	36	–	62	1	145	–	86	–	112	–	139	2	82	–	35	–
9	Somerville	109,135	68	–	42	–	105	2	84	–	36	1	55	1	47	–	77	–
10	Lowell	101,229	38	1	10	–	32	3	82	2	67	1	84	–	18	–	9	–
11	Quincy	87,584	185	–	88	–	54	–	60	–	97	–	159	–	14	–	20	–
12	Lawrence	86,714	2	–	71	1	4	1	30	1	54	1	16	–	4	–	20	–
13	Newton	83,715	307	–	137	–	124	–	76	–	130	–	115	–	22	–	39	–
14	Medford	70,548	85	–	87	–	81	–	122	–	12	–	72	–	49	–	50	–
15	Brockton	67,706	129	–	90	–	8	–	212	–	58	–	245	1	42	–	28	–
16	Brookline	63,221	143	–	36	–	23	–	51	–	68	–	37	–	8	–	21	–
17	Malden	60,922	54	–	148	1	50	–	106	–	126	–	156	–	31	–	26	–
18	Pittsfield	56,931	59	–	55	–	21	–	160	–	49	–	37	–	25	–	96	2
19	Holyoke	53,775	25	–	51	1	6	–	22	1	26	–	20	–	4	–	98	–
20	Everett	50,088	38	–	22	–	8	–	41	–	32	–	30	–	8	–	25	–
21	Chicopee	47,219	48	–	19	–	20	–	34	–	42	–	26	–	1	–	63	–
22	Waltham	46,693	76	–	7	–	68	–	38	–	32	–	51	–	3	–	41	–
23	Arlington	46,541	112	–	47	–	75	–	74	1	79	–	75	–	18	–	12	–
24	Haverhill	46,162	92	1	69	1	10	–	98	1	96	–	6	–	150	1	49	–
25	Fitchburg	45,447	62	1	16	–	6	–	26	1	11	–	33	–	3	–	15	–
26	Salem	44,232	65	–	57	–	–	–	114	–	39	1	38	–	20	–	8	–
27	Chelsea	39,940	11	–	17	–	3	–	68	–	15	1	25	–	30	–	21	–
28	Taunton	39,661	3	–	1	–	–	–	1	–	14	1	6	–	5	–	1	–
29	Watertown	39,199	65	1	36	–	17	–	32	–	40	–	30	–	29	–	21	–
30	Revere	36,805	16	–	20	3	15	–	66	–	5	–	–	–	45	–	7	–
31	Weymouth	31,556	11	–	5	–	3	–	11	–	2	–	31	–	15	–	4	–
32	Belmont	30,627	87	–	13	–	23	–	144	–	59	–	45	–	11	–	34	–
33	Melrose	30,274	9	–	37	1	7	–	31	1	29	–	46	–	16	–	29	–
34	Beverly	27,925	27	–	4	–	–	–	37	–	43	–	1	–	3	–	8	–
35	Framingham	27,489	72	–	99	–	76	–	6	–	104	–	17	–	14	1	63	–
36	Gloucester	25,562	1	–	28	–	–	–	6	–	12	–	7	–	4	–	6	–
37	Northampton	25,129	91	1	88	1	82	–	44	–	17	–	71	–	1	–	24	–
38	Leominster	24,697	2	–	4	–	1	–	2	–	45	–	6	–	–	–	6	–
39	Milton	24,366	21	–	73	–	21	–	13	–	27	–	7	–	6	–	32	–

40	Methuen	24,271	20	–	24	–	–	–	11	–	6	–	17	–	2	–	13	–	–	–	–	–	–
41	Braintree	23,675	21	–	29	–	34	–	37	–	39	–	82	–	19	–	13	–	–	–	–	–	–
42	Peabody	22,797	29	–	31	–	5	–	43	–	2	–	8	–	3	–	3	–	–	–	–	–	–
43	Attleboro	22,621	73	–	106	–	49	–	66	–	129	–	126	–	8	–	18	–	–	–	–	–	–
44	North Adams	22,230	2	–	5	–	–	–	25	–	6	–	61	–	5	–	6	–	–	–	–	–	–
45	West Springfield	21,500	82	–	6	–	21	–	27	–	72	–	123	–	11	–	32	–	–	–	–	–	–
46	Westfield	20,963	45	–	10	–	2	–	19	–	–	–	–	–	1	–	30	–	–	–	–	–	–
47	Wakefield	20,845	10	–	16	–	4	–	6	–	12	–	16	–	8	–	7	–	–	–	–	–	–
48	Winthrop	20,422	50	–	56	–	10	–	141	–	26	–	91	–	14	–	18	–	–	–	–	–	–
49	Gardner	20,300	31	–	11	–	1	–	26	–	1	–	8	–	21	–	15	–	–	–	–	–	–
50	Woburn	19,976	22	–	8	–	5	–	16	–	1	–	6	–	7	–	21	–	–	–	–	–	–
51	Wellesley	19,720	188	–	38	–	29	–	45	–	34	–	31	–	19	–	7	–	–	–	–	–	–
52	Saugus	18,267	34	–	16	1	7	–	35	–	9	–	43	1	21	–	10	–	–	–	–	–	–
53	Southbridge	18,217	–	–	10	–	–	–	47	1	8	1	5	–	–	–	1	–	–	–	–	–	–
54	Greenfield	18,182	29	–	61	–	7	–	46	–	29	–	9	–	5	–	20	–	–	–	–	–	–
55	Dedham	17,644	18	–	13	–	16	–	16	–	16	–	24	–	1	–	1	–	–	–	–	–	–
56	Natick	17,505	148	–	85	–	77	–	24	–	49	–	196	–	8	–	49	–	–	–	–	–	–
57	Norwood	17,493	1	–	2	–	1	–	8	–	6	–	4	–	3	–	–	–	–	–	–	–	–
58	Needham	16,307	184	–	14	–	34	–	32	–	48	–	95	–	7	–	13	–	–	–	–	–	–
59	Milford	16,147	1	–	23	–	15	–	56	–	5	–	20	–	60	–	37	–	–	–	–	–	–
60	Marlborough	16,132	2	–	–	1	3	–	7	–	11	–	1	–	2	–	4	–	–	–	–	–	–
61	Lexington	15,536	20	–	4	–	28	–	48	–	22	–	12	–	4	–	15	–	–	–	–	–	–
62	Winchester	15,481	25	–	27	–	36	–	20	–	1	–	35	–	11	–	7	–	–	–	–	–	–
63	Danvers	15,025	5	–	2	–	–	–	19	–	1	–	4	–	–	–	1	–	–	–	–	–	–
64	Newburyport	14,223	71	1	55	–	6	–	77	1	29	–	1	–	1	–	6	–	–	–	–	–	–
65	Marblehead	13,964	41	–	50	–	5	–	13	–	3	1	85	–	6	–	2	–	–	–	–	–	–
66	Plymouth	18,943	31	–	9	–	10	–	14	–	3	–	9	–	9	1	–	–	–	–	–	–	–
67	Webster	13,826	20	–	–	–	1	–	1	–	12	–	–	–	6	–	4	–	–	–	–	–	–
68	Reading	13,637	31	–	7	–	13	–	5	–	4	–	20	–	–	–	14	–	–	–	–	–	–
69	Stoneham	13,116	21	–	12	–	3	–	31	–	9	–	37	–	16	–	14	–	–	–	–	–	–
70	Fairhaven	13,072	–	–	2	–	–	–	–	–	1	1	–	1	–	–	–	–	–	–	–	–	–
71	Clinton	12,991	11	–	3	1	3	–	–	–	1	–	21	–	–	–	3	–	–	–	–	–	–
72	Adams	12,821	–	–	40	1	–	–	–	–	–	–	20	–	–	–	28	–	–	–	–	–	–
73	Swampscott	12,781	51	–	29	–	4	–	67	–	1	–	22	–	16	1	26	–	–	–	–	–	–
74	Andover	12,620	17	–	37	–	21	–	24	–	12	–	16	–	31	–	5	–	–	–	–	–	–
75	North Attleboro	12,601	–	–	–	–	4	–	27	–	5	–	23	–	1	–	2	–	–	–	–	–	–
76	Athol	12,351	4	–	3	–	–	–	12	–	1	–	–	–	–	–	53	–	–	–	–	–	–
77	Hingham	11,132	16	–	9	–	27	–	8	–	8	–	12	–	35	–	3	–	–	–	–	–	–
78	Easthampton	10,830	5	–	–	–	1	–	2	–	7	–	5	1	–	–	5	–	–	–	–	–	–
79	Amesbury	10,824	68	–	12	–	5	–	14	–	46	–	–	–	32	–	33	–	–	–	–	–	–
80	Shrewsbury	10,791	12	1	13	–	12	–	6	–	20	–	17	–	2	–	8	–	–	–	–	–	–
81	Dartmouth	10,712	10	–	2	–	32	–	25	–	17	–	58	–	16	–	5	–	–	–	–	–	–
82	Northbridge	10,212	–	–	1	–	4	–	1	–	–	–	2	–	7	–	5	–	–	–	–	–	–
83	Palmer	10,211	33	–	–	–	–	–	15	–	33	1	7	–	1	–	–	–	–	–	–	–	–
84	Middleborough	10,099	13	–	2	–	12	–	3	–	–	–	2	–	–	–	–	–	–	–	–	–	–
85	Stoughton	9,470	6	–	2	–	1	–	17	–	2	–	12	–	1	–	–	–	–	–	–	–	–
86	Chelmsford	9,268	5	–	–	–	–	–	2	–	16	–	–	–	1	–	–	–	–	–	–	–	–
87	Walpole	9,258	16	–	6	1	28	–	23	–	13	–	7	–	5	–	7	–	–	–	–	–	–
88	Randolph	9,210	–	–	1	–	–	–	1	–	–	–	–	–	11	–	–	–	–	–	–	–	–
89	Rockland	9,053	–	–	1	–	1	–	11	–	6	–	4	–	1	–	–	–	–	–	–	–	–
90	Billerica	9,001	6	–	8	–	2	–	24	–	1	–	1	–	11	–	1	–	–	–	–	–	–
91	Auburn	8,958	83	–	49	–	4	–	5	–	91	–	4	–	–	–	72	–	–	–	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population estimated as of July 1, 1949	WHOOPING COUGH															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
92	Barnstable	8,943	4	–	14	–	–	–	9	–	37	–	28	–	–	–	8	–
93	Agawam	8,915	9	–	5	–	7	–	10	–	37	–	37	–	5	–	6	–
94	Concord	8,743	3	–	6	–	3	–	17	–	1	–	15	–	3	–	–	–
95	Whitman	8,740	1	–	4	–	6	–	13	–	2	–	3	–	–	–	–	–
96	Bridgewater	8,641	–	–	6	–	8	–	53	–	–	–	34	–	8	–	–	–
97	Falmouth	8,489	24	–	1	–	2	–	14	–	–	–	6	–	2	–	–	–
98	Grafton	8,425	4	–	2	–	–	–	4	–	–	–	5	–	14	–	2	–
99	Wareham	8,392	–	–	3	–	–	–	4	1	–	–	3	–	2	–	–	–
100	North Andover	8,286	9	–	29	–	–	–	10	–	5	–	6	–	–	–	1	–
101	Millbury	8,268	66	–	6	–	94	–	28	–	32	–	39	–	35	–	4	–
102	Hudson	8,171	–	–	–	–	–	–	–	–	1	–	2	–	–	–	–	–
103	Ludlow	8,065	15	–	4	–	3	–	42	–	35	–	7	–	6	–	–	–
104	South Hadley	7,809	2	–	3	–	3	–	–	1	7	–	–	–	–	–	–	–
105	Franklin	7,735	1	–	3	–	32	1	2	–	–	–	1	–	–	–	5	–
106	Amherst	7,696	3	–	9	–	7	–	11	–	2	–	2	–	–	–	10	–
107	Somerset	7,668	3	–	6	–	2	–	1	–	–	–	–	1	–	–	–	–
108	Montague	7,602	1	–	5	–	–	–	8	–	–	–	3	–	24	–	–	–
109	Ware	7,578	16	–	1	–	5	–	16	–	3	–	–	–	–	–	1	–
110	Dracut	7,524	–	–	–	–	–	–	8	–	14	–	1	–	–	–	–	–
111	Mansfield	7,380	83	–	24	1	–	–	–	–	33	–	27	–	4	–	1	–
112	Maynard	7,198	3	1	–	–	2	–	3	–	2	–	20	–	2	1	–	–
113	Canton	7,010	4	–	6	–	2	–	–	–	6	–	46	–	1	–	–	–
114	Abington	6,963	2	–	5	–	1	–	8	–	8	–	20	–	2	–	3	–
115	Longmeadow	6,957	2	–	–	–	14	–	2	–	7	–	5	–	6	–	10	–
116	Westborough	6,866	1	–	3	–	–	–	42	–	13	–	5	–	2	–	–	–
117	Ipswich	6,857	4	–	11	–	3	–	41	–	2	–	7	–	4	–	2	–
118	Spencer	6,856	103	–	3	–	–	–	16	–	19	–	2	–	10	–	63	–
119	Uxbridge	6,836	48	–	4	–	13	–	1	–	8	–	–	–	6	–	9	–
120	Foxborough	6,627	26	–	9	–	6	–	17	–	5	–	31	–	12	–	4	–
121	Great Barrington	6,581	74	–	2	–	1	–	18	–	39	–	17	–	–	–	3	–
122	Winchendon	6,461	34	–	2	–	4	–	1	–	16	–	47	–	–	–	37	–
123	Wilmington	6,377	4	–	–	–	–	–	14	–	2	–	6	–	3	–	5	–
124	Swansea	6,319	2	–	8	–	5	–	–	–	–	–	12	–	2	–	4	–
125	Easton	6,223	1	–	7	–	2	–	15	–	22	–	4	–	2	–	27	–
126	Westwood	6,053	–	–	3	–	1	–	6	–	11	–	–	–	–	–	–	–
127	Tewksbury	5,949	30	–	–	–	–	–	7	–	2	–	4	–	–	–	4	–
128	Orange	5,907	4	–	–	–	14	–	9	1	5	–	–	–	–	–	14	1
129	Monson	5,713	12	–	2	–	–	–	28	–	–	–	5	–	–	–	1	–
130	Holden	5,648	36	1	13	–	41	–	22	–	32	–	2	–	9	–	3	–

131	Seekonk	5,552	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
132	Scituate	5,526	–	–	12	–	3	–	3	–	1	–	3	–	1	–	1	–
133	Wrentham	5,437	–	–	1	–	–	–	62	–	1	–	13	–	–	–	–	–
134	Leicester	5,409	2	–	–	–	–	–	–	–	–	–	3	–	1	–	–	–
135	Oxford	5,368	31	–	11	–	15	–	8	–	9	–	28	–	5	–	–	–
136	Westport	5,297	1	–	6	–	3	–	2	–	1	–	21	–	5	–	5	–
137	Weston	5,241	38	–	1	–	6	–	–	–	6	–	11	–	–	–	10	–
138	Williamstown	4,919	3	–	5	–	21	–	12	–	12	–	4	–	–	–	–	–
139	Dudley	4,816	–	–	–	–	–	–	–	–	1	–	2	–	–	–	2	–
140	Dalton	4,517	–	–	4	1	–	–	–	–	8	–	9	–	–	–	1	–
141	Bedford	4,486	3	–	9	–	45	–	3	–	1	–	–	–	–	–	–	–
142	Lee	4,444	17	–	25	–	3	–	5	–	20	–	7	–	17	–	4	–
143	Hull	4,437	11	–	–	–	–	–	–	–	5	–	–	–	3	–	1	–
144	Templeton	4,435	–	–	–	–	–	–	8	–	–	–	3	–	1	–	7	1
145	Rockport	4,403	–	–	1	1	–	–	–	–	16	–	–	–	–	–	–	–
146	Sharon	4,379	2	–	7	–	–	–	–	–	–	–	13	–	2	–	7	–
147	Acushnet	4,370	–	–	2	–	–	1	–	–	1	–	–	–	–	–	–	–
148	Blackstone	4,349	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
149	Ayer	4,328	9	–	22	–	–	–	3	–	4	–	1	–	3	–	1	–
150	Wayland	4,262	–	–	–	–	3	–	–	–	3	–	4	–	–	–	–	–
151	Medfield	4,199	–	–	14	–	2	–	4	–	2	–	3	–	–	–	–	–
152	East Longmeadow	4,163	6	–	–	–	–	–	–	–	–	–	44	–	–	–	3	–
153	East Bridgewater	4,158	42	–	26	–	–	–	17	1	9	–	45	–	4	–	7	–
154	Holbrook	4,056	6	–	22	–	–	–	1	–	4	–	3	–	–	–	–	–
155	Belchertown	4,021	61	–	–	–	–	–	2	1	10	–	–	–	1	–	16	–
156	Cohasset	3,947	–	–	4	–	–	–	–	–	–	–	–	–	3	–	1	–
157	Bellingham	3,935	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
158	West Bridgewater	3,905	2	–	39	–	3	–	2	–	4	–	6	–	–	–	2	–
159	Westford	3,815	23	–	10	–	–	–	9	–	11	–	22	–	13	–	4	–
160	Bourne	3,716	5	–	2	–	1	–	12	–	15	–	3	–	–	–	–	–
161	Holliston	3,582	6	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
162	Provincetown	3,564	8	–	2	–	–	–	22	–	–	–	–	–	–	–	–	–
163	Hopedale	3,518	1	–	1	–	4	–	6	–	5	–	–	–	–	–	–	–
164	Charlton	3,507	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
165	Warren	3,498	5	–	18	–	2	–	5	–	15	–	3	–	–	–	–	–
166	Barre	3,485	12	–	50	–	13	–	2	–	16	–	8	–	–	–	1	–
167	Lynnfield	3,476	2	–	13	–	1	–	14	–	2	–	3	–	2	–	3	–
168	Northboro	3,450	–	–	–	–	–	–	–	–	1	1	1	–	–	–	7	–
169	Wilbraham	3,442	16	1	–	–	–	–	10	–	13	–	3	–	–	–	–	–
170	Deerfield	3,422	2	–	3	–	–	–	–	–	–	–	1	–	–	–	–	–
171	Medway	3,397	–	–	1	–	2	–	–	–	–	–	4	–	14	–	6	–
172	Ashland	3,326	8	–	7	–	5	–	–	–	15	–	–	–	–	–	–	–
173	Rehoboth	3,282	–	–	–	–	–	–	–	–	3	–	–	–	–	–	1	–
174	North Reading	3,270	–	–	16	–	–	–	–	1	10	–	1	–	–	–	37	–
175	Hanover	3,168	2	–	2	–	–	–	16	–	1	–	15	–	–	–	–	–
176	North Brookfield	3,121	4	–	12	–	–	–	1	–	1	–	1	–	–	–	17	–
177	Pepperell	3,119	–	–	–	–	–	–	1	–	–	–	7	–	–	–	2	–
178	Groton	3,106	12	–	10	–	–	–	1	–	–	–	1	–	1	–	1	–
179	Norton	3,096	–	–	23	–	–	–	–	–	–	–	–	–	–	–	–	–
180	Lancaster	3,092	15	–	5	–	15	–	16	1	15	–	4	–	–	–	5	–
181	Dighton	3,070	8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
182	Lunenburg	3,058	1	–	–	–	3	–	–	–	–	–	5	–	–	–	–	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	WHOOPING COUGH															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
183	Kingston	3,018	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
184	Burlington	3,017	4	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–
185	Acton	3,004	–	–	–	–	5	–	3	–	4	–	13	–	17	–	–	–
186	Lenox	3,000	–	–	–	–	4	–	13	–	–	1	–	–	11	–	–	–
187	Hopkinton	2,991	5	–	–	–	6	–	5	–	–	–	40	–	–	–	12	–
188	Nahant	2,890	13	–	3	–	–	–	1	–	–	–	3	–	6	–	2	–
189	West Boylston	2,874	32	–	2	–	4	–	5	–	10	–	1	–	1	–	24	–
190	Nantucket	2,870	4	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–
191	Salisbury	2,828	2	–	6	–	–	–	8	–	20	–	–	–	2	–	2	–
192	Douglas	2,722	4	–	3	–	–	–	–	–	–	–	38	–	4	–	–	–
193	Avon	2,703	–	–	10	–	1	–	3	–	–	–	22	–	3	–	–	–
194	Hamilton	2,696	1	–	1	–	2	–	8	–	6	–	15	1	–	–	1	–
195	Hanson	2,695	–	–	–	–	–	–	60	–	2	–	4	–	3	–	–	–
196	Hadley	2,656	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
197	Sutton	2,610	2	–	1	–	12	–	2	–	10	–	6	–	–	–	2	–
198	Yarmouth	2,608	–	–	–	–	–	–	–	–	4	–	1	–	–	–	3	–
199	Manchester	2,580	1	–	–	–	–	–	7	–	4	–	–	–	4	–	–	–
200	Duxbury	2,486	8	–	–	–	–	–	1	–	8	–	8	–	–	–	–	–
201	Townsend	2,479	16	–	4	–	2	–	2	–	2	–	11	–	–	–	3	–
202	Upton	2,479	11	–	2	–	–	–	18	–	3	–	1	–	1	–	1	–
203	Shirley	2,459	17	–	–	–	–	–	–	–	–	–	–	–	8	–	–	–
204	Middleton	2,456	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
205	Merrimac	2,425	2	–	10	–	–	–	6	–	13	–	12	–	1	–	6	–
206	Southboro	2,421	2	–	6	–	–	–	2	–	23	–	–	–	3	–	13	–
207	Sturbridge	2,420	12	–	1	–	–	–	5	–	1	–	15	–	–	–	14	–
208	Marshfield	2,405	8	–	–	–	–	–	3	–	–	–	1	–	–	–	–	–
209	Norwell	2,393	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
210	Ashburnham	2,380	7	–	12	–	–	–	–	–	–	–	4	–	–	–	36	–
211	Millis	2,363	–	–	–	–	–	–	1	–	–	–	1	–	1	–	–	–
212	Mattapoisett	2,347	–	–	–	–	36	–	4	–	55	–	8	–	5	–	–	–
213	Sudbury	2,322	1	–	1	–	1	–	1	–	–	–	4	–	–	–	–	–
214	Plainville	2,278	–	–	–	–	1	–	5	–	–	–	2	–	–	–	1	–
215	Raynham	2,263	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
216	Chatham	2,241	–	–	–	–	–	–	–	–	2	–	2	–	16	–	–	–
217	Marion	2,216	–	–	–	–	1	–	5	–	1	–	2	–	2	–	–	–
218	Hatfield	2,188	9	–	2	–	–	–	13	–	1	–	2	–	–	–	1	–
219	Lincoln	2,179	–	–	17	–	–	–	–	–	–	–	–	–	–	–	–	–
220	Northfield	2,162	1	–	1	–	–	–	5	–	3	–	9	–	–	–	–	–
221	Westminster	2,153	–	–	–	–	–	–	26	–	–	–	–	–	1	–	1	–

222	Groveland	2,150	9	–	1	–	1	–	9	–	1	–	1	–	–	–	–	–
223	Southwick	2,141	–	–	–	–	–	–	–	–	–	–	7	–	2	–	6	–
224	Georgetown	2,122	–	–	1	–	–	–	–	–	–	–	1	–	–	–	9	–
225	Hardwick	2,115	1	–	10	–	–	–	5	–	–	–	34	1	–	–	–	–
226	Harwich	2,071	–	–	–	–	–	–	–	–	–	–	25	–	–	–	–	–
227	Sterling	2,043	2	–	1	–	–	–	17	–	21	–	2	–	–	–	17	–
228	Freetown	2,027	–	–	–	–	1	–	–	–	–	–	1	–	–	–	4	–
229	Norfolk	2,006	–	–	–	–	5	–	–	–	–	–	–	–	–	–	–	–
230	Williamsburg	1,980	1	–	23	–	6	–	4	–	–	–	38	–	–	–	–	–
231	Pembroke	1,917	–	–	–	–	–	–	34	–	7	–	–	–	–	–	1	–
232	Dennis	1,807	1	–	9	–	–	–	8	–	1	–	–	–	–	–	–	–
233	Sheffield	1,801	28	–	28	–	–	–	–	–	26	–	–	–	–	–	–	–
234	Lanesborough	1,754	–	–	–	–	–	–	6	–	–	–	–	–	–	–	2	–
235	Stockbridge	1,739	1	–	4	–	–	–	1	–	–	–	1	–	–	–	–	–
236	Dover	1,736	1	–	2	–	2	–	–	–	5	–	2	–	–	–	2	–
237	Tisbury	1,719	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
238	Cheshire	1,718	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
239	Essex	1,705	7	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
240	Newbury	1,677	–	–	–	–	–	–	15	–	–	–	–	–	–	–	–	–
241	Littleton	1,673	5	–	1	–	1	–	28	–	–	–	–	–	–	–	–	–
242	Sandwich	1,671	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
243	Shelburne	1,656	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–
244	Mendon	1,650	–	–	–	–	–	–	4	–	–	–	–	–	–	–	–	–
245	Orleans	1,642	54	–	1	–	–	–	–	–	–	–	23	–	–	–	–	–
246	Rowley	1,626	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
247	Millville	1,616	2	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
248	Rutland	1,561	3	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
249	Lakeville	1,555	4	–	1	–	–	–	4	–	–	–	–	–	–	–	–	–
250	Wenham	1,550	1	–	3	–	–	–	19	–	1	–	1	–	–	–	–	–
251	Buckland	1,525	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
252	West Brookfield	1,512	15	–	8	–	13	–	4	–	16	–	–	–	–	–	–	–
253	West Newbury	1,503	–	–	–	–	–	–	2	–	8	–	–	–	–	–	–	–
254	Tyngsborough	1,495	5	–	–	–	–	–	18	–	1	–	5	–	–	–	–	–
255	Colrain	1,455	–	–	9	–	–	–	2	–	11	–	–	–	–	–	–	–
256	Clarksburg	1,450	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
257	Stow	1,427	3	–	10	–	–	–	4	–	–	–	3	–	2	–	–	–
258	Brookfield	1,390	5	–	1	–	1	–	–	–	–	–	27	–	–	–	4	–
259	Carver	1,383	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
260	Oak Bluffs	1,345	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
261	Hinsdale	1,325	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
262	Erving	1,315	5	–	–	–	2	–	–	–	–	–	–	–	–	–	2	–
263	Boylston	1,313	–	–	8	–	–	–	5	–	29	–	–	–	–	–	–	–
264	Edgartown	1,296	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
265	Hampden	1,256	–	–	–	–	–	–	–	–	1	–	10	–	–	–	8	–
266	Southampton	1,254	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
267	Chester	1,252	42	–	–	–	–	–	3	–	1	–	–	–	–	–	1	–
268	Huntington	1,242	11	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
269	Berkley	1,231	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
270	Russell	1,221	16	–	–	–	–	–	–	–	–	–	–	–	–	–	30	–
271	Granby	1,193	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
272	Berlin	1,174	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
273	Ashby	1,155	1	–	8	–	–	–	–	–	–	–	–	–	3	–	5	–

TABLE XIX — *Cases and Deaths from Diseases Dangerous to the Public Health by Communities* — Continued

Line No.	Cities and Towns in Order of Population	Population Estimated as of July 1, 1949	WHOOPING COUGH															
			1942		1943		1944		1945		1946		1947		1948		1949	
			C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
274	Topsfield	1,153	–	–	2	–	–	–	2	–	–	–	1	–	33	–	2	–
275	East Brookfield	1,125	13	–	–	–	–	–	–	–	–	–	–	–	–	–	8	–
276	Rochester	1,107	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
277	Halifax	1,093	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
278	Bernardston	1,070	10	–	7	–	–	–	–	–	–	–	1	–	–	–	–	–
279	Harvard	1,065	4	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
280	West Stockbridge	1,059	–	–	3	–	–	–	7	–	3	–	8	–	14	–	–	–
281	Sherborn	1,036	2	–	1	–	2	–	–	–	–	–	–	–	–	–	–	–
282	Hubbardston	1,019	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
283	Sunderland	1,018	1	–	–	–	–	–	6	–	–	–	–	–	–	–	–	–
284	Princeton	1,012	24	–	–	–	–	–	–	–	–	–	16	–	–	–	–	–
285	Ashfield	981	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
286	Brimfield	975	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
287	Whately	973	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
288	Gill	918	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
289	Bolton	905	–	–	–	–	–	–	–	–	–	–	7	–	–	–	2	–
290	Paxton	905	–	–	1	–	–	–	–	–	–	–	–	–	–	–	8	–
291	New Marlboro	896	7	–	21	–	–	–	2	–	1	–	–	–	–	–	17	–
292	Conway	867	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
293	Boxford	852	3	–	–	–	–	–	–	–	–	–	2	–	–	–	1	–
294	Wellfleet	851	–	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–
295	Charlemont	812	–	–	–	–	–	–	–	–	–	–	4	–	–	–	–	–
296	Brewster	757	–	–	–	–	1	–	–	–	2	–	–	–	–	–	–	–
297	Royalston	750	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
298	Petersham	743	–	–	–	–	–	–	–	–	6	–	–	–	–	–	–	–
299	Carlisle	697	–	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–
300	Becket	682	–	–	4	3	–	–	–	–	–	–	1	–	–	–	–	–
301	Egremont	660	2	–	–	–	–	–	–	–	5	–	–	–	4	–	–	–
302	Granville	656	29	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
303	Richmond	646	4	–	–	–	–	–	26	–	1	–	–	–	7	–	6	–
304	Eastham	604	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
305	Leverett	594	–	–	–	–	–	–	–	–	–	–	6	–	–	–	–	–
306	Truro	582	8	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
307	Blandford	572	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
308	Plympton	545	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
309	Cummington	532	4	–	7	–	–	–	–	–	–	–	–	–	–	–	4	–
310	Pelham	512	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
311	Phillipston	475	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
312	Dunstable	440	1	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–

313	Oakham	424	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
314	Westhampton	413	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
315	New Braintree	409	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
316	Florida	401	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
317	Warwick	401	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
318	Otis	377	-	-	25	-	-	-	3	-	-	-	2	-	18	-	-	-
319	Chesterfield	375	-	-	-	-	26	-	11	-	4	-	-	-	-	-	4	-
320	Sandisfield	370	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
321	New Salem	364	-	-	-	-	-	-	3	1	-	-	-	-	-	-	1	-
322	Worthington	363	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
323	Boxborough	358	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
324	Wales	354	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-
325	Hancock	349	-	-	-	-	-	-	-	-	15	-	-	-	-	-	-	-
326	Wendell	348	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
327	Mashpee	343	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
328	Goshen	328	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
329	Heath	327	-	-	-	-	2	-	-	-	34	-	2	-	-	-	-	-
330	Monterey	305	-	-	1	-	-	-	-	-	-	-	12	-	-	-	-	-
331	Savoy	294	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
332	Windsor	274	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
333	Holland	265	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
334	Leyden	254	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
335	Washington	242	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
336	West Tisbury	239	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
337	Chilmark	230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
338	Middlefield	226	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
339	Plainfield	224	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
340	Tyringham	211	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
341	Alford	207	-	-	-	-	-	-	3	-	8	-	-	-	-	-	-	-
342	Hawley	203	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
343	Shutesbury	201	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
344	Rowe	178	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
345	Monroe	171	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
346	Montgomery	137	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-
347	Peru	116	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
348	Gay Head	114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
349	Tolland	111	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
350	Gosnold	107	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
351	New Ashford	99	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
352	Mt. Washington	53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
353	Tewksbury State Hospital		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
354	Military Establishments		4	-	-	-	3	-	-	-	1	-	-	-	-	-	-	-

Actinomycosis

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Avon	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–
Boston	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–
Brockton	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Burlington	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Everett	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Fall River	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–
Falmouth	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Holyoke	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Lakeville	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
Lawrence	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Medford	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Military Est.	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
New Bedford	–	–	–	–	–	1	–	–	–	–	–	–	–	–	1	–
Norfolk	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Palmer	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Somerset	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Springfield	1	1	1	1	–	–	–	–	–	–	1	–	–	–	–	–
Waltham	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
West Springfield	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–
Total	1	1	2	2	5	3	2	3	3	2	1	–	2	–	1	–

Anthrax

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Boston	1	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–
Chelsea	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–
Franklin	–	–	–	–	1	1	2	1	–	–	1	–	–	–	–	–
Haverhill	2	1	3	–	–	–	–	–	–	–	–	–	–	–	–	–
Lowell	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Lynn	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Middleboro	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Milton	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Newton	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Peabody	–	–	–	–	1	–	1	–	1	–	–	–	–	–	1	–
Salem	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Saugus	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–
Somerville	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–
Woburn	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	5	1	5	–	4	1	4	1	2	1	2	–	3	1	3	–

Dysentery, Amebic

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Boston	–	–	1	–	–	–	1	–	–	–	4	–	1	–	–	–
Brookline	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Cambridge	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–
Danvers	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Fall River	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Fitchburg	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Gt. Barrington	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Lawrence	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Marblehead	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Melrose	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Military Est.	–	–	–	–	2	–	17	–	4	–	–	–	–	–	–	–
New Bedford	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Newton	1	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–
No. Andover	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Quincy	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–
Revere	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–
Seekonk	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Somerville	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Stoneham	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Worcester	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	3	1	1	–	2	–	18	–	7	2	10	–	5	1	3	–

Dysentery, Bacillary

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Adams	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Amesbury	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Amherst	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
Andover	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
Arlington	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Auburn	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–
Ayer	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Becket	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
Belmont	–	–	–	–	–	–	5	–	1	–	–	1	–	–	–	–
Beverly	2	–	5	–	3	–	3	–	–	–	1	–	–	–	–	–
Billerica	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Boston	5	1	35	–	23	1	17	2	9	–	3	3	3	2	23	–
Braintree	–	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–
Brimfield	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Brockton	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–
Brookline	–	–	1	–	–	–	–	–	–	–	–	3	–	–	2	–
Brookfield	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Cambridge	2	–	4	–	1	–	10	–	3	–	1	–	–	2	8	–
Canton	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Chelsea	–	–	3	–	–	–	–	–	–	–	3	–	–	–	–	–
Chicopee	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
Clinton	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Danvers	6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Dedham	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–
E. Bridgewater	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Easthampton	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Everett	–	–	–	–	3	–	–	1	–	–	–	–	–	–	–	–
Fall River	5	–	–	–	10	–	–	–	–	–	–	–	–	–	–	–
Fitchburg	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Foxboro	–	–	–	–	–	–	10	–	–	–	–	–	–	–	–	–
Framingham	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Gloucester	–	–	–	–	–	1	1	–	–	–	1	–	–	–	–	–
Grafton	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–
Greenfield	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Groton	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Haverhill	–	–	4	–	–	–	–	–	–	–	–	–	–	–	–	–
Hingham	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Holyoke	–	–	14	1	–	–	1	–	–	1	–	–	1	–	–	–
Hopkinton	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–
Ipswich	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Lawrence	–	–	1	–	4	–	2	–	–	–	1	–	–	–	–	–
Lexington	–	–	–	–	8	–	28	–	6	–	6	–	1	–	–	–
Lincoln	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
Lowell	1	–	5	2	4	1	4	–	3	–	–	–	5	1	1	–
Lynn	4	–	–	–	1	–	–	1	–	–	–	–	–	–	–	–
Malden	–	–	14	–	15	1	5	–	–	–	3	–	–	–	–	–
Marblehead	–	–	–	–	1	–	–	–	4	–	1	–	2	–	–	–
Medford	–	–	4	–	4	–	–	1	–	–	–	–	1	–	–	2
Melrose	1	–	3	–	–	–	–	–	–	–	4	–	1	–	–	–
Military Est.	2	–	1	–	–	–	5	–	1	–	–	–	–	–	–	–
Milton	–	–	–	–	1	–	–	–	1	1	–	–	–	–	–	–
New Bedford	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–	1
Newburyport	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Newton	–	–	–	–	–	–	1	1	1	–	–	–	–	–	–	–
No. Andover	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–
Northampton	–	–	5	–	1	–	1	–	1	–	–	–	–	–	–	–
Norwood	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
Palmer	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
Peabody	1	–	–	–	1	–	3	–	1	–	–	–	–	–	–	–
Pittsfield	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–
Plainville	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
Quincy	1	–	1	–	1	–	1	–	–	–	–	–	–	–	–	–
Rehoboth	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Revere	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–
Rockland	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–
Salem	6	–	–	–	4	–	–	–	–	–	7	–	2	–	–	–
Saugus	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Scituate	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Shrewsbury	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Somerville	–	–	–	–	2	–	–	–	–	–	–	–	–	–	1	–
Springfield	–	–	–	–	–	–	1	–	2	–	–	1	–	–	–	–
Stoneham	–	–	1	–	2	–	–	–	–	–	–	–	1	–	–	–
Swampscott	–	–	–	–	–	–	–	–	–	–	4	–	–	–	–	–
Tewksbury State Hosp.	6	–	76	–	–	–	–	–	1	–	–	–	–	–	–	–
Wakefield	–	–	–	–	–	–	4	–	–	–	–	–	–	–	–	–
Walpole	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Waltham	14	–	1	–	–	–	22	–	–	–	5	–	3	–	3	–
Wellesley	–	–	5	–	1	–	–	–	–	–	1	–	–	–	–	–
W. Boylston	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–
Westport	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Whitman	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
Wilbraham	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Winchester	–	–	–	–	2	–	–	–	–	–	–	–	–	1	–	–
Winthrop	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Woburn	–	–	5	–	–	–	–	–	–	–	–	–	–	1	–	–
Worcester	–	–	20	–	113	–	104	–	6	–	88	3	96	7	8	–
Wrentham	327	–	–	–	21	–	4	–	25	–	57	–	2	–	6	–
Total	385	1	218	4	239	6	245	8	68	2	188	17	121	18	55	5

Encephalitis, Infectious

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Amherst	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Andover	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Arlington	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
Attleboro	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Auburn	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Ayer	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Barnstable	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Barre	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Belmont	1	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
Billerica	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Boston	1	3	–	–	–	–	–	1	–	2	–	–	–	2	–	–
Braintree	–	–	1	–	2	–	–	–	–	–	–	–	–	–	–	–
Bridgewater	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Brimfield	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Brockton	–	–	2	–	–	–	1	–	–	–	1	–	–	–	1	–
Brookline	–	–	1	1	–	–	–	1	–	–	–	–	–	–	–	–
Cambridge	3	–	1	–	–	–	–	–	–	–	–	–	3	–	–	1
Chatham	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Chelsea	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–
Chelmsford	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Clinton	–	–	–	–	–	1	–	–	–	–	–	–	1	–	–	–
Dover	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
E. Longmeadow	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–
Easton	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Everett	2	–	2	–	–	–	3	–	–	–	–	–	–	–	–	–
Fall River	–	–	–	–	1	2	–	–	–	–	–	–	–	–	–	–
Fitchburg	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Framingham	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Gardner	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–
Greenfield	–	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Halifax	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Haverhill	–	1	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Hingham	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Holyoke	–	–	2	–	1	–	–	1	–	–	–	–	–	–	–	–
Hudson	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Lawrence	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–
Leicester	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Lexington	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–
Longmeadow	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–
Lowell	1	1	1	1	–	–	–	2	–	–	–	–	2	–	2	–
Lunenburg	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Lynn	–	–	1	–	2	2	–	–	–	–	–	–	1	1	1	–
Malden	–	–	1	–	–	–	–	–	–	1	–	–	1	–	–	–
Manchester	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Mansfield	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–
Marlboro	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Marshfield	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Medford	–	1	–	–	1	–	1	–	–	–	–	–	–	–	–	–
Melrose	1	–	1	–	–	–	–	–	–	–	–	–	–	1	–	–
Methuen	–	–	–	–	2	–	–	–	–	1	–	–	–	–	–	–
Middleboro	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Milford	–	–	–	1	–	–	–	–	1	–	–	–	1	–	–	–
Military Est.	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
Millbury	1	–	–	–	1	–	–	–	–	–	–	–	2	–	–	–
Milton	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Needham	–	–	1	–	1	–	–	–	–	–	–	–	–	–	1	–
New Bedford	2	–	–	–	1	–	–	–	–	–	2	1	–	–	2	–
Newburyport	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Newton	–	–	1	–	2	–	–	1	–	–	–	1	–	–	1	–
No. Adams	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Northampton	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
No. Attleboro	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
No. Brookfield	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Palmer	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Pittsfield	1	–	1	–	–	–	2	–	–	–	–	–	2	–	–	–
Princeton	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Quincy	2	–	2	–	1	–	1	–	–	–	1	–	2	–	2	1
Rehoboth	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Salem	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Salisbury	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Saugus	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Somerville	1	–	1	1	–	–	1	1	–	–	–	–	1	–	–	–
Southbridge	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Springfield	1	1	1	1	1	–	–	–	–	–	–	–	1	–	3	–
Sterling	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Stoneham	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Swansea	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Taunton	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Waltham	–	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–
Wareham	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Warren	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Watertown	–	–	1	–	–	–	1	1	–	–	–	–	–	–	1	–

Encephalitis, Infectious — Continued

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Wellesley	2	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Westfield	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Weston	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Weymouth	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Winchendon	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Woburn	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Worcester	–	1	4	1	1	2	–	–	2	–	–	–	8	–	1	–
Yarmouth	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Total	25	13	34	9	23	8	18	10	8	8	8	2	34	4	26	6

Leprosy

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
New Bedford	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Ware	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Total	–	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–

Lymphocytic Choriomeningitis

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Agawam	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Barnstable	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Boston	–	–	1	–	–	–	3	–	–	–	–	–	–	–	1	–
Brockton	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Cambridge	–	–	–	–	–	–	–	–	1	–	2	–	4	–	1	–
Danvers	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
E. Longmeadow	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Fall River	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
Fitchburg	–	–	–	–	–	–	1	–	–	–	–	–	11	–	2	–
Framingham	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Lakeville	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Malden	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Medford	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Middleboro	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Military Est.	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Pittsfield	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Quincy	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–
Somerville	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Springfield	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–
Swampscott	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Townsend	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Waltham	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Weymouth	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Winchester	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Winthrop	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Worcester	1	–	–	–	–	–	1	–	–	–	1	–	1	–	–	–
Total	3	–	4	–	1	–	8	–	4	–	6	–	23	–	9	

Malaria

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Abington	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Acton	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Amesbury	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Amherst	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–
Arlington	1	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Athol	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Attleboro	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–
Barnstable	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–
Bedford	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Belmont	–	–	–	–	–	–	–	–	3	–	1	–	–	–	–	–
Berkeley	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Beverly	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Boston	2	1	1	–	1	1	1	1	125	–	19	–	2	1	1	1

Malaria — Continued

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Bourne	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–
Braintree	–	–	–	–	–	–	–	–	2	–	1	–	1	–	–	–
Bridgewater	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Brockton	–	–	–	–	–	–	–	–	8	1	–	–	–	–	–	–
Brookfield	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Brookline	–	–	1	–	–	–	–	–	3	–	–	–	–	–	–	–
Cambridge	1	–	–	–	–	–	1	–	18	–	3	–	1	–	1	–
Chelsea	–	–	–	–	–	–	–	–	4	–	–	–	–	–	–	–
Chicopee	–	–	1	–	–	1	–	–	2	–	–	–	–	–	–	–
Clinton	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–
Concord	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Dartmouth	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Dedham	–	–	–	–	–	–	–	–	5	–	–	–	–	–	–	–
Douglas	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Easthampton	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Easton	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Everett	–	–	–	–	–	–	–	–	5	–	3	–	–	–	–	–
Fall River	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–
Falmouth	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Fitchburg	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Foxboro	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Framingham	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Franklin	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Gardner	–	–	–	–	–	–	–	–	5	–	–	–	–	–	–	–
Georgetown	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Gloucester	–	–	–	–	–	–	–	–	1	–	–	1	–	–	–	–
Grafton	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Gt. Barrington	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Greenfield	–	–	–	–	–	–	–	–	3	–	1	–	1	–	–	–
Haverhill	–	–	1	–	–	–	–	–	10	–	2	–	–	–	1	–
Heath	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
Hingham	–	–	–	–	1	–	–	–	5	–	–	–	–	–	–	–
Holbrook	–	–	–	–	–	–	–	–	4	–	1	–	–	–	–	–
Holliston	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Hudson	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Lanesboro	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Lawrence	–	–	–	–	–	–	–	–	6	–	2	–	–	–	–	–
Leicester	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Leominster	–	–	1	–	–	–	–	–	2	–	–	–	–	–	–	–
Longmeadow	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Lowell	–	–	–	–	–	–	–	–	1	–	1	–	–	–	1	–
Ludlow	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Lunenburg	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Lynn	–	–	–	–	–	–	–	–	11	–	7	–	–	–	1	–
Lynnfield	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Malden	–	–	–	–	–	–	–	–	10	–	3	1	2	–	–	–
Manchester	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Marblehead	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Marion	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Marlboro	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–
Medford	–	–	–	–	–	–	–	–	9	–	8	–	4	–	1	–
Melrose	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Merrimac	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Methuen	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Middleboro	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Middleton	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Milford	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Military Est.	12	–	99	–	565	–	1026	–	36	–	–	–	–	–	–	–
Millbury	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Milton	–	–	–	–	1	–	–	–	3	–	–	–	–	–	–	–
Monson	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Montague	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Nantucket	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–
Natick	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–
New Bedford	–	–	1	–	–	1	1	–	7	–	1	–	–	–	–	–
Newton	–	–	–	–	–	1	–	–	12	–	1	–	–	1	1	–
Northampton	–	–	1	–	–	–	–	–	–	–	1	–	–	–	1	–
No. Andover	–	–	–	–	–	–	–	–	4	–	1	–	–	–	–	–
Norwood	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Orleans	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Oxford	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Peabody	–	–	–	–	1	–	–	–	11	–	1	–	–	–	1	–
Pittsfield	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Plymouth	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Quincy	1	1	–	–	–	–	–	–	6	–	–	–	–	–	–	–
Raynham	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
Reading	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–
Revere	–	–	1	–	–	–	–	–	3	–	–	–	1	–	–	–
Rockport	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Rowley	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Salem	–	–	–	–	–	–	–	–	6	–	–	–	–	–	–	–
Salisbury	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Saugus	–	–	–	–	–	–	–	–	3	–	–	–	1	–	–	–

Malaria — Continued

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Seekonk	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–
Shrewsbury	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Somerset	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Somerville	–	–	–	–	–	–	–	–	12	–	–	–	–	–	–	–
Southboro	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Southbridge	–	–	–	–	–	–	–	–	2	–	1	–	–	–	–	–
Springfield	–	–	2	–	1	–	–	–	10	–	2	1	1	–	–	–
Stoneham	–	–	–	–	–	–	–	–	2	–	–	–	2	–	–	–
Stoughton	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–
Stow	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Swampscott	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Swansea	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Taunton	–	–	–	–	–	–	–	–	4	–	1	–	–	–	–	–
Templeton	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Townsend	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Tyngsboro	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Uxbridge	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Wakefield	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Waltham	–	–	–	–	–	–	–	–	4	–	1	–	–	–	–	–
Walpole	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Warren	–	–	–	–	–	–	–	–	5	–	–	–	–	–	–	–
Watertown	–	–	–	–	–	–	–	1	2	–	–	–	–	–	–	–
Webster	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Wellesley	–	–	–	–	–	–	–	–	2	–	–	–	1	–	–	–
Westfield	–	–	–	–	–	–	–	–	1	–	1	1	–	–	–	–
W. Springfield	–	–	–	–	–	–	–	–	5	–	–	–	–	–	–	–
Westwood	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Weymouth	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Whately	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Williamstown	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
Wilmington	–	–	–	–	–	1	–	–	1	–	–	–	–	–	–	–
Winchendon	–	–	–	–	–	–	–	–	1	–	2	–	–	–	–	–
Winchester	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Winthrop	–	–	–	–	–	–	–	–	1	–	2	–	–	–	–	–
Woburn	–	–	–	–	–	–	–	–	6	–	1	–	–	–	–	–
Worcester	–	–	2	–	–	1	1	–	35	–	8	–	–	–	–	–
Total	18	3	116	–	572	7	1031	2	509	1	91	4	23	2	10	1

Meningitis, Meningococcus

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Abington	–	–	–	–	1	–	–	–	–	–	–	–	–	1	–	–
Acton	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–
Acushnet	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–
Adams	–	–	1	–	2	–	1	–	1	1	–	–	–	–	–	–
Agawam	1	–	1	–	2	1	–	–	–	–	–	–	–	–	1	–
Amesbury	2	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Amherst	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–
Arlington	–	–	2	–	5	2	1	–	1	–	–	–	–	–	–	–
Ashby	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Ashfield	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Ashland	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–
Athol	–	–	1	–	–	–	–	–	–	–	–	1	–	–	–	–
Attleboro	–	–	3	–	3	–	1	–	–	–	–	–	–	–	–	–
Auburn	–	–	3	–	1	1	1	–	–	–	–	–	–	–	–	–
Ayer	1	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Barnstable	1	–	8	1	7	1	–	–	–	–	–	–	–	–	–	–
Bedford	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Bellingham	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Belmont	–	–	3	2	–	–	–	–	–	–	–	–	–	–	–	–
Beverly	1	–	1	–	–	–	1	1	–	–	–	–	–	–	–	–
Billerica	–	–	2	1	–	–	–	–	–	–	–	–	–	–	–	–
Boston	36	13	168	43	137	25	48	5	23	3	13	9	15	5	6	1
Bourne	–	–	1	–	2	–	–	–	–	–	–	–	–	–	–	–
Boxboro	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Braintree	2	–	1	–	5	1	–	–	1	–	–	–	–	–	–	–
Bridgewater	–	–	2	–	2	–	–	–	–	–	–	–	–	–	–	–
Brimfield	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Brockton	4	2	9	1	3	–	1	1	2	–	–	–	–	1	2	–
Brookfield	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–
Brookline	2	–	5	2	2	1	1	1	1	–	1	–	3	2	–	–
Cambridge	10	–	23	4	7	2	2	–	2	–	1	1	4	1	3	–
Canton	–	–	2	1	2	1	–	–	1	–	–	–	–	–	–	–
Carver	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–

Meningitis, Meningococcus — Continued

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Charlton	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Chelmsford	–	–	1	–	1	–	1	–	–	–	–	–	–	–	–	–
Chelsea	3	1	10	1	7	2	2	–	–	–	–	–	–	–	–	–
Chicopee	–	–	2	–	4	2	2	–	1	1	–	–	–	–	–	–
Clarksburg	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Clinton	–	1	1	–	–	1	–	–	–	–	–	–	–	–	–	–
Cohasset	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Danvers	1	–	1	–	–	–	–	1	–	–	–	–	–	–	–	–
Dartmouth	–	–	1	–	1	–	–	1	–	–	–	–	–	–	–	–
Dedham	1	–	4	–	1	3	1	–	–	–	–	–	–	–	–	–
Dennis	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Dracut	1	–	–	–	–	–	–	–	1	1	–	–	1	–	–	–
Dudley	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–
E. Bridgewater	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Easthampton	–	–	1	–	3	1	1	–	–	–	–	–	–	–	1	–
Easton	–	–	1	–	1	–	1	–	1	–	–	–	–	–	–	–
Edgartown	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Erving	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
Everett	2	–	8	–	6	2	2	–	2	–	–	–	1	–	1	–
Fairhaven	–	–	2	–	1	1	–	–	–	–	–	–	–	1	–	–
Fall River	4	1	21	2	11	2	4	–	8	–	1	1	4	–	3	–
Falmouth	–	–	4	–	1	–	–	–	–	–	–	–	–	–	–	–
Fitchburg	4	–	7	4	3	1	3	1	2	1	1	–	1	–	–	–
Foxboro	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
Framingham	–	–	2	1	2	–	1	–	1	–	2	–	1	–	–	–
Franklin	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–
Gardner	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Gloucester	1	–	2	1	1	–	–	–	1	1	–	–	–	–	–	–
Grafton	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Gt. Barrington	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Greenfield	2	–	3	–	1	–	1	–	–	–	–	–	–	–	1	–
Groveland	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Hamilton	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Hanover	–	–	1	–	1	1	1	–	–	–	–	–	–	–	–	–
Hanson	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Hardwick	–	–	1	–	2	–	–	–	–	–	–	–	–	–	–	–
Harwich	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Haverhill	1	–	5	1	3	–	4	–	–	–	1	1	1	1	1	–
Hingham	–	–	2	–	1	1	–	–	–	–	–	–	–	–	1	–
Holbrook	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Holden	–	–	1	–	–	–	–	–	–	–	–	–	1	–	1	1
Holyoke	–	–	10	1	3	–	3	–	1	–	–	–	1	–	–	–
Hopedale	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Hopkinton	2	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Hudson	–	–	–	–	1	–	–	–	–	–	–	1	–	–	–	1
Hull	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Ipswich	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Kingston	–	–	2	–	1	–	–	–	–	–	–	–	–	–	–	–
Lakeville	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Lawrence	–	–	3	1	6	2	–	–	2	1	–	–	–	–	2	2
Lee	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Leominster	4	2	3	–	1	–	–	–	3	–	–	–	–	–	–	–
Lenox	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Lexington	2	–	–	–	1	–	–	–	1	–	–	–	3	–	–	–
Longmeadow	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Lowell	5	1	17	2	20	3	4	–	5	1	3	–	2	1	–	–
Ludlow	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Lunenburg	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Lynn	4	–	8	2	5	4	2	1	1	–	1	–	1	–	1	–
Lynnfield	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Malden	–	–	9	2	8	1	2	–	4	1	1	–	–	1	1	–
Manchester	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Mansfield	2	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–
Marblehead	–	–	–	–	1	–	2	–	1	–	–	–	–	–	–	–
Marlboro	1	1	–	1	2	–	–	–	–	–	–	–	–	–	–	–
Marshfield	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Maynard	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Medford	3	–	5	–	3	–	2	–	2	–	–	–	2	–	–	–
Medway	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Melrose	2	–	2	1	2	–	–	–	–	–	–	–	1	–	–	–
Methuen	–	–	4	1	1	1	–	–	–	–	–	–	–	–	–	–
Middleboro	2	–	2	–	4	–	1	–	–	–	1	–	–	–	–	–
Milford	3	–	2	1	1	–	–	–	1	1	–	–	–	–	–	–
Military Est.	21	–	135	–	21	–	3	–	1	–	–	–	–	–	–	–
Millbury	–	–	1	1	–	–	1	1	1	–	–	–	–	–	–	–
Millville	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–
Milton	1	–	1	–	4	–	1	–	–	–	–	–	–	–	–	–
Montague	–	–	1	–	1	–	–	–	1	–	2	–	–	–	–	–
Nahant	–	–	–	–	1	–	1	–	–	–	–	–	1	–	–	–
Natick	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–
Needham	–	–	2	–	1	–	–	–	–	–	–	–	1	–	1	–
New Bedford	5	2	6	7	–	2	3	1	1	–	–	–	1	1	1	–
New Braintree	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–

Meningitis, Meningococcus — Continued

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Newbury	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Newburyport	–	–	2	–	–	–	–	–	1	1	–	–	–	–	–	–
Newton	2	–	5	2	8	–	5	–	3	–	2	–	2	–	3	–
No. Adams	–	–	1	–	1	1	2	–	–	1	–	–	–	–	–	–
No. Attleboro	–	–	–	–	2	–	1	–	1	–	–	–	–	–	–	–
No. Brookfield	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
No. Andover	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
No. Reading	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Norfolk	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Northampton	1	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–
Northbridge	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Norton	–	–	–	–	2	–	–	–	–	1	–	–	–	–	–	–
Norwood	2	–	3	1	2	–	1	–	1	–	–	–	–	–	–	–
Oxford	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
Palmer	–	–	–	–	2	–	2	–	–	–	–	–	–	–	1	–
Peabody	1	1	–	–	1	–	–	–	–	–	–	–	–	–	1	–
Pittsfield	1	1	2	–	3	3	–	–	–	–	1	–	2	–	–	–
Plymouth	2	1	4	–	–	–	2	–	–	–	–	–	–	–	–	–
Quincy	1	–	7	3	10	–	7	2	5	–	3	–	2	–	1	–
Randolph	1	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–
Reading	1	–	1	1	2	–	–	–	–	–	–	–	–	–	–	–
Rehoboth	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–
Revere	3	–	6	1	3	–	–	–	–	–	–	–	–	–	–	–
Rockland	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–
Rockport	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Rowley	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Rutland	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Salem	1	1	5	2	1	–	–	1	2	1	–	–	–	–	4	1
Salisbury	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Saugus	1	–	1	–	2	–	–	–	–	–	–	–	–	–	–	–
Scituate	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Seekonk	–	–	–	–	1	1	1	–	–	–	–	–	–	–	–	–
Sharon	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–
Sheffield	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
Shrewsbury	–	–	2	–	2	–	–	–	–	–	–	–	–	–	–	–
Somerset	–	–	2	–	1	1	–	–	–	–	–	–	–	–	–	–
Somerville	4	–	18	1	10	1	2	–	2	–	3	–	2	–	–	–
South Hadley	1	–	1	1	–	–	1	–	–	–	–	–	–	–	–	–
Southboro	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–
Southbridge	–	–	7	1	–	–	–	–	1	1	–	–	–	–	–	–
Spencer	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Springfield	5	1	15	1	10	3	8	–	3	–	–	–	1	1	3	–
Stoneham	1	–	3	1	–	–	–	–	–	–	–	–	–	–	–	–
Stoughton	–	–	2	–	1	–	1	–	–	–	–	–	–	–	–	–
Sturbridge	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–
Sudbury	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Sutton	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–
Swampscott	–	–	2	–	2	–	–	–	–	–	1	–	–	–	–	–
Swansea	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Taunton	–	1	4	1	1	–	1	–	–	–	–	–	–	1	–	–
Templeton	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–
Topsfield	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–
Townsend	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Uxbridge	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Wakefield	–	–	2	–	1	–	1	–	–	–	–	–	1	–	–	–
Walpole	1	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–
Waltham	1	–	9	2	3	–	–	–	2	1	2	–	–	–	1	–
Ware	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–
Wareham	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–
Washington	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Watertown	–	–	5	–	3	–	1	–	2	–	–	1	–	–	1	–
Wayland	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Webster	–	–	2	–	4	–	–	–	–	–	–	–	–	–	–	–
Wellesley	–	–	–	–	2	–	–	–	–	–	1	–	–	–	1	–
Wenham	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Westboro	1	–	2	–	–	–	1	–	–	–	–	–	–	–	–	–
West Bridgewater	1	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–
West Springfield	1	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
Westfield	–	–	1	1	6	2	–	–	–	–	1	–	–	–	–	–
Westport	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Weston	–	–	–	–	1	–	–	1	–	–	–	–	–	–	–	–
Westwood	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Weymouth	2	1	6	2	2	–	–	–	2	–	–	–	–	–	1	–
Whately	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
Wilbraham	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Williamstown	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Wilmington	3	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Winchester	–	–	2	–	2	–	–	–	–	–	–	–	1	–	–	–
Winchendon	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Winthrop	–	–	4	1	2	1	1	–	–	–	–	–	1	1	–	–
Woburn	1	–	1	–	1	1	–	–	–	–	–	–	–	–	–	–
Worcester	9	2	37	4	13	1	4	2	5	3	1	–	3	–	1	1
Wrentham	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Total	191	34	736	119	456	81	161	20	116	21	47	15	66	20	50	9

Meningitis, Pfeiffer Bacillus

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Acton	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Adams	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Amesbury	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Arlington	–	–	–	–	–	–	2	–	–	–	–	–	1	–	–	–
Attleboro	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Auburn	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Barnstable	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
Belmont	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
Beverly	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Billerica	–	–	–	–	–	1	–	–	1	–	–	–	–	–	–	–
Bolton	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–
Boston	4	2	6	5	7	4	5	–	7	3	8	3	1	2	1	2
Brockton	1	–	2	1	2	1	2	–	1	–	3	–	–	–	4	–
Cambridge	1	1	1	–	1	–	3	–	1	–	3	–	1	–	1	–
Canton	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Carlisle	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
Charlton	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Chelsea	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Cheshire	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Chicopee	1	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–
Cohasset	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Concord	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Dalton	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–
Dartmouth	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
East Bridgewater	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
E. Longmeadow	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Easthampton	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Everett	–	–	–	–	–	–	1	1	1	1	2	–	1	–	–	–
Fairhaven	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
Fall River	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Falmouth	–	–	–	–	–	–	–	–	1	1	–	–	–	–	1	–
Fitchburg	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Framingham	1	–	–	1	2	–	–	–	–	–	1	–	–	–	–	–
Franklin	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Gardner	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
Gloucester	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Greenfield	–	–	1	1	–	1	–	–	–	–	–	–	–	–	–	–
Hadley	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Hampden	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Hanson	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Hardwick	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
Harvard	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Hatfield	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Haverhill	–	–	–	–	–	–	–	–	2	–	–	1	–	–	2	–
Hinsdale	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Holyoke	1	–	1	–	–	–	–	–	–	–	1	–	2	–	1	–
Hull	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Huntington	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–
Lawrence	1	1	1	–	2	2	1	–	–	–	2	–	1	1	2	2
Lee	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–
Leominster	2	2	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Lowell	–	1	–	–	–	1	–	–	–	–	2	1	1	–	3	–
Lynn	–	–	1	–	1	1	–	–	–	1	–	–	3	1	–	–
Lynnfield	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Malden	–	1	–	–	–	–	1	–	1	1	–	–	2	1	–	–
Mansfield	–	–	–	–	–	–	1	1	–	–	1	–	–	–	–	–
Marlboro	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Marshfield	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Maynard	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Medford	–	–	1	1	1	–	–	–	1	–	1	–	–	–	–	–
Medway	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Methuen	–	–	2	1	–	–	1	1	–	–	–	–	–	–	–	1
Melrose	–	–	1	–	–	–	–	1	–	–	–	–	–	–	–	–
Middleboro	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Milford	–	–	1	1	1	–	1	–	–	–	–	–	–	–	–	–
Millbury	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–
Milton	–	–	–	–	–	–	1	–	–	–	1	–	–	–	1	–
Monson	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–
Natick	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Needham	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
New Bedford	1	–	–	–	1	1	1	1	3	1	–	1	2	–	1	–
Newburyport	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–
Newton	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
North Adams	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	1
North Attleboro	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–
Northampton	–	–	–	–	–	–	–	–	–	–	2	1	–	–	–	–
Northbridge	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Oxford	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–
Palmer	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Paxton	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
Peabody	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–
Petersham	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–

Meningitis, Pfeiffer Bacillus — Continued

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Pittsfield	–	–	1	1	1	–	–	–	–	–	–	–	1	–	1	–
Quincy	1	–	–	–	–	–	–	1	–	–	2	–	2	–	–	–
Randolph	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Reading	1	–	–	–	–	–	–	–	1	–	–	–	1	1	–	–
Rehoboth	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Revere	–	–	–	–	–	–	–	–	–	–	1	1	1	–	–	–
Rockland	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Rockport	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–
Royalston	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
Salem	1	–	2	–	2	2	1	–	1	–	–	–	1	–	1	–
Saugus	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–
Seekonk	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Sharon	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Somerville	3	1	–	–	–	1	1	–	–	–	1	1	1	1	–	–
South Hadley	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Southboro	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Southbridge	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–
Spencer	–	–	–	–	–	–	–	1	–	–	–	–	1	–	–	–
Springfield	3	1	3	2	1	–	3	1	2	1	1	–	4	1	1	1
Stoneham	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Stow	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Sudbury	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Taunton	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
Templeton	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
Tisbury	–	–	–	–	1	–	1	1	–	–	–	–	–	–	–	–
Tyngsboro	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
Wakefield	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Wareham	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Watertown	–	–	1	–	1	–	1	1	–	–	–	–	–	–	–	–
Wellesley	–	–	–	–	1	–	–	–	–	–	1	–	–	–	1	–
West Boylston	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
West Brookfield	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
West Springfield	–	–	–	–	–	–	–	–	–	–	2	–	–	–	1	–
Westfield	–	–	–	–	–	–	–	–	–	–	–	–	1	–	2	1
Westwood	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Weymouth	–	–	–	–	3	1	–	–	–	–	–	–	–	–	–	–
Wilbraham	–	–	1	1	–	1	–	–	–	–	–	–	–	–	–	–
Wilmington	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Winchester	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–
Winthrop	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–
Woburn	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–
Worcester	–	–	2	–	–	–	–	–	3	–	5	3	2	–	4	1
Total	29	12	36	20	38	22	32	15	38	15	49	15	44	12	43	12

Meningitis, Pneumococcal

	1942		1943*		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	
Abington	–	–	–		–	–	–	–	1	–	–	–	–	–	–	–
Agawam	–	–	–		1	–	–	–	–	–	–	–	–	–	–	–
Amherst	–	–	–		–	–	1	–	1	–	–	–	–	–	–	–
Andover	–	–	–		–	–	1	–	–	–	–	–	–	–	–	–
Ashland	–	–	–		–	–	–	–	–	–	1	–	–	–	–	–
Athol	–	–	–		–	1	–	–	–	–	–	–	–	–	–	–
Attleboro	–	–	–		1	–	1	1	–	–	–	–	–	–	–	–
Avon	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Barnstable	–	–	–		–	–	–	–	–	–	–	–	1	–	–	–
Barre	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Belchertown	–	–	–		–	–	–	–	–	1	–	–	–	–	–	–
Belmont	–	–	–		–	–	–	–	1	–	–	–	–	–	–	–
Beverly	1	–	–		1	1	–	–	–	–	1	–	–	–	–	–
Billerica	–	–	–		1	1	–	–	–	–	1	1	–	–	–	–
Boston	5	5	6		49	8	15	7	12	7	9	9	4	3	1	–
Bourne	–	–	1		–	–	–	–	–	–	–	–	–	–	–	–
Braintree	–	–	–		–	–	–	–	–	–	–	–	1	–	–	–
Bridgewater	–	–	1		–	–	–	–	–	–	–	1	–	–	–	–
Brockton	3	2	1		2	1	–	–	1	2	–	–	–	–	–	–
Brookline	2	–	2		1	–	1	–	–	–	–	1	1	–	–	–
Cambridge	5	2	3		4	4	4	2	4	3	5	4	–	–	2	–
Canton	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Chelsea	–	–	–		–	–	–	–	–	–	–	–	–	–	1	–
Chesterfield	–	–	–		–	–	–	–	–	–	–	–	1	–	–	–
Chicopee	4	3	–		1	–	–	–	1	1	–	–	1	1	–	–
Cohasset	1	1	–		1	–	–	–	1	–	–	–	–	–	–	–
Colrain	–	–	–		–	–	–	–	–	–	–	1	–	–	–	–

*Deaths not available.

Meningitis, Pneumococcal — Continued

	1942		1943*		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Conway	–	–	–		–	–	–	1	–	–	–	–	–	–	–	–
Danvers	–	–	–		–	–	–	–	–	–	–	–	–	–	1	–
Dartmouth	–	–	–		1	–	–	–	–	–	–	–	–	–	–	–
Dracut	–	–	–		–	1	–	–	–	–	–	–	–	–	–	–
Duxbury	–	–	–		–	–	–	–	–	–	–	–	–	1	–	–
Easthampton	–	–	–		1	–	–	–	–	–	–	–	–	–	–	–
East Bridgewater	–	–	1		–	–	–	–	–	–	–	–	–	–	–	–
Easton	1	1	–		–	–	–	–	–	–	–	–	–	–	–	–
Everett	–	–	2		–	–	1	1	2	–	–	–	–	–	–	–
Fall River	–	–	2		–	–	1	1	2	1	–	–	–	–	1	–
Falmouth	–	–	–		1	–	–	–	–	–	–	–	–	–	–	–
Fitchburg	1	–	–		–	–	–	–	1	–	–	–	–	–	1	–
Foxboro	–	–	1		–	–	–	–	1	1	–	–	–	–	–	–
Framingham	–	–	–		1	–	–	–	1	–	1	–	1	–	–	–
Franklin	–	–	–		1	1	–	–	–	–	–	–	–	–	–	–
Gill	–	–	–		–	–	–	–	–	–	–	1	–	–	–	–
Gloucester	2	1	1		–	1	–	1	1	–	–	–	1	1	–	–
Grafton	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Greenfield	–	–	–		–	–	–	–	–	–	1	–	–	–	–	–
Hampden	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Haverhill	–	–	1		–	–	–	–	–	–	1	–	–	–	1	–
Hingham	–	–	–		–	–	1	–	–	–	–	–	–	–	–	–
Holliston	–	–	–		–	–	–	–	–	–	1	–	–	–	–	–
Holyoke	2	–	1		1	1	–	–	–	–	–	–	1	–	–	–
Hudson	–	–	1		–	–	–	–	–	–	–	–	–	–	–	–
Ipswich	–	–	1		–	–	–	–	–	–	–	–	–	–	–	–
Lawrence	–	–	–		2	2	1	1	–	–	1	1	–	–	1	–
Leominster	–	–	–		1	1	–	–	–	–	1	–	–	–	–	–
Lexington	1	–	–		2	1	–	–	–	–	1	1	–	–	–	–
Lowell	1	1	1		–	–	–	–	–	–	–	–	1	–	1	–
Lunenburg	–	–	–		–	–	–	–	1	–	–	–	–	–	–	–
Lynn	–	1	1		2	2	–	–	2	2	–	–	1	1	2	1
Malden	–	–	3		1	–	–	–	1	1	–	–	–	–	–	–
Manchester	–	–	–		–	1	–	–	–	–	–	–	–	–	–	–
Mansfield	–	–	–		–	–	–	–	1	1	–	–	–	–	–	–
Marblehead	–	–	2		–	–	–	–	2	–	–	–	–	–	–	–
Marion	–	–	–		1	–	–	–	–	–	–	–	–	–	–	–
Mattapoisett	–	–	–		–	–	–	–	1	–	–	–	–	–	–	–
Medford	–	–	1		1	–	–	1	–	–	–	1	1	–	–	–
Melrose	–	–	–		1	–	–	–	–	–	1	1	–	–	–	–
Merrimac	–	–	–		1	–	–	–	–	–	–	–	–	–	–	–
Methuen	1	1	1		–	–	–	–	–	–	–	–	2	–	–	–
Milford	–	–	1		–	–	–	–	–	–	–	–	–	–	–	1
Millbury	–	–	–		–	1	–	–	–	–	–	–	–	–	–	–
Natick	–	–	–		–	–	1	1	1	–	–	–	–	–	–	–
Needham	–	–	–		–	–	–	–	–	–	–	–	–	–	1	–
New Bedford	–	–	2		–	–	2	2	–	1	–	–	1	–	–	–
Newburyport	–	–	–		–	1	–	–	–	–	–	–	1	–	–	–
Newton	–	–	–		–	1	2	–	–	–	–	–	–	–	–	–
Norfolk	–	1	–		–	–	–	–	–	–	–	–	–	–	–	–
North Reading	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Northampton	–	–	–		–	–	1	–	1	–	–	–	–	–	–	–
Northboro	–	–	–		–	–	–	–	1	1	–	–	–	–	–	–
Northbridge	–	–	–		–	–	–	–	–	–	–	–	1	1	–	–
Norwood	–	–	–		1	–	1	–	–	–	–	–	–	–	–	–
Oak Bluffs	–	–	–		–	–	–	–	–	–	–	–	–	–	–	1
Oxford	–	–	1		–	–	–	–	–	–	–	–	–	–	–	–
Palmer	–	–	–		–	–	–	–	–	–	1	–	–	–	–	–
Pittsfield	–	–	1		–	1	–	–	1	–	1	–	–	–	–	–
Quincy	–	–	–		1	1	–	1	1	–	1	1	1	2	1	–
Randolph	–	–	1		–	–	–	–	–	–	–	–	–	–	–	–
Reading	–	–	–		–	–	1	–	–	–	–	–	–	–	–	–
Revere	–	–	–		–	–	–	–	–	–	–	–	–	1	–	1
Salem	1	1	–		3	–	–	–	–	–	2	–	–	–	1	–
Sandwich	–	–	–		–	–	–	–	–	–	–	–	–	–	1	–
Sharon	–	–	–		–	–	–	–	–	–	–	–	–	1	–	–
Shrewsbury	–	–	–		1	1	–	–	–	–	–	–	–	–	–	–
Somerville	–	–	1		2	1	–	1	–	–	–	1	2	1	–	1
Southbridge	–	–	–		2	1	–	–	–	–	–	–	–	–	–	–
Spencer	–	–	1		–	–	–	–	–	–	–	–	–	–	–	–
Springfield	2	2	4		3	4	1	1	–	–	–	–	2	2	–	–
Stoneham	–	–	–		–	–	–	–	–	–	–	–	–	–	–	1
Sturbridge	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Sunderland	–	–	–		–	1	–	–	–	–	–	–	–	–	–	–
Swampscott	–	–	–		–	–	1	–	–	–	–	–	–	–	–	–
Sutton	–	–	–		2	–	–	–	–	–	–	–	–	–	–	–
Taunton	–	1	–		–	–	–	–	–	–	–	–	–	–	–	–
Tewksbury	–	–	–		–	–	–	–	–	–	–	–	1	–	1	–
Wakefield	–	–	–		–	–	–	–	–	–	–	–	–	–	1	1
Walpole	–	–	1		–	–	–	–	–	–	–	–	–	–	–	–
Waltham	–	–	–		1	–	–	–	–	–	–	–	–	–	–	–
Ware	–	–	–		1	1	–	–	–	–	–	–	–	–	–	–

*Deaths not available.

Meningitis, Pneumococcal — Continued

	1942		1943*		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Warren	–	–	–		–	–	–	–	–	–	–	–	–	–	1	–
Watertown	1	–	–		–	–	–	–	–	–	1	–	–	–	–	–
Webster	–	1	–		–	–	–	–	–	–	–	–	–	–	–	–
Wellesley	1	–	–		–	–	–	–	–	–	–	–	–	–	1	–
Westfield	1	1	1		–	–	–	–	–	–	–	–	–	–	–	–
Westport	–	–	–		2	2	–	–	–	–	–	–	–	–	–	–
Weston	–	–	–		–	–	–	–	–	–	–	–	2	1	–	–
West Springfield	–	–	–		–	–	–	–	–	–	–	–	1	1	–	–
Weymouth	1	1	–		–	–	–	–	–	–	–	–	–	–	–	–
Winchester	–	–	–		–	–	–	1	–	–	–	–	–	–	–	–
Winthrop	–	–	–		–	–	–	–	1	1	–	–	–	–	–	–
Woburn	–	–	1		1	1	–	–	–	1	–	–	–	–	–	–
Worcester	2	1	9		1	1	5	1	4	2	2	–	1	–	3	1
Total	46	27	58	51	71	45	42	24	48	26	30	24	30	17	23	8

Meningitis, Other Forms

	1942		1943*		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Adams	–	–	–		–	–	–	–	–	–	–	–	1	–	–	–
Arlington	–	–	–		1	–	1	–	–	–	–	–	–	–	–	–
Ashland	–	–	–		–	–	–	–	–	–	–	–	–	–	1	–
Athol	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Attleboro	1	–	–		–	–	2	–	–	–	–	–	–	–	–	–
Barnstable	–	–	–		1	–	–	–	–	–	–	–	–	–	–	–
Beverly	–	–	1		2	–	–	–	–	–	–	–	–	–	–	–
Blackstone	–	–	–		–	–	–	–	–	–	–	–	–	1	–	–
Boston	8	1	17		9	–	5	1	1	1	1	2	–	–	–	1
Braintree	–	–	–		–	–	–	–	–	–	–	–	1	–	–	–
Brockton	2	–	–		–	–	–	–	–	–	–	–	–	–	1	–
Brookline	–	–	–		–	–	–	1	–	–	1	–	–	–	–	–
Cambridge	1	–	2		1	1	–	–	1	1	1	–	2	1	–	–
Carver	–	–	–		–	–	–	–	–	–	–	1	–	–	–	–
Chelsea	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Chicopee	–	–	–		–	–	–	–	–	–	–	–	1	–	–	–
Dedham	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Dracut	–	–	–		–	–	–	–	–	–	1	–	–	–	–	–
Easton	–	–	–		1	–	–	–	–	–	–	–	–	–	–	–
Everett	–	–	–		–	–	2	–	–	–	1	–	–	–	–	–
Fairhaven	–	–	–		–	–	–	–	–	1	–	–	–	–	1	–
Fall River	–	–	1		–	–	1	1	–	–	–	–	–	–	2	–
Foxboro	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Gardner	–	–	–		–	–	–	–	–	–	–	–	–	–	–	1
Greenfield	–	–	1		–	–	–	–	–	–	–	–	–	–	–	–
Groton	–	–	–		–	–	–	–	–	–	–	–	1	–	–	–
Groveland	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Haverhill	–	1	–		–	–	–	–	–	–	–	–	1	–	–	–
Hingham	–	–	–		–	–	–	1	–	–	–	–	–	–	–	–
Holbrook	–	–	–		–	–	–	–	–	–	1	–	–	–	–	–
Hudson	–	1	–		–	–	–	–	–	–	–	–	–	–	–	–
Lawrence	–	–	–		–	1	–	–	–	1	–	–	–	–	–	–
Lowell	–	1	–		–	–	–	–	1	–	–	–	1	–	–	1
Ludlow	–	–	–		–	–	1	–	–	–	–	–	–	–	–	–
Lynn	–	–	1		–	1	1	–	–	–	–	–	–	–	–	–
Malden	1	1	–		–	–	–	–	–	–	–	–	1	–	2	–
Medfield	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Milford	–	–	–		–	–	–	–	–	–	–	–	–	–	2	–
Milton	–	–	–		–	–	–	–	1	–	–	–	–	–	–	–
Montague	–	1	–		–	–	–	–	–	–	–	–	–	–	–	–
Needham	–	–	–		1	–	–	–	–	–	–	–	–	–	–	–
New Bedford	–	1	–		3	1	–	1	–	–	–	1	–	–	–	–
Northampton	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Norwood	–	–	1		–	–	–	–	–	–	1	–	–	–	–	–
Orleans	–	–	–		1	–	–	–	–	–	–	–	–	–	–	–
Palmer	–	–	–		–	–	–	1	1	1	–	–	–	–	–	1
Phillipston	–	–	–		–	–	–	–	1	–	–	–	–	–	–	–
Pittsfield	2	–	–		–	–	–	–	–	–	–	–	–	–	–	1
Plymouth	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Quincy	–	–	–		–	1	–	–	–	–	–	1	–	–	1	–
Randolph	–	–	–		–	–	2	–	–	–	–	–	–	–	–	–
Revere	2	–	–		–	–	1	–	–	–	–	–	–	–	–	–
Salem	–	–	–		–	–	–	–	–	–	–	–	–	–	1	–
Saugus	–	–	–		–	–	–	–	–	–	–	–	–	1	–	–

*Deaths not available.

Meningitis, Other Forms — Continued

	1942		1943*		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Scituate	–	–	–		–	–	1	–	–	–	–	–	–	–	–	–
Somerville	–	–	–		–	–	1	–	–	–	–	–	–	–	–	–
Springfield	1	–	2		–	1	1	–	1	–	1	–	–	–	–	–
Swampscott	–	–	1		–	–	–	–	–	–	–	–	–	–	–	–
Taunton	1	1	–		–	–	–	–	1	–	1	–	–	–	–	–
Uxbridge	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Wakefield	–	1	–		–	–	–	–	–	–	–	–	1	–	1	–
Walpole	–	–	–		–	–	–	–	–	–	–	–	1	–	–	–
Waltham	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Wareham	–	–	–		–	–	–	–	1	–	–	–	–	–	–	–
Webster	–	2	–		–	–	–	–	–	–	–	–	–	–	–	–
West Bridgewater	–	–	–		–	–	1	–	–	–	–	–	–	–	–	–
West Springfield	–	–	1		–	–	–	–	–	–	–	–	–	–	–	–
Weymouth	–	–	–		–	–	1	–	–	–	–	–	–	–	1	–
Winthrop	–	–	–		–	–	1	–	1	–	–	–	–	–	–	–
Worcester	–	–	–		–	–	2	1	–	–	1	–	–	–	1	–
Wrentham	–	–	–		–	–	1	–	–	–	–	–	–	–	1	–
Total	29	11	28	11	20	6	25	7	10	5	10	5	11	3	15	5

Meningitis, Undetermined

	1942		1943*		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Adams	–	–	–		–	–	–	–	–	–	–	–	–	2	1	–
Agawam	–	–	–		–	–	–	–	–	–	1	–	–	–	–	–
Amesbury	–	–	–		–	–	–	–	1	–	1	–	–	–	–	–
Amherst	–	–	–		–	–	–	–	–	–	–	–	–	–	–	1
Andover	–	–	–		1	–	–	–	–	–	–	–	1	–	–	–
Arlington	–	–	3		–	–	–	–	–	–	–	–	2	–	1	–
Ashburnham	–	–	–		–	–	–	–	–	–	–	–	1	–	–	–
Ashland	–	–	1		–	–	1	–	–	–	–	–	–	–	–	–
Attleboro	–	–	–		1	–	–	1	–	–	–	–	–	–	–	–
Auburn	–	–	–		1	1	–	–	–	–	–	–	1	–	–	–
Avon	–	–	–		–	–	–	–	–	–	–	–	1	–	–	
Bedford	–	–	–		–	–	–	–	–	–	–	–	–	–	1	–
Belmont	–	–	1		–	–	–	–	1	–	–	–	–	–	–	–
Beverly	–	–	–		–	1	–	–	–	–	–	–	1	–	–	1
Boston	1	–	31		15	8	11	7	3	9	1	10	2	6	1	4
Bourne	–	–	2		–	–	–	–	–	–	–	–	–	–	–	–
Braintree	–	–	1		–	–	2	–	–	–	–	–	–	–	1	–
Bridgewater	–	–	1		–	–	1	–	–	–	–	–	–	–	–	–
Brockton	1	–	1		4	–	–	1	–	–	2	1	3	1	1	–
Brookline	–	–	–		–	–	1	–	2	–	–	–	–	–	–	–
Buckland	–	–	–		–	–	–	–	–	1	–	–	–	–	–	–
Cambridge	–	–	6		5	–	3	2	2	2	6	2	4	1	1	1
Canton	–	–	1		–	–	–	1	–	–	–	–	–	–	–	–
Carlisle	–	–	–		2	–	–	–	–	–	–	–	–	–	–	–
Charlton	–	–	1		–	–	–	–	–	–	–	–	–	–	–	–
Chelsea	–	–	1		1	–	1	1	–	–	–	–	–	–	–	–
Chelmsford	–	–	–		–	–	–	–	–	–	–	–	–	–	2	–
Chicopee	–	–	–		–	–	–	–	1	–	1	–	1	–	–	–
Clinton	–	–	–		–	–	–	1	–	–	–	–	–	–	–	–
Dalton	–	–	–		–	–	–	–	1	–	–	–	–	–	–	–
Dracut	1	–	–		–	–	–	–	–	–	–	1	–	–	–	–
Dudley	–	–	–		–	–	–	–	–	–	–	–	1	–	–	–
East Brookfield	–	–	–		–	–	–	–	–	–	–	–	1	–	–	–
Easthampton	–	–	–		–	–	1	–	–	–	–	–	–	–	–	–
Easton	–	–	–		2	–	–	–	–	–	–	–	–	–	–	–
Everett	–	–	1		1	–	–	1	–	–	–	–	1	1	–	–
Fall River	–	–	4		2	1	–	1	–	–	3	–	–	–	9	–
Falmouth	–	–	1		–	1	–	–	–	–	–	–	–	–	–	–
Fitchburg	–	–	2		1	–	–	–	1	–	–	–	–	–	–	–
Foxborough	–	–	–		–	–	–	–	–	–	–	–	–	–	1	–
Framingham	–	–	1		1	–	–	–	2	–	–	–	–	–	1	–
Gloucester	–	–	1		–	–	–	–	–	1	–	–	–	1	–	–
Grafton	–	–	–		–	–	–	–	–	–	–	–	–	–	1	1
Great Barrington	–	–	–		–	–	–	–	–	–	1	–	–	–	–	–
Greenfield	–	–	–		–	–	–	–	–	–	–	–	–	–	1	–
Hanover	–	–	1		–	–	–	–	–	–	–	–	–	–	1	–
Hanson	–	–	–		–	–	–	–	1	–	–	–	–	–	–	–
Haverhill	–	–	2		–	–	3	–	2	–	3	1	1	–	2	–
Hingham	–	–	–		2	–	–	–	–	–	–	–	–	–	–	–
Holden	–	–	–		–	–	–	–	–	–	1	–	–	–	–	–
Holbrook	–	–	1		–	–	–	–	–	–	–	–	–	–	–	–
Holyoke	–	–	1		1	1	–	–	–	–	1	1	–	–	–	–

*Deaths not available by communities.

Meningitis, Undetermined — Continued

	1942		1943*		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Hopedale	–	–	–		–	–	–	–	–	–	1	–	–	–	–	–
Lawrence	–	–	2		3	1	1	1	–	1	–	–	–	–	1	1
Lenox	–	–	–		–	–	1	–	–	–	–	–	–	–	–	–
Leominster	–	–	1		1	–	–	–	–	–	1	–	6	–	–	–
Lexington	–	–	–		1	–	–	–	–	–	–	–	1	–	–	–
Longmeadow	–	–	–		–	–	–	–	–	–	–	–	–	–	1	–
Lowell	–	–	2		2	–	–	2	1	–	1	–	–	–	1	–
Ludlow	–	–	–		1	1	–	–	–	–	–	–	–	–	–	1
Lynn	–	–	1		2	–	1	–	–	–	–	1	–	1	–	–
Malden	–	–	1		1	–	–	1	–	2	–	–	1	1	–	–
Marblehead	–	–	1		–	–	–	–	1	–	–	–	–	–	–	–
Marlboro	–	–	1		–	1	–	–	–	–	–	–	–	–	–	–
Medford	1	–	1		1	–	–	–	2	–	–	–	–	–	1	1
Melrose	1	–	2		–	–	–	–	–	–	–	–	1	–	–	–
Methuen	–	–	–		2	2	–	–	–	–	–	–	–	–	–	–
Middleboro	–	–	–		–	–	–	–	–	–	1	–	–	–	–	–
Milford	–	–	–		2	–	–	–	–	–	–	–	–	–	–	–
Military Est.	–	–	4		–	–	–	–	2	–	–	–	–	–	–	–
Millbury	–	–	–		1	–	–	–	1	1	–	–	–	–	–	–
Milton	–	–	2		–	–	–	–	–	–	–	–	1	1	–	–
Monson	–	–	–		–	–	1	–	–	–	–	–	–	–	–	–
Montague	–	–	–		–	–	–	–	–	–	–	1	–	–	–	–
Nantucket	–	–	–		–	–	–	–	1	–	–	–	–	–	–	–
Needham	1	–	–		1	–	–	–	–	–	–	–	–	–	1	–
New Bedford	–	–	–		2	2	–	2	–	–	–	–	–	–	–	–
Newburyport	–	–	1		–	–	–	–	–	–	–	–	–	1	–	–
Newton	–	–	3		3	–	–	–	1	–	2	–	1	–	–	–
Norfolk	–	–	1		–	–	–	–	–	–	–	–	–	–	–	–
North Adams	1	–	–		–	–	–	1	2	–	–	–	1	–	–	–
Northampton	–	–	–		–	–	–	–	–	–	–	–	1	–	–	–
North Attleboro	–	–	–		–	–	–	1	–	–	1	–	1	–	–	–
Northbridge	–	–	1		–	1	–	–	–	–	–	–	–	–	–	–
Norton	–	–	–		–	1	–	–	–	–	–	–	–	–	–	–
Northampton	–	–	–		–	–	–	–	1	–	1	1	–	–	–	–
Norwood	–	–	–		–	–	–	–	–	2	1	–	–	–	–	–
Palmer	–	–	1		–	–	–	–	–	–	–	–	–	–	–	1
Paxton	–	–	–		1	–	–	–	–	–	–	–	–	–	–	–
Peabody	1	–	–		–	–	–	–	–	–	–	–	–	–	–	–
Pembroke	–	–	–		–	–	–	–	–	–	–	–	–	–	1	–
Pittsfield	–	–	–		–	–	–	–	–	–	3	1	1	–	–	–
Plainfield	–	–	–		–	–	–	–	–	–	–	–	1	–	1	–
Plainville	–	–	–		–	–	–	–	–	–	–	–	–	–	–	1
Plymouth	–	–	–		1	–	–	1	–	–	–	–	–	–	–	–
Quincy	1	–	7		9	–	1	1	1	–	1	–	1	–	–	–
Randolph	–	–	–		–	–	–	–	–	–	–	–	1	–	1	–
Rehoboth	–	–	–		1	–	–	–	–	–	–	–	–	–	–	–
Revere	–	–	–		–	–	–	1	1	–	–	–	1	–	–	–
Rockport	–	–	1		–	–	–	–	–	–	–	–	–	–	–	–
Rowley	–	–	–		–	–	–	–	–	1	–	–	–	–	–	–
Salem	–	–	–		1	–	–	–	1	–	–	–	–	–	2	–
Salisbury	–	–	–		–	–	–	–	–	–	1	–	–	–	–	–
Saugus	–	–	–		–	–	–	–	1	–	–	–	–	–	–	–
Scituate	–	–	–		–	–	–	1	–	–	–	–	–	–	–	–
Sheffield	–	–	–		–	–	–	–	–	–	1	–	–	–	–	–
Shirley	–	–	–		–	–	–	–	–	–	–	–	–	–	–	1
Shrewsbury	–	–	1		–	–	–	–	1	–	–	–	–	–	–	–
Somerville	–	–	1		2	–	1	1	–	–	–	1	–	–	–	–
South Hadley	–	–	–		–	–	–	–	–	–	–	–	–	–	1	–
Southbridge	–	–	1		2	1	1	–	–	–	–	–	–	–	–	1
Spencer	–	–	–		1	–	–	–	–	–	–	–	–	–	1	–
Springfield	–	–	7		9	–	7	2	1	–	4	3	3	–	–	–
Sterling	–	–	–		–	–	–	–	–	–	1	1	–	–	–	–
Stockbridge	–	–	–		–	–	–	–	–	–	–	–	–	–	1	–
Stoughton	–	–	1		–	–	–	–	–	–	–	–	1	–	–	–
Swampscott	–	–	1		–	–	–	–	–	–	–	–	–	1	–	–
Taunton	–	–	–		–	–	–	1	1	–	1	1	–	–	1	1
Templeton	–	–	–		–	–	–	–	–	–	–	–	2	–	–	–
Uxbridge	–	–	–		–	–	–	–	1	1	–	–	–	–	–	–
Wakefield	–	–	–		–	–	–	–	–	–	1	–	–	1	1	–
Waltham	–	–	2		–	–	–	1	–	–	1	–	1	–	–	–
Ware	–	–	–		–	–	–	–	–	–	1	–	–	–	–	–
Wareham	–	–	1		–	–	–	–	–	1	1	–	–	–	–	–
Watertown	–	–	–		1	–	–	–	–	–	1	–	1	–	–	–
Webster	–	–	1		–	–	–	–	1	–	–	–	–	–	–	–
Wellesley	–	–	1		–	–	–	–	–	–	–	–	–	–	–	–
West Boylston	–	–	–		–	–	–	–	–	–	–	–	1	–	–	–
West Bridgewater	–	–	–		–	–	–	–	–	1	–	–	–	–	–	–
West Springfield	–	–	–		1	–	–	–	–	–	–	–	–	–	–	–
Westboro	–	–	–		–	–	1	–	–	–	–	–	–	–	–	–
Westfield	1	–	–		3	–	–	–	2	–	–	–	–	–	1	–
Westwood	–	–	–		–	–	–	–	–	–	–	–	1	–	–	–

*Deaths not available.

Meningitis, Undetermined — Continued

	1942		1943*		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Weymouth	–	–	1		1	–	–	2	1	–	–	–	1	–	–	1
Williamstown	–	–	1		–	–	–	–	–	–	1	–	1	–	–	–
Winchendon	–	–	–		–	–	–	–	–	–	–	–	1	–	–	–
Winthrop	–	–	–		–	–	–	1	–	–	–	–	–	–	–	–
Woburn	–	–	2		–	–	–	–	–	–	–	–	–	–	–	–
Worcester	–	–	10		10	1	2	–	3	2	7	–	5	–	2	2
Wrentham	–	–	1		2	–	–	–	–	–	2	–	–	–	–	–
Total	10	–	130	46	108	24	41	36	44	25	57	26	58	18	43	19

*Deaths not available.

Rocky Mountain Spotted Fever

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Barnstable	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Chatham	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–
Dennis	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–
Oak Bluffs	–	–	–	–	1	–	1	1	–	–	–	–	–	–	–	–
Worcester	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Total	–	–	–	–	2	–	1	1	1	–	3	–	–	–	1	–

Salmonellosis

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Adams	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Amesbury	–	–	–	–	–	–	1	–	–	–	–	–	–	–	2	–
Amherst	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Andover	1	–	1	–	–	–	–	–	–	–	1	–	–	–	2	–
Arlington	1	–	–	–	1	–	2	–	–	–	1	–	–	–	–	–
Athol	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Attleboro	–	–	–	–	5	–	–	–	–	–	2	–	1	–	–	–
Auburn	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–
Ayer	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Barnstable	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Becket	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Bedford	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Belmont	–	–	–	–	–	–	–	–	3	–	4	–	–	–	–	–
Bernardston	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Beverly	1	–	4	–	2	–	3	–	3	–	5	–	6	–	–	–
Billerica	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Boston	19	–	7	–	7	–	17	–	10	–	21	–	4	–	21	1
Boylston	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–
Braintree	–	–	2	–	–	–	–	–	–	–	–	–	–	–	1	–
Brewster	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Bridgewater	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Brockton	1	–	1	–	–	–	–	–	5	–	–	–	4	–	–	–
Brookline	–	–	2	–	1	–	1	–	–	–	–	–	1	–	68	–
Cambridge	3	–	8	–	4	–	8	–	10	–	8	–	1	–	2	–
Canton	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Chatham	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Chelsea	–	–	1	–	–	–	–	–	6	–	3	–	1	–	–	–
Chicopee	–	–	2	–	–	–	–	–	–	–	1	–	–	–	–	–
Dalton	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Danvers	–	–	34	1	–	–	2	–	–	–	–	–	–	–	–	–
Dartmouth	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Dedham	–	–	–	–	1	–	1	1	–	–	–	–	–	–	–	–
East Bridgewater	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Erving	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
Everett	1	–	2	–	2	–	–	–	1	–	–	–	–	–	2	–
Fall River	–	–	1	–	–	–	–	–	–	–	–	–	–	–	2	–
Falmouth	–	–	–	–	–	–	1	–	1	–	–	–	1	–	–	–
Fitchburg	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Framingham	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Gardner	4	–	–	–	1	–	–	–	–	–	2	–	–	–	–	–
Gloucester	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Grafton	–	–	1	1	–	–	–	–	–	–	1	–	–	–	–	–
Granby	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–
Greenfield	2	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Hatfield	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–
Haverhill	–	–	14	–	–	–	2	–	7	–	1	–	1	–	3	–
Hingham	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Holden	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–

Salmonellosis — Continued

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Holyoke	–	–	1	–	–	–	–	–	2	–	6	–	2	–	1	1
Hopedale	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Hull	1	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Ipswich	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
Lawrence	3	–	4	–	6	–	3	–	5	–	4	–	1	1	1	–
Leominster	1	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–
Lexington	–	–	1	–	–	–	–	–	1	–	–	–	–	–	2	–
Lowell	3	–	2	–	–	–	1	–	3	–	6	–	2	–	4	–
Ludlow	2	–	–	–	1	–	1	–	–	–	1	–	–	–	–	–
Lynn	–	–	2	–	3	1	2	1	32	–	4	–	1	–	–	–
Malden	2	–	–	–	7	–	8	–	6	–	1	–	4	–	2	–
Manchester	–	–	–	–	5	–	–	–	–	–	–	–	–	–	–	–
Mansfield	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Marblehead	–	–	5	–	1	–	6	–	5	–	1	–	–	–	1	–
Marshfield	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Medford	1	–	2	–	4	–	–	–	–	–	3	–	4	–	–	–
Melrose	3	–	1	–	5	–	1	–	4	–	3	–	1	–	–	–
Methuen	1	–	1	–	1	–	1	–	3	–	–	–	2	–	–	–
Millbury	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Milton	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Montague	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Monterey	–	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–
Natick	–	–	1	–	–	–	3	–	–	–	1	–	2	–	–	–
Needham	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
New Bedford	–	–	–	–	–	–	–	–	–	–	3	–	1	–	1	–
Newburyport	–	–	–	–	1	–	–	–	1	–	1	–	–	–	–	–
Newton	2	–	–	–	13	–	4	–	8	–	2	–	1	–	1	–
Norfolk	–	–	–	–	–	–	–	–	–	–	–	–	6	–	–	–
North Adams	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
North Andover	–	–	1	–	4	–	1	–	–	–	–	–	–	–	–	–
Northampton	–	–	–	–	–	–	3	–	2	–	–	–	–	–	–	–
Northfield	–	–	6	–	–	–	–	–	5	–	–	–	–	–	–	–
Norton	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Norwood	1	–	1	–	–	–	–	–	–	–	1	–	–	–	1	–
Otis	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Palmer	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Peabody	–	–	3	–	–	–	–	–	3	–	3	–	1	–	1	–
Pittsfield	–	–	2	–	1	–	–	–	–	–	–	–	–	–	–	–
Plymouth	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Quincy	12	1	–	–	–	–	36	–	2	–	2	–	–	–	–	–
Reading	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Rehoboth	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Revere	–	–	–	–	1	–	3	–	2	–	2	–	–	–	–	–
Salem	6	–	10	–	4	–	4	–	6	–	6	–	3	–	2	–
Salisbury	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Sandwich	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Saugus	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–
Sheffield	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–
Somerville	5	–	2	–	2	–	–	–	–	–	3	–	3	–	1	–
South Hadley	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Southampton	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Southbridge	1	–	–	–	1	–	–	–	–	–	2	–	–	–	–	–
Southwick	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Spencer	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Springfield	1	–	–	–	3	–	–	–	3	–	1	–	–	–	–	–
Stoneham	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–
Sutton	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Swampscott	–	–	–	–	–	–	–	–	6	–	1	–	–	–	–	–
Taunton	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Templeton	–	–	11	–	–	–	–	–	1	–	1	–	–	–	–	–
Topsfield	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Tyringham	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Uxbridge	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Wakefield	–	–	2	–	–	–	1	–	–	–	–	–	2	–	–	–
Walpole	1	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
Waltham	4	–	1	–	2	–	–	–	1	–	4	–	–	–	1	–
Ware	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Watertown	2	–	–	–	1	–	–	–	1	–	2	–	–	–	–	–
Wellesley	1	–	2	–	6	–	1	–	1	–	2	–	–	–	2	–
West Boylston	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
West Bridgewater	–	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–
West Stockbridge	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Westboro	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Westminster	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
Weymouth	–	–	1	–	–	–	1	–	–	–	1	–	–	–	–	–
Winchendon	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
Winchester	2	–	2	–	–	–	–	–	1	–	2	–	1	–	–	–
Winthrop	–	–	–	–	–	–	–	–	9	–	–	–	2	–	–	–
Woburn	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Worcester	2	–	4	–	11	–	–	–	5	–	15	1	8	1	1	–
Yarmouth	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Total	109	2	158	2	120	1	124	2	180	1	156	2	72	2	130	2

Septic Sore Throat

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Acton	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Acushnet	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
Adams	–	–	–	–	–	–	–	1	–	–	–	–	–	–	1	–
Amesbury	2	–	3	–	5	–	3	–	26	–	5	–	–	–	–	–
Amherst	–	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Arlington	2	–	–	–	2	–	1	–	2	–	–	–	–	–	1	–
Athol	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Attleboro	4	–	2	–	–	–	8	–	1	–	–	–	1	–	–	–
Avon	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
Barnstable	1	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Barre	4	1	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Bedford	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Belmont	2	–	–	–	2	–	–	–	1	–	1	–	–	–	–	–
Beverly	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Billerica	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–
Boston	46	2	77	1	87	2	96	–	74	–	53	–	48	1	50	–
Bourne	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–
Braintree	1	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
Bridgewater	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Brockton	4	1	2	–	–	–	1	1	1	–	1	–	1	–	–	–
Brookfield	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Brookline	2	–	–	–	–	1	1	–	2	–	–	–	1	–	–	–
Burlington	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Cambridge	16	–	10	1	2	–	7	–	3	–	1	–	2	–	2	–
Canton	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Carver	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Chelmsford	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Chelsea	–	1	–	–	–	–	–	–	–	–	–	–	1	1	–	–
Chicopee	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Clinton	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–
Colrain	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Dartmouth	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Dedham	2	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–
Easthampton	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–
Easton	–	–	–	–	1	–	7	–	–	–	–	–	–	–	–	–
East Bridgewater	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Everett	–	–	–	–	1	–	1	1	1	–	1	–	1	–	–	–
Fall River	2	–	–	–	3	–	2	1	1	1	1	–	2	1	1	–
Falmouth	1	–	–	–	–	–	–	1	–	–	–	–	3	–	–	–
Fitchburg	1	1	–	–	–	–	–	1	–	–	–	–	1	–	–	–
Foxboro	–	–	2	–	–	–	–	–	1	–	–	–	–	–	–	–
Framingham	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Freetown	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Gardner	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Georgetown	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Gloucester	1	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
Grafton	–	–	–	–	–	–	–	–	–	–	4	–	–	–	–	–
Greenfield	3	–	–	–	1	–	1	–	3	–	4	–	2	–	–	–
Groton	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Hanover	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Haverhill	–	–	3	–	6	1	4	–	5	2	5	–	–	–	–	–
Hingham	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
Holbrook	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–
Holliston	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Holyoke	–	1	–	–	3	–	–	–	–	–	2	–	–	–	–	–
Hudson	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Hull	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1
Ipswich	3	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–
Lancaster	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Lawrence	–	–	2	2	1	–	–	–	1	–	–	–	–	–	–	–
Leominster	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Lowell	1	1	–	–	2	–	1	–	–	1	–	–	–	–	1	1
Ludlow	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Lynn	1	–	1	–	3	–	10	–	1	–	1	–	1	–	8	–
Malden	3	–	2	–	1	–	–	1	–	–	1	1	–	–	–	–
Mansfield	–	–	–	–	2	–	–	–	2	–	–	–	1	–	–	–
Marion	–	–	7	–	4	–	1	–	–	–	–	–	–	–	–	–
Marlboro	1	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Maynard	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
Medford	7	–	3	1	2	1	3	–	3	–	4	1	6	–	3	–
Melrose	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Merrimac	3	–	3	–	11	–	20	–	16	–	10	–	1	–	–	–
Methuen	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Millbury	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Military Est.	1	–	1	–	10	–	2	–	–	–	–	–	–	–	–	–
Milton	1	1	3	–	–	–	1	–	–	–	1	–	2	–	–	–
Montague	–	–	–	1	–	–	–	–	–	–	1	–	–	–	–	–
Natick	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–
New Bedford	–	–	7	–	–	–	1	1	–	–	–	–	–	–	–	–
Newburyport	4	1	–	–	–	–	–	–	2	–	1	1	–	1	1	–
Newton	4	–	2	1	4	–	2	–	3	–	1	1	1	–	–	–
Norfolk	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–

Septic Sore Throat — Continued

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
North Adams	–	–	–	–	2	–	1	2	2	–	–	–	1	–	–	–
North Brookfield	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
Northampton	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Northbridge	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Norwood	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–
Orleans	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
Orange	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Pittsfield	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–
Quincy	4	1	–	–	3	–	3	–	2	–	2	1	–	–	1	–
Randolph	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Reading	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Revere	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
Rockland	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
Rutland	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Salem	1	–	–	–	–	–	1	–	2	–	1	–	–	–	–	–
Salisbury	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Scituate	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Sharon	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Somerville	–	1	1	–	–	–	3	–	3	–	–	1	–	–	–	–
Springfield	–	–	1	3	–	1	–	1	1	2	–	1	–	–	–	–
Stoneham	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Sutton	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Swampscott	–	–	3	1	–	–	–	–	–	–	–	–	–	–	1	–
Taunton	–	–	–	–	–	–	–	1	–	–	1	–	–	–	1	–
Templeton	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Tewksbury	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Topsfield	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–
Upton	1	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–
Uxbridge	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Wakefield	–	–	6	–	–	–	–	–	–	–	–	–	–	–	–	–
Waltham	5	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–
Warren	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Watertown	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	1
Webster	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–
West Newbury	–	–	–	–	1	–	1	–	–	–	2	–	1	–	–	1
West Springfield	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Westford	1	–	1	–	–	–	–	–	4	–	–	–	–	–	3	–
Weston	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Weymouth	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–	–
Whitman	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Williamstown	1	–	3	–	4	–	10	–	10	–	–	–	–	–	–	–
Winchendon	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Winchester	5	–	3	–	4	–	–	–	–	–	–	–	–	–	–	–
Winthrop	2	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Worcester	6	–	2	–	2	–	2	–	–	–	–	–	–	–	12	–
Total	171	18	160	15	188	8	200	15	179	9	113	7	85	6	96	6

Tetanus

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Acton	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Ashburnham	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Attleboro	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Beverly	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–
Billerica	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–
Blackstone	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–
Boston	1	–	1	–	2	1	2	–	–	–	1	–	–	–	–	–
Boxboro	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–
Bridgewater	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Brockton	–	–	2	1	–	–	–	–	–	–	1	–	–	–	–	–
Brookline	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Burlington	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–
Cambridge	–	–	–	–	–	–	1	1	–	–	–	–	1	1	–	–
Chelsea	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–
Chicopee	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Dartmouth	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Deerfield	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Duxbury	–	–	–	–	–	–	–	–	1	1	–	–	–	–	1	–
East Bridgewater	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Fall River	1	1	1	–	–	–	–	–	2	–	–	–	–	–	–	–
Falmouth	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–
Framingham	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Gloucester	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Grafton	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–

Tetanus — Continued

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Great Barrington	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Hanover	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Haverhill	1	1	1	1	–	–	–	–	–	–	–	–	–	–	–	–
Holyoke	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Hopkinton	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Kingston	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Lawrence	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–
Lexington	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Lowell	–	–	1	1	–	–	1	–	–	–	–	–	–	–	–	–
Lynn	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–
Malden	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Medford	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–
Medway	–	–	–	–	2	1	–	–	–	–	–	–	–	–	–	–
Methuen	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Milford	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Natick	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
New Bedford	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–
Newbury	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
Newton	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Norfolk	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
North Attleboro	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
North Reading	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Northbridge	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–
Oakham	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Orange	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–
Peabody	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Pittsfield	–	–	–	–	1	–	–	–	3	–	1	–	1	–	1	–
Plymouth	1	1	–	–	–	–	1	1	–	–	–	–	–	–	–	–
Quincy	–	–	–	–	2	1	–	–	2	–	–	–	–	–	1	–
Raynham	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Rockport	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Shrewsbury	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Somerville	–	–	–	1	–	–	–	–	–	–	–	–	1	–	–	–
Southwick	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
Springfield	2	–	1	–	1	1	–	–	–	–	1	1	–	–	–	–
Taunton	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Wakefield	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Wareham	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
West Springfield	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Weymouth	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Whitman	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Worcester	–	–	–	–	–	–	1	–	–	–	–	–	2	1	–	–
Total	11	4	14	8	18	8	12	4	13	3	10	1	9	2	11	–

Trachoma

	1942	1943	1944	1945	1946	1947	1948	1949
	C	C	C	C	C	C	C	C
Acton	1	–	–	–	–	–	–	–
Arlington	–	–	1	–	–	–	–	–
Beverly	–	–	1	–	–	–	–	–
Boston	3	7	2	–	–	3	–	1
Brookline	–	–	–	–	–	1	–	–
Cambridge	1	–	1	–	–	–	–	1
Chicopee	–	–	–	–	1	–	–	–
Cummington	–	–	–	–	–	1	–	–
Fall River	–	1	–	–	–	–	1	–
Foxboro	–	–	–	–	–	–	–	3
Hudson	–	1	–	–	–	–	–	–
Lee	–	–	1	–	–	–	–	–
Lynn	–	–	–	–	–	–	1	–
Malden	–	–	–	–	–	–	1	–
Medford	–	1	–	–	–	–	–	–
Medway	–	1	–	–	–	–	–	–
Milton	–	–	–	–	–	1	–	–
Norwood	1	–	–	–	–	–	–	–
Quincy	1	1	–	–	–	–	–	–
Salem	–	–	–	1	–	–	–	–
Wakefield	–	–	–	–	–	1	–	–
Watertown	–	–	1	–	–	–	–	–
West Boylston	1	–	–	–	–	–	–	–
West Tisbury	–	–	1	–	–	–	–	–
Weymouth	–	1	–	–	–	–	–	–
Whitman	–	–	–	–	–	–	–	1
Worcester	1	–	–	–	–	1	1	–
Total	9	13	8	1	2	7	4	6

Trichinosis

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Adams	–	–	–	–	–	–	–	–	4	–	1	–	–	–	–	–
Amherst	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Andover	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–
Arlington	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Attleboro	–	–	1	–	–	–	–	–	–	–	2	–	–	–	–	–
Becket	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Belchertown	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Boston	4	–	7	–	12	–	13	–	14	–	19	1	4	–	9	–
Bridgewater	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Brockton	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Brookline	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Cambridge	1	–	–	–	–	–	1	–	3	–	4	–	4	–	6	–
Chelsea	–	–	–	–	3	–	1	–	–	–	–	–	–	–	–	–
Chesterfield	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Concord	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–
Danvers	–	–	–	–	–	–	–	–	1	–	–	–	2	–	–	–
Dighton	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Douglas	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Dover	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Everett	2	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Fall River	–	–	–	–	–	–	1	–	1	–	4	–	11	–	1	–
Falmouth	–	–	–	–	1	–	1	–	1	–	1	–	–	–	–	–
Fitchburg	–	–	–	–	–	–	–	–	–	–	3	–	–	–	1	–
Framingham	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Gloucester	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–
Hadley	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Hancock	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Hanover	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–
Haverhill	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Hingham	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Lakeville	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Lawrence	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–
Lenox	–	–	–	–	–	–	–	–	–	–	4	–	–	–	–	–
Lexington	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Lowell	–	–	–	–	2	–	–	–	–	–	1	–	–	–	–	–
Malden	1	–	–	–	–	–	–	–	1	–	1	–	2	–	2	–
Mansfield	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–
Marblehead	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Medford	–	–	–	–	1	–	–	–	2	–	–	–	1	–	–	–
Melrose	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Methuen	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Middleboro	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
Millbury	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Military Est.	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natick	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
New Bedford	1	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–
Newton	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Northampton	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Norton	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Norwood	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–
Pembroke	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Pittsfield	–	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–
Plymouth	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–
Quincy	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–
Salem	–	–	–	–	–	–	–	–	–	–	1	–	1	–	1	–
Shirley	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Somerville	–	–	–	–	–	–	1	–	1	–	–	–	1	–	–	–
Springfield	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Stoneham	1	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
Sutton	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
Swansea	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–
Taunton	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Wakefield	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Walpole	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Waltham	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–
Watertown	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Wellesley	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–
Wenham	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
West Stockbridge	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–
Westport	–	–	–	–	–	–	–	–	2	–	1	–	–	–	–	–
Westwood	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–
Williamstown	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Winchendon	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Worcester	–	–	–	–	–	–	1	–	2	–	–	–	–	–	3	–
Total	19	–	13	–	31	–	28	–	38	–	59	1	42	–	32	1

Tuberculosis, Other Forms

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Abington	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1
Acton	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Adams	–	1	–	–	1	1	–	–	–	–	–	–	1	–	–	–
Agawam	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
Amesbury	1	–	–	1	–	–	1	1	–	1	–	1	–	1	–	1
Amherst	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
Andover	–	–	1	–	–	–	–	–	1	–	–	–	1	–	–	–
Arlington	2	–	–	–	–	1	4	–	1	1	–	–	2	–	2	–
Ashburnham	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
Athol	1	–	–	1	–	–	–	1	–	–	–	–	1	–	–	–
Attleboro	2	–	1	–	–	–	–	–	1	–	–	–	2	–	1	1
Auburn	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Avon	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	–
Ayer	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Barnstable	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–
Barre	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Becket	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–
Bedford	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Belchertown	1	–	–	–	–	–	–	–	–	–	–	–	2	–	1	–
Belmont	1	1	2	3	–	–	–	–	3	–	–	–	1	2	1	–
Beverly	–	–	4	–	1	–	–	–	1	–	–	2	1	1	1	1
Boston	48	28	56	21	52	24	41	22	64	28	66	23	45	23	45	17
Bourne	–	–	–	1	–	–	–	–	–	–	1	–	–	–	–	–
Braintree	–	1	–	–	–	1	1	1	–	–	2	–	1	–	1	–
Bridgewater	–	–	–	–	2	1	1	–	1	–	–	–	–	–	–	–
Brockton	2	2	2	1	3	–	2	2	2	–	3	2	1	2	4	–
Brookline	–	1	2	1	2	–	1	–	–	–	–	–	–	1	1	2
Burlington	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
Cambridge	17	5	9	4	12	3	6	–	8	1	13	2	5	1	3	1
Canton	–	–	–	1	–	–	–	–	1	–	–	–	–	–	–	–
Chelmsford	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–
Chelsea	4	–	3	–	2	2	2	–	1	2	2	3	–	–	–	–
Chicopee	–	1	–	–	1	–	–	1	4	3	2	1	2	–	–	2
Clinton	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Concord	–	–	–	–	1	1	–	–	–	1	2	–	–	–	–	–
Dalton	–	1	–	–	–	1	–	–	–	–	–	1	–	–	–	–
Danvers	–	–	–	–	1	2	–	–	–	1	–	1	2	1	–	–
Dartmouth	1	–	–	–	–	–	1	–	1	–	1	–	–	–	–	–
Dedham	–	–	1	2	–	–	–	–	–	1	1	1	3	2	–	–
Deerfield	1	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
Dennis	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–
Dighton	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–
Douglas	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
Dracut	–	1	–	–	–	–	–	–	1	–	–	–	–	–	–	–
East Bridgewater	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
East Longmeadow	–	–	1	1	–	–	–	–	–	–	–	–	–	–	–	1
Eastham	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Easton	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Everett	–	3	5	1	4	1	5	2	1	–	–	1	1	–	1	1
Fairhaven	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–
Fall River	4	2	3	–	5	2	11	4	4	4	12	3	11	4	12	7
Falmouth	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Fitchburg	4	–	2	1	–	4	1	1	1	1	3	1	1	1	1	–
Foxboro	1	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–
Framingham	2	1	–	–	2	1	3	1	–	–	1	–	2	–	2	1
Franklin	–	–	–	1	–	–	–	–	–	–	–	–	1	–	–	–
Gardner	1	–	–	1	–	–	1	1	1	–	1	–	–	–	1	–
Gloucester	2	2	–	–	5	–	1	–	1	–	–	1	–	–	1	–
Great Barrington	–	–	1	–	–	–	–	–	–	–	–	1	–	–	–	–
Greenfield	–	2	1	–	–	–	1	1	–	–	–	–	–	–	1	–
Groton	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Hadley	–	–	–	–	–	–	–	–	–	–	–	–	2	1	–	–
Hanover	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–
Harwich	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Hatfield	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
Haverhill	1	–	3	1	2	–	1	1	5	2	1	3	3	–	3	1
Hingham	–	1	–	–	–	–	1	1	–	1	1	–	–	–	–	–
Holbrook	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Holden	–	1	–	–	–	–	–	–	–	–	–	–	1	1	–	–
Holyoke	3	3	3	2	3	2	3	–	7	2	3	–	1	–	–	–
Hopedale	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Hudson	–	–	–	1	–	–	–	–	1	1	–	–	–	–	–	–
Ipswich	–	–	–	–	–	–	1	1	–	–	–	–	–	–	1	–
Lakeville	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
Lawrence	4	2	5	6	2	1	2	2	4	1	5	1	1	2	2	2
Leicester	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Leominster	–	–	1	–	–	–	–	–	–	–	1	2	–	–	–	–
Lenox	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–
Lexington	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Longmeadow	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Lowell	6	–	13	7	4	2	4	–	6	3	3	1	2	1	4	1
Ludlow	–	–	2	1	2	1	–	–	–	–	–	1	–	–	–	–

Tuberculosis, Other Forms — Continued

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Lynn	3	1	7	2	5	2	3	2	4	1	2	2	4	1	2	–
Malden	2	2	6	1	2	1	1	–	7	2	4	–	3	1	–	1
Manchester	–	–	–	1	–	–	–	–	–	–	–	–	1	–	–	–
Mansfield	–	–	1	–	–	–	–	–	–	–	1	1	1	–	2	–
Marblehead	–	–	–	–	1	–	1	1	1	–	–	–	1	–	–	–
Marion	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Marlboro	1	1	1	1	3	1	–	–	–	–	–	1	–	–	–	–
Mattapoisett	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Medford	4	2	6	2	4	3	3	–	6	–	1	1	1	2	1	1
Melrose	1	1	–	–	–	–	–	–	–	1	1	1	2	3	–	–
Merrimac	1	1	–	–	–	–	1	1	–	–	–	–	–	–	–	–
Methuen	–	–	–	–	–	–	–	–	–	1	–	–	1	1	–	–
Middleboro	–	1	–	–	1	1	–	–	–	–	1	–	–	–	–	–
Milford	–	1	–	–	–	–	1	–	–	–	–	–	–	–	1	1
Millbury	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–
Millville	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Military Est.	1	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–
Milton	1	–	–	1	1	–	–	–	–	–	–	–	2	2	1	–
Monson	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Montague	–	1	–	–	–	–	1	1	–	–	–	–	–	–	–	–
Nahant	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Nantucket	–	–	–	–	–	–	–	–	1	–	–	–	1	1	–	–
Natick	–	–	–	–	2	1	–	–	–	1	1	–	1	–	1	–
Needham	1	–	–	2	–	–	2	1	–	–	–	–	–	–	1	–
New Bedford	6	4	6	2	15	3	7	1	4	3	13	–	10	1	2	2
Newburyport	1	–	1	–	–	1	–	–	2	–	–	–	–	1	–	–
Newton	6	1	–	2	3	–	3	2	1	–	2	1	–	–	1	–
Norfolk	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
North Adams	2	1	1	1	2	2	2	2	–	–	–	–	3	1	2	–
North Andover	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
North Attleboro	1	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–
Northampton	1	1	–	–	1	–	1	–	1	–	1	2	–	–	1	–
Northbridge	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Norwood	–	–	–	–	–	1	–	1	–	–	–	–	1	–	–	–
Oak Bluffs	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Orange	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Palmer	–	–	–	–	–	–	1	1	–	–	1	–	1	2	–	–
Peabody	1	1	–	–	1	1	1	–	1	–	1	1	1	–	1	–
Pepperell	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Pittsfield	5	–	1	–	2	1	–	–	2	1	1	1	1	–	1	–
Plymouth	1	3	–	–	–	1	–	–	–	–	–	–	2	2	–	–
Provincetown	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Quincy	4	2	5	2	4	1	4	–	2	–	1	1	5	–	1	–
Randolph	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Reading	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
Revere	2	–	5	–	–	–	–	–	–	–	–	–	–	–	–	–
Rockland	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
Rockport	–	1	–	–	1	–	1	1	–	–	–	–	1	–	–	1
Russell	–	–	–	1	–	–	–	–	–	–	1	–	–	–	–	–
Salem	4	–	3	2	4	–	1	2	1	–	–	2	1	–	1	–
Saugus	–	–	–	1	–	–	–	–	–	1	1	–	1	2	–	–
Scituate	–	–	1	–	–	–	–	–	–	–	2	–	–	–	–	–
Seekonk	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–
Sharon	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Shrewsbury	–	–	–	–	–	–	–	–	–	1	–	–	1	–	–	–
Somerset	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	2
Somerville	7	2	4	1	7	2	10	1	6	–	3	1	–	–	1	3
South Hadley	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1
Southampton	1	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Southbridge	1	–	2	–	–	–	–	–	–	1	1	2	–	–	–	–
Southwick	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–
Spencer	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–
Springfield	5	2	5	4	4	3	3	3	2	2	6	2	5	4	4	2
Stockbridge	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Stoneham	–	–	1	–	–	–	–	–	–	1	–	–	–	–	–	–
Stoughton	–	1	–	2	–	–	–	–	–	–	–	–	1	–	–	–
Swampscott	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–
Swansea	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–
Taunton	1	4	1	3	–	–	2	–	–	–	–	1	–	1	–	1
Tewksbury	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–
Tewksbury State Hospital	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Tisbury	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Townsend	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–
Tyngsboro	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–
Uxbridge	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
Wakefield	1	1	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Walpole	–	–	–	–	3	1	–	–	–	–	–	–	–	–	1	–
Waltham	–	1	6	2	2	–	–	1	–	1	1	–	4	4	1	–
Ware	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–
Wareham	–	–	–	–	–	–	–	1	–	–	1	1	–	–	1	–
Warren	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–
Watertown	1	1	–	1	2	–	1	–	1	–	–	–	–	–	2	–

Tuberculosis, Other Forms — Continued

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Wayland	–	1	–	1	–	–	1	–	–	–	–	–	–	–	–	–
Webster	–	1	–	–	–	–	–	–	1	1	1	1	–	–	–	–
Wellesley	–	–	3	–	–	–	–	–	1	1	–	1	–	–	–	–
West Boylston	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
West Springfield	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–
Westboro	–	–	1	–	–	–	1	1	–	–	–	–	–	–	–	–
Westfield	1	3	1	–	–	–	–	1	–	–	1	–	–	–	–	–
Weston	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–
Westport	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Weymouth	–	–	1	1	1	–	–	–	1	–	–	1	–	1	–	–
Whately	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Whitman		–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Wilmington	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–
Winchendon	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Winchester	–	–	1	2	1	–	–	1	–	–	–	–	1	–	1	–
Winthrop	2	1	–	–	–	–	–	–	1	1	2	1	–	–	1	–
Woburn	2	–	2	–	–	1	–	2	2	2	1	–	–	–	–	–
Worcester	9	5	18	7	6	1	9	5	6	3	3	5	7	2	2	1
Worthington	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Wrentham	–	2	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Total	199	118	221	109	193	84	164	79	179	82	187	89	166	82	138	59

Tularemia

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Boston	–	–	–	–	–	–	–	–	1	–	–	1	–	–	–	–
Bourne	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
Chilmark	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Duxbury	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Falmouth	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
Grafton	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–
Holyoke	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
Lakeville	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Sandwich	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Scituate	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Tisbury	–	–	–	–	–	–	–	–	1	–	–	–	–	–	2	–
Waltham	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Wareham	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Total	–	–	3	–	1	–	–	–	2	–	7	2	1	–	4	–

Typhoid Fever

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Adams	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–
Andover	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Arlington	2	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Attleboro	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Becket	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Bellingham	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Beverly	–	–	–	–	1	–	–	–	–	–	2	1	1	–	–	–
Boston	13	1	3	2	7	–	4	1	5	–	5	1	12	1	3	1
Brockton	–	–	1	–	1	–	–	–	–	–	–	–	1	–	–	–
Brookline	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Brookfield	–	–	1	–	–	1	–	–	–	–	–	–	–	–	–	–
Cambridge	2	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Charlton	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Chelmsford	–	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–
Chelsea	–	–	1	–	1	–	–	–	2	–	–	–	–	–	–	–
Chicopee	–	–	–	–	1	–	4	–	3	1	–	–	–	–	–	–
Clinton	–	–	–	–	–	–	–	–	–	–	4	–	–	–	–	–
Dalton	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Dartmouth	–	–	2	–	–	–	–	–	–	–	–	–	1	–	–	–
Dunstable	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
East Longmeadow	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Easton	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Everett	–	–	1	–	–	–	–	–	–	–	1	–	–	–	2	–

Typhoid Fever — Continued

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Fairhaven	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Fall River	1	–	1	–	1	–	–	–	1	–	2	–	2	–	–	–
Framingham	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Gardner	1	–	1	1	1	–	–	–	–	–	–	–	1	–	–	–
Gloucester	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Grafton	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Haverhill	–	–	2	–	1	–	–	–	–	–	–	–	–	–	1	–
Holyoke	–	–	1	1	1	–	–	–	1	–	–	–	–	–	–	–
Ipswich	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Lawrence	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–
Leominster	–	–	–	–	–	–	–	–	1	–	–	–	–	–	2	1
Lowell	1	–	1	1	–	–	1	–	1	–	–	–	1	–	–	–
Ludlow	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Lynn	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Lynnfield	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Malden	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
Marblehead	–	–	–	–	1	–	–	–	2	–	–	–	–	–	–	–
Medford	1	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
Melrose	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–
Methuen	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Middleboro	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Milton	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natick	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
New Bedford	–	–	1	–	2	–	2	1	–	–	1	–	3	1	–	–
Newton	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–
North Adams	–	–	1	–	–	–	–	–	1	–	1	–	–	–	–	–
North Attleboro	–	–	2	–	1	–	–	–	–	–	–	–	–	–	–	–
Norwood	–	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–
Orange	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Peabody	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
Pittsfield	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Plymouth	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
Quincy	1	–	1	–	1	–	–	–	–	–	1	–	1	–	1	–
Randolph	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Rehoboth	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Rockland	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Salem	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–
Shrewsbury	–	–	1	–	–	–	–	–	–	–	1	–	–	–	–	–
Saugus	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Shirley	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Somerset	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–
Somerville	–	–	–	–	–	–	–	–	3	–	–	–	–	–	2	–
South Hadley	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Springfield	–	–	–	–	1	–	–	–	2	–	–	–	3	–	–	–
Stoughton	1	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
Swansea	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Tewksbury	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
Tewksbury State Infirmary	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4	–
Waltham	1	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–
Warren	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Watertown	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Wellesley	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
West Brookfield	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Westfield	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Winthrop	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–
Woburn	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Worcester	8	–	–	–	1	–	–	–	4	–	–	–	–	–	3	1
Total	50	1	34	5	32	1	18	2	33	2	23	2	33	2	30	3

Typhus Fever

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Arlington	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Boston	–	–	–	–	2	–	–	–	2	–	–	–	–	–	1	1
Chelsea	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Malden	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Military Est.	1	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–
Williamstown	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	2	–	3	–	3	–	–	–	3	–	–	–	–	–	1	1

Undulant Fever

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Acton	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–
Adams	–	–	6	1	–	–	2	–	5	–	1	–	–	–	–	–
Aga am	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Alford	–	–	–	–	–	–	–	–	–	–	–	–	2	1	–	–
Amesbury	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–
Ashburnham	1	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
Ashfield	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Ashland	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Attleboro	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Auburn	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
Avon	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Bedford	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Belchertown	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Belmont	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–
Beverly	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Billerica	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–
Blandford	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Bolton	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Boston	–	–	1	–	7	–	1	–	2	–	3	–	2	–	1	–
Bourne	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Boxboro	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Boxford	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Bridgewater	1	–	–	–	1	–	–	–	1	–	–	–	3	–	1	–
Brimfield	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Brockton	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Brookfield	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Brookline	–	–	1	–	–	–	2	–	–	–	1	–	–	–	–	–
Burlington	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Cambridge	2	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–
Carlisle	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Charlemont	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–
Chatham	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Chelsea	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Chesterfield	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Chicopee	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Clarksburg	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Clinton	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Conway	–	–	1	–	1	1	–	–	–	–	–	–	–	–	–	–
Dalton	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–
Danvers	1	–	–	–	1	–	–	–	–	–	1	–	–	–	1	–
Dartmouth	–	–	2	–	–	–	–	–	–	–	1	–	1	–	1	–
Deerfield	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–
Dighton	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–
Douglas	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Dudley	–	–	–	–	–	–	–	–	–	–	1	–	2	–	–	–
East Bridgewater	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–
East Brookfield	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
East Longmeadow	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Easton	–	–	2	–	–	–	–	–	–	–	–	–	1	–	–	–
Egremont	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Falmouth	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Fitchburg	1	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–
Foxboro	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Framingham	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–
Franklin	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Freetown	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Gardner	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–
Gloucester	2	–	2	–	–	–	2	–	–	–	–	–	1	–	–	–
Grafton	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–
Great Barrington	–	–	1	–	1	–	–	–	–	1	–	–	1	–	1	–
Greenfield	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Groveland	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Hampden	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Hanson	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Hardwick	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Hatfield	–	–	1	–	1	–	1	–	–	–	–	–	–	–	–	–
Haverhill	–	–	–	–	–	–	–	1	1	–	1	–	–	–	–	–
Ha ley	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Hinsdale	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Holbrook	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Holyoke	–	–	–	–	1	–	1	–	–	–	3	–	1	–	–	–
Hopedale	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	–
Hopkinton	–	–	3	–	–	–	–	–	–	–	–	–	2	–	–	–
Ipswich	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Lancaster	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–
Lee	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Lenox	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–
Leominster	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Lexington	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Lincoln	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Lowell	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Ludlow	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–

Undulant Fever — Continued

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Lunenburg	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–
Malden	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Mansfield	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–
Marblehead	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–
Mattapoisett	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Maynard	–	–	–	–	–	–	–	–	1	–	–	–	1	–	2	–
Medford	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Medway	–	–	–	–	1	–	–	–	–	–	–	–	1	–	1	–
Melrose	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–
Merrimac	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Methuen	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Middleboro	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Milford	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Millbury	1	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–
Military Est.	–	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–
Millville	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Nantucket	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Natick	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
New Ashford	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
New Bedford	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
New Marlboro	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Newton	–	–	–	–	–	–	–	–	1	–	1	–	2	–	1	–
Norfolk	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
North Adams	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
North Andover	2	–	–	–	–	–	2	–	1	–	–	–	–	–	–	–
North Brookfield	–	–	2	–	–	–	–	–	–	–	–	–	–	–	–	–
Northampton	–	–	–	–	–	–	4	–	–	–	1	–	–	–	–	–
Northboro	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Northbridge	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Northfield	1	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Norton	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–
Norwood	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Oxford	–	–	–	–	2	–	–	–	1	–	–	–	–	–	–	–
Palmer	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–
Paxton	–	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–
Pembroke	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–
Pepperell	–	–	–	–	–	–	–	–	–	–	–	–	1	–	2	–
Plymouth	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Quincy	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–
Raynham	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Rehoboth	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–
Revere	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–
Rockport	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Rutland	–	–	–	–	2	–	–	–	–	–	1	–	–	–	1	–
Sandwich	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Sangus	–	–	–	–	1	–	–	–	–	–	–	–	–	–	1	–
Sheffield	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–
Shelburne	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–
Somerset	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Somerville	1	–	1	–	1	–	1	–	–	–	–	–	–	–	–	–
Southampton	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Southboro	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Southbridge	1	–	2	–	1	–	2	–	3	1	–	–	–	–	–	–
Southwick	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–
Spencer	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Springfield	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Sudbury	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Swansea	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Taunton	–	–	–	–	–	–	3	–	1	–	–	–	–	–	–	–
Templeton	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–
Tewksbury	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Townsend	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Uxbridge	1	–	1	–	–	–	1	–	1	–	–	–	–	–	–	–
Waltham	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Ware	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Wareham	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Warren	–	–	–	–	–	–	–	–	–	–	2	–	1	–	–	–
Watertown	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Webster	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–
Wellesley	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
West Bridgewater	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
West Brookfield	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
West Springfield	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Westboro	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–
Westfield	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Westminster	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Weston	–	–	–	–	–	–	–	–	–	1	1	–	1	–	–	–
Weymouth	1	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–
Whately	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Whitman	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Wilbraham	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Williamstown	–	–	1	–	1	–	2	–	–	–	–	–	–	–	–	–

Undulant Fever — Continued

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Wilmington	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Winchester	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–
Woburn	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–
Worcester	1	–	–	–	–	–	2	–	2	–	23	–	–	–	–	–
Yarmouth	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–
Total	35	–	43	1	46	1	49	3	52	3	76	–	39	2	31	–

Weils Disease

	1942		1943		1944		1945		1946		1947		1948		1949	
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Boston	1	1	–	–	1	1	–	1	–	–	–	–	–	–	–	–
Gloucester	–	–	1	–	–	–	–		–	–	–	–	–	–	–	–
Medford	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–
Monson	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–
Ware	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–
Watertown	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–
Total	1	1	2	–	2	2	3	1	–	–	–	–	–	–	–	–

DIVISION OF VENEREAL DISEASES
CONSOLIDATED REPORT 1942–1949

Nicholas J. Fiumara, M.D., M.P.H., *Director*

The period between 1942 and 1949 saw the development of the antibiotic era in venereal disease control. These antibiotics revolutionized the treatment of all the venereal diseases, syphilis in particular. This period too was marked with discoveries in the diagnostic field rivaling in importance even the antibiotics. However, before going into the discussion of the utilization of these monumental tools in our venereal disease program, it may be well to review very briefly the highlights of the work of the Venereal Disease Division.

Administration

The Division of Venereal Diseases moved from the State House in 1945 and has since occupied a suite of offices on the second floor of the Ford Building, 15 Ashburton Place, Boston. It has had, and still continues to have, an authorized complement of a Director, Assistant Director, three Public Health Nursing Supervisors, and a stenographic and clerical force of eleven, up to June 1949, when, because of budgetary limitations, the stenographic force was reduced by one. In addition to the three Public Health Nursing Supervisors, the Division also employed a full time epidemiologist up to 1942 when this position was abolished. Throughout this period the Division also saw a succession of Division Directors beginning with Dr. Ernest Howard in 1941 who, on April 20, 1942, received a military leave of absence and entered the Armed Forces. He later resigned his position with the Department. Dr. Howard was followed by Dr. John B. Hozier, Passed Assistant Surgeon, U. S. Public Health Service, who was loaned to the Department. He was followed by Dr. George E. Perkins in 1945 who died on April 3, 1947. On April 7, 1947, Dr. Nicholas J. Fiumara was appointed Director of the Division and remains to the present time.

Budget

In the following table may be seen at a glance the appropriations for the Division:

Table I

Year	State Appropriation	General Federal Funds	Federal R.T.C. Funds	Total
1942	305,108.25	180,000.00		485,108.25
1943	250,397.00	143,100.00		393,497.00
1944	256,038.55	150,000.00		406,038.55
1945	262,881.35	106,366.60		369,247.95
1946	277,290.00	124,861.56	25,918.60	428,070.16
1947	279,690.00	53,560.00	32,537.07	365,787.07
1948	287,730.00	44,165.00	16,920.66	348,815.66
1949	271,197.00	31,160.00	7,486.95	309,843.95

Modus Operandi. The object of the Division is to plan, promote, and carry out a good, sound Venereal Disease Program in accordance with established rules and regulations to the end that Venereal Diseases may be prevented, or if they occur that they may be found and treated. Both of these objectives, prevention and control of venereal disease, imply the promotion of sound social hygiene in the former and facilities for case finding, case holding and case treatment in the latter.

The Division is not alone in carrying out a preventive program for disease. It is a well known fact that sexual promiscuity is the underlying factor in the spread of venereal disease; that if sexual promiscuity is reduced or controlled there will be a corresponding decrease in venereal disease. One of the methods used to discourage promiscuity is to make such illicit relationships illegal and punishable under the law. Thus the fear of legal sanction decreases the extent of promiscuity.

More important than the fear of legal sanction is the education of the individual in the principles of good, sound social hygiene. This is a continuing process beginning in infancy and carried out into adulthood. The education begins in the home and is supplemented by the teachings of the church, schools, physician, communities, youth agencies, law enforcement groups, welfare, social agencies, etc. All of these groups of people by their concerted action can influence the incidence of sexual promiscuity and venereal disease.

In the operation of its control program the Division of Venereal Diseases receives daily the reports of venereal disease from physicians, hospitals and state venereal disease cooperating clinics. The state cooperating venereal disease clinics are twenty-four in number and are used for the diagnosis and treatment primarily of the medically indigent with venereal disease. These clinics are located in the out-patient departments of general hospitals with four exceptions. These four clinics are located in the Board of Health Clinics, because out-patient facilities in that area are lacking. The Department reimburses these hospitals and clinics for the maintenance and operation of these venereal disease clinics in accordance with the high standards set by the Division of Venereal Diseases. Each of these clinics has a chief in charge who is a physician particularly trained in the clinical aspects of venereal disease. Therefore, he assumes the responsibility for the clinical management of all patients in that clinic. He is assisted by one or more physicians in accordance with the size and case-load of the clinic. In addition to the physicians the clinic has a number of clinic nurses. Social service workers are available either on a full time or part time basis, in accordance with the clinic's case-load. There are three clinics in which a social service worker is not employed either on a full time or part time basis. However, these clinics use the social service worker in the District Health Office to perform the social service work requested by the clinic chief.

One of the key individuals in the Cooperating Clinic team is the epidemiologist who interviews all patients for pertinent contacts and brings these latter individuals to the clinic for diagnostic work-up and treatment if infected. However, if the contact prefers to go to a private physician, arrangements are made to furnish this physician with all pertinent data so that he may be on a particular watch for that disease to which the contact was exposed. The epidemiologist, therefore, must be an individual endowed with tact and understanding, an individual who wins the confidence of patients, yet a forceful individual able to impress a patient with the development of good social attitudes, particularly towards sex. The epidemiologist must also be a person with perseverance, ingenuity and initiative capable of ferreting out the locations of contacts of venereal diseases and bringing them back to clinic.

The epidemiologist working from a cooperating clinic covers a specific area and all patients and contacts residing within her area are her responsibility. Thus, the epidemiologist will not only be responsible for the follow-up of people and contacts living in her district and originating from her clinic, but she also does the follow-up of any contact or person living in her district but originating from any other clinic within the state or from out-of-state.

Case Finding. Essential to any good venereal disease control program is the adequate reporting of patients with venereal diseases, because without a knowledge of the number of cases of venereal disease occurring each year and the distribution of these cases, no adequate control measures can be applied. By law physicians in Massachusetts are required to report cases of gonorrhea, syphilis, chancroid, granuloma inguinale and lymphogranuloma venereum. Up to November 3, 1948, these patients were reported only as cases and not by name and address unless:

1. The patient refused to protect his family.
2. The patient had open lesions of syphilis and was engaged as a food handler.
3. The patient failed to report for treatment or follow-up.

In 1949 these regulations were changed so that physicians are now required to report patients with venereal disease by name or initial and other identifying data. Doctors are also required to report by name and address and other identifying information the contacts of such patients. Table II depicts the reported incidence of gonorrhea and syphilis from 1942 to 1949 inclusive (all statistical data in this report will be on a calendar year basis unless otherwise specified). The minor venereal diseases are not shown because as a group they comprise less than 1% of our total venereal diseases.

As seen from table II there was an increase in both gonorrhea and syphilis during the war years and a real decrease did not begin to show itself until 1947, although in

1945 there were less cases of syphilis reported than in 1944, but in 1946 the reported cases of syphilis increased again. From 1947 to the present time there has been a steady decline in these reported cases.

With the increase in total syphilis during the war years there was also an increase in primary and secondary stages of this disease. This increase in infectious syphilis during World War II was also noted during World War I. The reasons for it will be obvious and can be summarized as being due to the dislocation incident to a war and the loss of the restricting influence of the home and family environment. Coincident with these, we may add behavior resulting from war hysteria. All these tend to lower the morals and stamina of individuals resulting in an increased attack rate in venereal disease.

Table III analyzes the reported cases of primary and secondary syphilis by age group and by sex. Throughout this eight year period males were reported more frequently than females and the most sexually active age group (20–30 years) appeared more often than other age groups.

Table IV compares the reported incidence of latent and late syphilis by age and sex with the primary and secondary cases of syphilis. Since the concept of early latent syphilis as one of the potentially common stages of syphilis was not introduced until 1948, for the purpose of this analysis latent syphilis is not subdivided into its early and late latent stages.

It is interesting to note the source of our reported cases of gonorrhea and syphilis. These may be found in tables V and VI. Over the years the State cooperating clinics have reported more than half of the cases of gonorrhea and syphilis. It is obvious from these tables and other sources of information that private physicians are not reporting all their cases of venereal disease, and this statement is made in spite of the fact that there has been a genuine decrease in gonorrhea and syphilis, in the last three years in particular, which can be attributed to the effectiveness of penicillin in controlling the infectious periods of both gonorrhea and syphilis. This problem of incomplete physician reporting of cases is shared in common with other States. To stimulate the reporting of venereal diseases, private physicians have been encouraged to attend the State Cooperating Venereal Disease Clinics in order to obtain the latest methods of diagnosis and treatment. They are also encouraged to send their problem cases to these clinics for consultation. The quarterly issue of the Bulletin of Venereal Diseases is sent to private physicians and medical students in the State. This Bulletin features an original article on some phase of the clinical aspects of the venereal diseases.

Contact Investigation

One of the most fruitful methods of finding a case of infectious syphilis is through contact investigation. It is a well-known epidemiological principle that a patient with venereal disease must contract it from another case with a similar infection. However, in our program we are not satisfied in obtaining the source contact of any infection but we attempt to obtain the spread contact also. In other words, we not only want to know the names and addresses of all those contacts to whom the patient was exposed during the maximum incubation period of the disease but also those whom the patient exposed since the onset of symptoms up to the moment treatment could be expected to be effective. In order to carry out the contact investigation program more effectively standards for contact interviewing and methods of describing a contact were established early in 1949. These standards were published in the medical literature under the titles, "Ten Principles of Venereal Disease Contact Interviewing" and appeared in the Journal of Social Hygiene, October 1949, and "Describing a Contact of Venereal Disease," which was printed in the American Journal of Syphilis, Gonorrhea and other Venereal Diseases, July 1949. These publications remain as the standards for the epidemiologists and were prepared for their guidance in interviewing patients for contacts. Good contact interviewing is the foundation for any successful epidemiological investigation. To illustrate this: in a sample of 677 cases interviewed in 1949 where adequate contact information was obtained 81% of these contacts were found and brought to medical attention. Where inadequate contact information was secured only 44% of these contacts were found. Thus with inadequate contact data, the effectiveness of contact investigation was reduced by almost 50%.

Screen Examination

Case finding by screen examination is one method of discovering new cases of syphilis. The screen examination utilizes a simple, inexpensive laboratory test — the Hinton blood test or similar test — to indicate to the physician the possible presence of syphilis. The blood test per se is not diagnostic of syphilis but a positive blood test in the absence of all other conditions giving rise to an increase in the reagin titre, with or without a past history of this infection, is indicative of this disease. So important is the blood test screen examination, that by law physicians are required to take blood tests for syphilis in the following instances:

1. All persons planning to be married. The premarital blood test law was passed in 1941 and was amended in 1943. At this time the examination for gonorrhea was omitted from the premarital law. The law, therefore, required that the examination be for syphilis only.
2. All pregnant women at the time of their first visit to the clinic or office.
3. All prisoners sentenced to a penal institution for thirty days or more.
4. All prospective blood donors.

At the State Wassermann laboratory approximately 1.8% of blood tests were found to be positive. The State Wassermann laboratory performs approximately one-half million blood tests a year.

To the blood test for syphilis was added in early 1949, the treponemo immobilization test described by Nelson at Johns Hopkins University. For the first time, physicians are able to test for the presence of the syphilis antibody as a measure of present or past infection. Although this test is still in the research stage and not as yet amenable to mass application, its practical potential in the diagnostic field rivals in importance the revolutionary introduction of penicillin to the treatment of syphilis.

War Program

The principles of the screen examination in contact investigation were used quite extensively during the War. By Federal regulation, all persons inducted into the Armed Forces were given a blood test for syphilis as part of their entrance physical examination. Out of the first million men so examined 0.7% were found to be positive, and out of the second million 1.1% were likewise positive. It was the task of the Division to carry out epidemiological investigation on all these cases. It was a monumental task. Similiarly all persons on being separated from the Armed Forces were given a blood test for syphilis as part of their discharge physical examination. Those found to have a positive blood test for syphilis were reported to the State Health Department of the patient's residence. Again the Division carried out medical and epidemiological investigations on these individuals. This work of follow-up of the selectees and separatees with positive blood tests continues on to the present day, although the case load has diminished due to the small number inducted and separated from the services.

The investigation of sexual contacts of infected military personnel was another part of our busy program and continues even to the present day. Table VII summarizes some of our experiences with such types of contact investigation.

Education

Because of our small staff and limited budget, our educational efforts must of necessity be of a selective nature. Education of the patient is paramount and pays good dividends in preventing reinfection; while, at the same time, it brings the message of venereal disease to the patient's environment where other hereunto undetected cases may possibly lurk. Patient education is done at a clinic level and is an essential part of every contact interview.

Professional education is next in our order of priority; to this end, the Bulletin of Venereal Diseases is published quarterly. It features one article on some phase of the clinical management of these patients. It is sent without charge to every physician and medical student in Massachusetts. A concise and brief bulletin of this

nature, in view of the changing drugs and schedules of treatment, is of considerable value to the busy private physician. Lectures have also been arranged for physicians at a District Medical Society level.

A six-hour course on the clinical and public health aspects of gonorrhea and syphilis has been arranged for the nurse training schools in Massachusetts. Each year courses of this nature are given by the central office and field staff to the various training schools in the State.

On a lay level, numerous lectures have been given to PTA groups, religious orders, and student school teachers. In connection with these lectures, an up-to-date film library is maintained. This library contains movies, not only on the clinical aspects of the venereal diseases, but also on the subject of social hygiene. Examples of the latter are the films, "Human Growth" and "Human Reproduction."

Treatment

The period of 1942 to 1949 saw a revolutionary change in the medical treatment of all the venereal diseases. It saw efforts to speed up the treatment of syphilis from one lasting eighteen months to one of six months, three months and even one week duration. With the decrease in the time span of treatment, was an increase in the amount of treatment reactions from the arsenical drugs. This was a calculated risk but the increase in the toxic reactions was overshadowed by the benefits derived. The toxicity of the arsenicals could be dramatically overcome by the injections of BAL. The latter drug was a war-time discovery and was not made available for general use until about 1945. By this time, the importance and use of the arsenicals waned and with it the frequency with which BAL needed to be used. However, in the few cases of arsenical toxicities occurring since 1945 BAL proved to be a boon and frequently a life saver.

As with syphilis, so also with gonorrhea. The sulfonamides when initially introduced, cured more than 90% of all cases of gonorrhea, but as time went on, sulfa-resistant gonococci were seen so that by 1943 in some areas, only about a 25% cure rate was obtained with this drug. Fortunately and timely indeed was the discovery by John Mahoney of the U. S. Public Health Service in 1943, that penicillin would attack the organism of syphilis. It would also cure gonorrhea. Thus was the antibiotic era introduced.

Sulfonamides for the treatment of gonorrhea were therefore abandoned except in certain selected cases where it was desirable not to mask a probable concomitant syphilitic infection. With penicillin approximately a 95–98% cure rate could be achieved. In the meantime refinements in penicillin itself were going on, so that we saw an enhancement of the effectiveness of penicillin with each change. Penicillin in 1943 was a mixture of at least four fractions. When it was found that penicillin G was the most active component, this fraction was purified and crystalized. Crystallin penicillin G is still used today. Crystallin penicillin G was then suspended in oil and wax by Romansky to delay the rate of absorption and prolong the effectiveness of penicillin. Another landmark was therefore reached. Finally penicillin was combined with procaine and then the procaine penicillin was suspended with oil and 2% aluminum monostearate and this combination of penicillin is used at the present time. This preparation will give detectable blood levels of penicillin even for 72 hours with a single injection. Procaine penicillin G in oil with 2% aluminum monostearate is used today.

The repository type of penicillin either with oil and beeswax and later with procaine penicillin in oil with 2% aluminum monostearate made it possible to achieve a 95–98% cure rate for gonorrhea with a single injection of 300,000 units of this drug. This type of penicillin also made it possible to treat syphilis on an ambulatory basis and now effective treatment of this disease can be accomplished in 10 days.

Discovery of penicillin led to search for other antibiotics and soon streptomycin, aureomycin and chloromycetin were described. These three antibiotics were also found to be effective for gonorrhea and syphilis, but could not match the effectiveness of penicillin in the treatment of these diseases. However, they were found to be effective for the treatment of the minor venereal diseases.

Today the sulfonamides remain the drug-of-choice for chancroid. Practically all cases of chancroid will respond to this drug. But, for granuloma inguinale and

lymphogranuloma venereum, chloromycetin and aureomycin in that order of preference constitute our best therapeutic weapons for these two diseases. In some medical and public health circles as the result of the discovery of these antibiotics there prevails the optimistic view that the control of the venereal diseases and particularly syphilis is imminent. If this contention is critically examined, it can be seen that this optimism in respect to the immediate control of these diseases is entirely premature.

It is apparent that syphilis can never be controlled while more than half of the cases are not recognized for more than a year after onset. Although much has been accomplished in venereal disease control during the past years as shown by the declining rates of primary and secondary syphilis, yet, each year we are missing more cases than we recognize. Can venereal disease control be imminent when only approximately one-third of our reported cases of syphilis are discovered as being in the primary and secondary stages? In other words, approximately two-thirds of our reported cases of syphilis are not recognized for more than a year after their onset. Under these conditions syphilis control is not imminent. Much more needs to be done particularly the early recognition of these diseases and the development of new methods of venereal disease control particularly in the low prevalance areas in the United States of which Massachusetts is one.

TABLE II — *Reported Cases of Gonorrhea and Syphilis in Massachusetts 1942–1949*

YEAR	SYPHILIS					GONORRHEA
	Primary	Secondary	Congenital	All Other Syphilis	Total	
1942	429	524	312	4432	5697	4454
1943	477	655	298	4090	5520	4701
1944	511	638	299	3620	5068	4935
1945	684	597	217	2880	4378	5487
1946	1170	748	208	2844	4970	5062
1947	461	500	204	2046	3211	3805
1948	286	334	139	1554	2313	3103
1949	236	175	122	1510	2043	2920

TABLE III — *Reported Cases of Primary and Secondary Syphilis in Massachusetts by Age and Sex 1942–1949*

AGE	1942		1943		1944		1945		1946		1947		1948		1949	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Under 5							3		1							
5 – 9			3		1						1					1
10–14	1	2	1		1	1	2			6	2					
15–19	19	40	47	42	40	56	43	36	52	49	43	48	27	23	15	10
20–24	180	69	170	111	195	113	220	155	530	146	153	113	108	44	78	26
25–29	154	64	152	81	135	109	271	81	388	126	144	74	97	50	60	36
30–34	90	47	83	63	88	59	119	60	222	57	90	51	45	27	41	25
35–39	66	25	65	36	75	44	92	30	112	37	54	21	42	14	17	10
40–44	59	21	69	30	62	19	34	19	37	30	38	19	27	13	26	11
45–49	38	12	31	22	31	12	24	16	35	15	20	12	20	12	7	5
50–54	19	11	33	11	27	15	20	6	27	8	26	7	17	11	5	4
55–59	11	4	20	9	24	5	13	9	7	8	15	5	12	5	11	4
60 and over	10	7	33	9	20	10	16	4	16	1	17	5	19	2	6	1
N. S.	4		6	5	5	2	2	6	4	4	2	1	5		6	6
Total	651	302	710	422	703	446	854	427	1431	487	602	359	419	201	272	139

TABLE IV — *Reported Cases of Latent and Late Syphilis in Massachusetts by Age and Sex*
1942–1949

AGE	1942		1943		1944		1945		1946		1947		1948		1949	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F	M.	F.	M.	F.	M.	F.
Under 5			1									1		1		
5 – 9 .						2										
10–14 .	3			3	2	3	1					1		1	1	1
15–19 .	20	42	59	45	52	53	28	48	39	42	17	51	17	24	16	21
20–24 .	151	157	190	163	165	198	123	170	275	195	135	145	73	98	88	86
25–29 .	243	179	288	179	251	206	195	181	236	171	108	133	78	112	75	83
30–34 .	325	228	346	184	269	183	182	158	195	120	77	101	54	87	50	98
35–39 .	399	195	330	169	267	188	212	147	140	126	92	128	64	73	70	78
40–44 .	511	183	318	168	187	137	154	118	125	114	100	89	75	67	64	51
45–49 .	324	163	290	175	227	128	170	97	150	91	113	70	92	61	75	47
50–54 .	297	171	223	154	215	123	166	95	156	74	105	68	114	61	119	56
55–59 .	246	114	223	110	200	102	146	72	134	84	125	56	94	50	99	47
60 and over	326	134	306	139	305	130	274	121	236	117	229	96	174	79	187	89
N. S. .	11	10	19	8	20	7	11	11	14	10	3	3	2	3	5	4
Total	2856	1576	2593	1497	2160	1460	1662	1218	1700	1144	1104	942	837	717	849	661

TABLE V — *Sources of Reports of Gonorrhea*

Year	Total Cases	PHYSICIANS			CLINICS		INSTITUTIONS		MILITARY	
		Number	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
1942	4454	619	1440	32.3	1179	26.5	142	3.2	1693	38.0
1943	4701	551	1551	33.0	1210	25.7	193	4.1	1747	37.2
1944	4935	612	1679	34.0	1801	36.5	209	4.2	1246	25.3
1945	5487	503	2079	37.9	2078	37.9	187	3.4	1143	20.8
1946	5062	624	1681	33.2	2835	56.0	167	3.3	379	7.5
1947	3805	483	1097	28.8	2256	59.3	119	3.1	333	8.8
1948	3103	366	711	22.9	1727	55.7	104	3.3	561	18.1
1949	2920	268	577	19.7	1635	56.0	75	2.6	633	21.7

TABLE VI — *Sources of Reports of Syphilis*

Year	Total Cases	PHYSICIANS			CLINICS		INSTITUTIONS		MILITARY	
		Number	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
1942	5697	1088	2257	39.6	2455	43.1	618	10.9	367	6.4
1943	5520	977	2266	41.0	2191	39.7	413	7.5	650	11.8
1944	5068	863	1904	37.6	2036	40.2	432	8.5	696	13.7
1945	4378	609	1574	35.9	2076	47.4	357	8.2	371	8.5
1946	4970	769	1492	30.0	3018	60.7	313	6.3	147	3.0
1947	3211	554	1153	35.9	1725	53.7	255	8.0	78	2.4
1948	2313	491	885	38.3	1099	47.5	218	9.4	111	4.8
1949	2043	422	832	40.7	964	47.2	130	6.4	117	5.7

TABLE VII — *Military Contacts Reported to The Massachusetts Department of Public Health 1942–1949*

RESULTS OF INVESTIGATION x FOLLOWED BY

	1942		1943		1944		1945		1946		1947		1948		1949	
Total men interviewed	2201		1630		3310		3936		1479		952		748		629	
Total contacts named	2578		1849		3453		4090		1541		987		789		677	
Total cases closed	2138		2277		3336		3938		1541		987		789		677	
RESULTS OF FOLLOW-UP ON CLOSED CASES																
Cases Not Referred (Insufficient Information)	767	35.9	516	22.7	1368	41.0	1034	26.3	399	25.9	207	21.0	138	17.5	89	13.2
Followed by Nurse	312	14.6	628	27.6	1448	43.4	1439	36.5	501	32.5	365	37.0	337	42.7	399	58.9
Success	271		460		985		1101		366		263		259		313	
Failure	41		168		463		338		135		102		78		86	
Followed by Police	369	17.2	394	17.3	328	9.8	1280	32.5	548	35.6	345	35.0	285	36.1	156	23.0
Success	137		133		100		294		96		70		77		36	
Failure	209		228		217		853		308		228		191		120	
No Reply	23		33		11		133		144		47		17		0	
Followed Out of State	686	32.1	669	29.4	128	3.9	126	3.2	31	2.0	16	1.6	12	1.5	19	2.8
Success	224		187		54		65		13		6		2		9	
Failure	278		226		42		40		9		8		1		5	
No Reply	184		256		32		21		9		2		9		5	
Followed by Boston Health Department	0	0.0	46	2.0	14	0.4	24	0.6	59	3.8	52	5.2	12	1.5	11	1.6
Success	0		18		13		15		32		13		10		7	
Failure	0		22		1		9		27		38		2		4	
No Reply	0		6		0		0		0		1		0		0	
Followed by Other Agencies	4	0.2	24	1.0	50	1.5	35	0.9	3	0.2	2	0.2	5	0.7	3	0.5
Success	1		17		28		23		2		2		3		0	
Failure	2		7		18		10		1		0		1		2	
No Reply	1		0		4		2		0		0		1		1	

DIVISION OF TUBERCULOSIS AND SANATORIA CONSOLIDATED REPORT 1942–1949

Alton S. Pope, M.D., Dr.P.H., *Director*

Massachusetts was one of a group of some six industrial northeastern states which during the war period experienced a flattening out of the curve of tuberculosis mortality. After a steady decline since 1919 the mortality rate in Massachusetts became practically stationary for eight years and in 1943 showed an increase of 12 per cent. The causes of this remission in the presence of a continued decline in other parts of the country are not clear but it may well be due to the extra stress and strain incidental to war time production in an industrial area, an hypothesis supported by the fact that the increase in tuberculosis deaths was entirely in males over 40.

The situation was complicated by a marked reduction in the hospitalization of active cases of tuberculosis. Many patients left the sanatoria to take advantage of wartime wages while others continued to work when they should have been under treatment. Combined with an acute shortage of nursing personnel this resulted in the closing of a quarter to a third of all sanatorium beds in the state. Not until 1948 did the mortality rates resume their previous rate of decline.

Table 1. — *Tuberculosis Deaths and Death Rates Per 100,000 Massachusetts 1941–1949*

Year	Pulmonary		Other Forms		Total	
	Deaths	Rate	Deaths	Rate	Deaths	Rate
1940	1484	34.4	114	2.6	1598	37.0
1941	1520	35.1	112	2.6	1632	37.7
1942	1501	34.6	118	2.7	1619	37.3
1943	1697	39.1	109	2.5	1806	41.6
1944	1606	37.0	84	1.9	1690	38.9
1945	1557	34.5	79	1.8	1636	36.3
1946	1592	35.0	82	1.8	1674	36.8
1947	1495	32.6	89	1.9	1581	34.5
1948	1279	27.2	82	1.8	1361	29.0
1949	1061	22.8	59	1.3	1120	24.1

State Sanatoria

The closing of the tuberculosis wards at the State Infirmary together with the shortage of nursing personnel at the sanatoria resulted in long waiting lists at both state and county sanatoria; a situation only partially relieved by salary increases for nurses in 1948. The only promising solution of the nursing problem in state hospitals appears to be the training of attendant nurses to supplement the graduate nursing in ward care. For this purpose an Interdepartmental Committee on the Training of Licensed Attendants was established in 1949 in cooperation with the Departments of Mental Health, Public Welfare and Education, and training schools for attendants have been opened at Pondville and at Westfield.

Construction at state hospitals was resumed in 1949 with the reconstruction of the power plant and engine room at Pondville. This was followed by a new 100-bed nurses' home at Pondville, started in the fall of 1949. At the same time ground was broken for a superintendent's house and a duplex house for physicians at North Reading.

After the Legislature had authorized the location of the Department's new chronic disease hospital in Boston the City presented to the Department an excellent site of 13.6 acres on Morton Street, Jamaica Plain, readily accessible to the public, the medical schools and the general hospitals of the city. Plans for a modern 600-bed chronic disease hospital on this site are now in preparation.

As soon as it became possible to obtain nurses, in April 1949, a 26-bed unit for children with rheumatic heart disease was opened at the North Reading State Sanatorium, as authorized by Chapter 453, Acts of 1945. The clinical work is under the immediate charge of an assistant superintendent assigned to that service, with a visiting staff from the Metropolitan Boston area.

Under the provisions of Chapter 412 of the Acts of 1948 the Department began the hospitalization of crippled children at Lakeville in April 1949. The orthopedic

staff and facilities of the sanatorium are admirably suited for the treatment of this type of patient and the service provides a much needed supplement to the Department's Crippled Children's Clinics. Approximately 35 children were admitted to this service in 1949.

Chapter 412 of the Acts of 1949 authorized the establishment of a unit of 30 beds for the treatment of children with cerebral palsy at the Lakeville State Sanatorium. The necessary facilities and equipment have been provided, a special staff secured and admissions were begun in December 1949.

County and Municipal Sanatoria

County and municipal sanatoria have in general experienced the same problems and difficulties as the state institutions. Hundreds of beds have been closed on account of inability to obtain nurses. The shortage of staff physicians has been even more acute than in state hospitals. Per capita costs have risen sharply, not only on account of increases in salaries, foods and supplies but also because the sanatoria were obliged to operate far below normal capacity.

New construction has been impossible until the past year. The Essex Sanatorium now has a new 30-bed nurses' home nearing completion and Norfolk County Sanatorium has plans drawn for a new operating suite and an addition of 25 patient beds.

Federal Grants

Beginning July 1, 1945, the Department has received under the provisions of Public Law 410 grants-in-aid for the extension of case finding in tuberculosis. Funds received under these grants have been used in part for the extension and improvement of the Department's case finding program and in part for sub-grants to four municipal health departments, to three county sanatoria and to eight general hospitals for X-ray equipment, films, supplies and personnel for case finding purposes. In the fiscal year 1949 these institutions reported a total of 255,664 chest X-ray examinations. Annual grants have ranged from $240,000 to $350,000.

Arthritis Hospitalization

Since 1938, under the provisions of Section 116A, of Chapter 111, the Department has arranged for the hospitalization and study of a limited number of patients with chronic rheumatism at the Massachusetts General Hospital. Under contract with the hospital approximately 100 patients per year are admitted on this program, and after discharge are followed by their personal physicians or by the outpatient department of the hospital. An impressive amount of research has been carried on in this service and the information gained has been summarized and made available to the medical profession. The average patient's stay is approximately 2½ months. About one-third of all admissions are readmissions.

Field Clinic Program

In the fall of 1943 a mobile photoroentgen unit using 4″ x 5″ films was given to the Department by the Massachusetts Tuberculosis and Health League for the promotion of mass X-ray surveys in industries and in communities of the Commonwealth. This apparatus made possible a rapid expansion of the tuberculosis case finding program in adults with a substantial reduction in the per capita cost. In 1945 two additional 70 mm. mobile X-ray units were purchased with Federal grants and the community survey program was greatly expanded. Results of these surveys, by years, are shown in the following table:

Table 2. — *Breakdown by Year Groups of Number X-rayed*

Year Group	Number X-rayed	Number Pulmonary Tuberculosis	Number Presumably Active	Number Presumably Stable	Suspects	Other Conditions	Cardiac
September 1943 to December 1947	446,623	4964(266)	1427(46)	3537(220)	1287	1849	2938
January 1948 to December 1948	200,087	1955(584)	314(65)	1641(519)	530	581	1705
*January 1949 to December 1949	157,811	1104(370)	181(16)	923(354)	276	741(116)	1305(515)
Totals	804,521	8023(1220)	1922(127)	6101(1093)	2093	3171	5948

() Previously known or reported cases.
* Previously known cases of conditions other than tuberculosis not noted in statistical reports prior to 1949.

A gratifying feature of these mass surveys has been the very effective cooperation of the voluntary tuberculosis associations. They have regularly participated in the preliminary organization in each community surveyed, have taken a major part in the educational program and have mailed out the reports of negative examinations.

LAKEVILLE STATE SANATORIUM

TABLE 1. — *Admissions and Discharges — TUBERCULOSIS*

			Patients Admitted	Patients Discharged	Daily Average Number of Patients	Number of Deaths
1942	Adults	Males	75	74	63.2	8
		Females	59	76	55.8	7
	Children	Males	26	36	45.5	5
		Females	17	31	45.5	–
	Total		177	217	210.0	20
1943	Adults	Males	53	72	53.3	12
		Females	52	50	44.9	6
	Children	Males	18	27	32.4	3
		Females	17	20	31.3	2
	Total		140	169	161.9	23
1944	Adults	Males	39	56	43.0	3
		Females	31	36	45.4	2
	Children	Males	11	15	24.3	–
		Females	13	20	23.7	2
	Total		94	127	136.4	7
1945	Adults	Males	35	36	28.0	8
		Females	34	38	41.0	4
	Children	Males	14	15	20.0	–
		Females	8	11	17.0	–
	Total		91	100	106.0	12
1946	Adults	Males	39	36	35.3	7
		Females	48	47	45.4	4
	Children	Males	18	17	20.4	1
		Females	8	6	15.6	1
	Total		113	106	116.7	13
1947	Adults	Males	40	42	34.5	8
		Females	46	56	43.4	5
	Children	Males	22	20	21.3	3
		Females	17	14	17.5	2
	Total		125	132	116.7	18
1948	Adults	Males	48	40	39.0	3
		Females	64	58	45.1	7
	Children	Males	8	10	18.7	1
		Females	7	11	11.9	–
	Total		127	119	114.7	11
1949	Adults	Males	51	59	40.1	–
		Females	49	65	38.0	4
	Children	Males	16	11	21.1	–
		Females	11	8	12.4	–
	Total		127	143	111.6	4

TABLE 1. — *Admissions and Discharges — POLIOMYELITIS*

			Patients Admitted	Patients Discharged	Daily Average Number of Patients	Number of Deaths
1942	Adults	Males	8	11	6.7	–
		Females	4	5	2.3	–
	Children	Males	21	20	18.0	–
		Females	8	14	9.5	–
	Total		41	50	36.5	–
1943	Adults	Males	5	5	2.6	–
		Females	–	1	.2	–
	Children	Males	14	18	12.4	–
		Females	12	7	6.2	–
	Total		31	31	21.4	–
1944	Adults	Males	3	4	1.9	–
		Females	7	2	2.1	–
	Children	Males	13	11	10.	–
		Females	13	17	7.	–
	Total		36	34	21.	–
1945	Adults	Males	2	3	3.	–
		Females	2	6	4.	–
	Children	Males	16	17	9.	–
		Females	12	6	7.	–
	Total		32	32	23	–
1946	Adults	Males	8	8	3.1	–
		Females	12	10	4.9	1
	Children	Males	10	11	7.6	–
		Female	13	11	11.5	–
	Total		44	40	27.1	1
1947	Adults	Males	5	4	3.3	–
		Females	9	7	5.1	–
	Children	Males	11	12	7.3	–
		Females	10	13	10.9	–
	Total		35	36	26.6	–
1948	Adults	Males	–	4	2.7	–
		Females	8	14	4.9	–
	Children	Males	3	7	3.9	–
		Females	3	10	3.9	1
	Total		14	35	15.4	1
1949	Adults	Males	9	5	1.6	–
		Females	12	6	3.6	–
	Children	Males	22	6	5.5	–
		Females	9	2	1.7	–
	Total		52	19	12.4	–

TABLE 1. — *Admissions and Discharges — CRIPPLED CHILDREN*

			Patients Admitted	Patients Discharged	Daily Average Number of Patients	Number of Deaths
1948	Children	Males	3	–	.5	–
		Females	5	–	.6	–
	Total		8	–	1.1	–
1949	Children	Males	16	12	6.1	–
		Females	19	13	12.6	–
	Total		35	25	18.7	–

TABLE 1. — *Admissions and Discharges — TOTAL OF TUBERCULOSIS, POLIOMYELITIS AND CRIPPLED CHILDREN PATIENTS*

			Patients Admitted	Patients Discharged	Daily Average Number of Patients	Number of Deaths
1942	Adults	Males	83	85	69.9	8
		Females	63	81	58.1	7
	Children	Males	47	56	63.5	5
		Females	25	45	55.0	–
	Total		218	267	246.5	20
1943	Adults	Males	58	77	55.9	12
		Females	52	51	45.1	6
	Children	Males	32	45	44.8	3
		Females	29	27	37.5	2
	Total		171	200	183.3	23
1944	Adults	Males	42	60	44.9	3
		Females	38	38	47.5	2
	Children	Males	24	26	34.3	–
		Females	26	37	30,7	2
	Total		130	161	157.4	7
1945	Adults	Males	37	39	31.	8
		Females	36	44	45.	4
	Children	Males	30	32	29.	–
		Females	20	17	24.	–
	Total		125	132	129.	12
1946	Adults	Males	47	44	38.4	7
		Females	61	57	50.3	5
	Children	Males	28	28	28.	1
		Females	21	17	27.1	1
	Total		157	146	143.8	14
1947	Adults	Males	45	46	37.8	8
		Females	55	63	48.5	5
	Children	Males	33	32	28.6	3
		Females	27	27	28.4	2
	Total		160	168	143.3	18
1948	Adults	Males	48	44	41.7	3
		Females	72	72	50.0	7
	Children	Males	14	17	23.1	1
		Females	15	21	16.4	1
	Total		149	154	131.2	12
1949	Adults	Males	60	64	41.7	–
		Females	61	71	41.6	4
	Children	Males	54	29	32.7	–
		Females	39	23	26.7	–
	Total		214	187	142.7	4

LAKEVILLE STATE SANATORIUM

TABLE 2. — *Diagnosis and Classification on Admission — TUBERCULOSIS PATIENTS (classified by most serious lesion present)*

			Intestines and Peritoneum	Vertebral Column	Other Bones and Joints	Lymphatic System	Genito-Urinary System	Skin and Subcutaneous Cellular Tissue	Other Organs	Non-Tuberculous Disease
1942	Adults	Males	2	7	13	6	13	7	2	1
		Females	9	8	8	17	16	1	10	2
	Children	Males	–	3	9	2	1	2	4	5
		Females	1	2	2	5	1	–	1	5
	Total	. .	10	31	40	18	35	6	17	20
1943	Adults	Males	3	13	9	3	14	5	5	1
		Female	8	16	6	9	5	2	5	1
	Children	Male	–	4	6	–	2	–	4	2
		Female	1	5	1	2	3	–	3	2
	Total	. .	12	38	22	14	24	7	17	6
1944	Adult	Males	3	11	5	7	9	2	2	–
		Females	5	6	6	4	5	3	1	1
	Children	Males	4	–	4	2	–	–	–	1
		Females	1	1	2	5	1	–	1	2
	Total	. .	13	18	17	18	15	5	4	4
1945	Adults	Males	2	8	9	3	9	–	4	–
		Females	4	11	4	4	6	–	5	–
	Children	Males	1	2	2	4	1	–	3	1
		Females	2	1	1	1	–	–	3	–
	Total	. .	9	22	16	12	16	–	15	1
1946	Adults	Males	2	13	9	1	9	–	4	1
		Females	6	12	8	4	10	1	3	4
	Children	Males	–	1	7	5	3	–	–	2
		Females	–	4	1	3	–	–	–	–
	Total	. .	8	30	25	13	22	1	7	7
1947	Adults	Males	–	12	11	4	12	–	1	–
		Females	9	8	8	5	10	1	5	–
	Children	Males	1	4	7	3	2	–	1	4
		Females	2	2	4	7	2	–	–	–
	Total	. .	12	26	30	19	26	1	7	4
1948	Adults	Males	4	9	13	4	11	–	2	5
		Females	5	13	13	8	14	1	9	1
	Children	Males	–	1	2	3	1	–	1	–
		Females	–	–	3	2	1	–	1	–
	Total	. .	9	23	31	17	27	1	13	6
1949	Adults	Males	5	10	9	1	15	2	3	6
		Females	3	7	9	13	15	1	–	1
	Children	Males	1	3	7	3	2	–	–	1
		Females	–	3	2	3	2	–	1	–
	Total	. .	9	23	27	20	34	3	4	8

TABLE 2. — *Diagnosis and Classification on Admission — POLIOMYELITIS PATIENTS*

			StageII	Stage III	Stage IV	Non-Poliomyelitis
1942	Adults	Males	–	4	4	–
		Females	–	–	4	–
	Children	Males	1	2	18	–
		Females	–	–	8	–
	Total		1	6	34	–
1943	Adults	Males	–	–	4	1
		Females	–	–	–	–
	Children	Males	3	–	10	1
		Females	2	1	9	–
	Total		5	1	23	2
1944	Adults	Males	1	–	2	–
		Females	4	–	3	–
	Children	Males	2	1	10	–
		Females	–	3	10	–
	Total		7	4	25	
1945	Adults	Males	–	2	–	–
		Females	2	–	–	–
	Children	Males	5	3	7	1
		Females	3	2	7	–
	Total		10	7	14	1
1946	Adults	Males	2	3	3	–
		Females	6	5	2	–
	Children	Males	6	2	2	–
		Females	7	4	2	–
	Total		21	14	9	–
1947	Adults	Males	2	1	2	–
		Females	5	2	2	–
	Children	Males	6	2	3	–
		Females	3	3	4	–
	Total		16	8	11	–
1948	Adults	Males	–	–	–	–
		Females	–	1	7	–
	Children	Males	–	1	2	–
		Females	–	2	1	–
	Total		–	4	10	–
1949	Adults	Males	–	6	3	–
		Females	–	6	6	–
	Children	Males	–	18	4	–
		Females	–	5	3	–
	Total		–	35	16	–

TABLE 2. — *Diagnosis and Classification on Admission — CRIPPLED CHILDREN*

	Males	Females	Total
1948			
Club Foot	1	1	2
Coza Plana	1	–	1
Rheumatoid Arthritis	–	1	1
Scoliosis, Idiopathic	–	2	2
Spastic Paraplegia	–	1	1
Spastic Paraplegia; Coxa Plana	1	–	1
1949			
Cerebro-spastic palsy	2	2	4
Club Foot	4	–	4
Congenital dislocation and deformities	2	7	9
Obstetrical paralysis	–	1	1
Scoliosis	1	6	7
Non-cogenital deformities	6	4	10

Admission to Lakeville of crippled children began April 1, 1948

TABLE 3. — *Ages of Patients Admitted — TUBERCULOSIS*

	Under 5 yrs.	5 to 9 yrs.	10 to 14 yrs.	15 to 19 yrs.	20 to 29 yrs.	30 to 39 yrs.	40 to 49 yrs.	50 to 59 yrs.	60 to 69 yrs.	70 and over
1942 Males	2	6	6	9	28	13	15	12	9	1
Females	5	2	3	6	20	18	10	6	6	–
1943 Males	–	4	2	9	18	14	10	8	5	1
Females	2	1	7	7	14	23	6	7	1	1
1944 Males	1	2	5	3	9	9	9	4	7	1
Females	–	2	2	8	14	5	4	5	2	2
1945 Males	2	3	7	2	9	10	11	4	1	–
Females	2	–	2	3	11	7	9	6	2	–
1946 Males	2	3	7	3	10	12	9	8	2	1
Females	1	–	2	4	14	18	4	8	4	1
1947 Males	4	2	5	7	12	9	5	11	5	2
Females	4	2	2	7	16	15	8	3	4	2
1948 Males	2	2	2	2	9	14	11	7	2	5
Females	2	3	–	1	15	18	16	7	6	4
1949 Males	3	4	3	6	9	14	9	9	9	2
Females	1	2	1	6	12	14	11	7	2	4

TABLE 3. — *Ages of Patients Admitted — POLIOMYELITIS*

	Under 5 yrs.	5 to 9 yrs.	10 to 14 yrs.	15 to 19 yrs.	20 to 29 yrs.	30 to 39 yrs.	40 to 49 yrs.	50 to 59 yrs.	60 to 69 yrs.	70 and over
1942 Males	–	4	4	12	3	5	1	–	–	–
Females	–	–	2	6	4	–	–	–	–	–
1943 Males	1	1	6	3	6	1	1	–	–	–
Females	1	1	3	6	1	–	–	–	–	–
1944 Males	1	1	2	9	3	–	–	–	–	–
Females	1	1	1	8	7	1	–	1	–	–
1945 Males	1	2	3	9	2	–	–	1	–	–
Females	–	3	3	5	2	1	–	–	–	–
1946 Males	–	3	3	3	2	5	2	–	–	–
Females	1	4	2	4	10	4	1	–	–	–
1947 Males	1	3	–	6	3	2	1	–	–	–
Females	1	1	2	5	4	5	1	–	–	–
1948 Males	–	–	2	1	–	–	–	–	–	–
Females	–	1	2	–	4	3	1	–	–	–
1949 Males	2	3	8	9	6	1	1	1	–	–
Females	–	2	3	3	8	2	2	–	–	–

TABLE 3. — *Ages of Patients Admitted — CRIPPLED CHILDREN*

	Under 5 yrs.	5 to 9 yrs.	10 to 14 yrs	15 to 19 yrs.						
1948 Males	1	2	–	–						
Females	1	–	3	1						
1949 Males	2	5	3	5						
Females	4	2	7	7						

TABLE 4. — *Condition on Discharge — TUBERCULOSIS PATIENTS*

			Arrested	Apparently Arrested	Quiescent	Improved	Unimproved	Deaths	Not Considered	Non-Tuberculous
1942	Adults	Males	20	5	21	10	2	8	3	5
		Females	16	4	12	19	5	7	3	10
	Children	Males	16	–	7	2	–	5	–	6
		Females	15	3	2	2	1	–	2	6
	Total . .		67	12	42	33	8	20	8	27
1943	Adults	Males	13	4	24	7	4	12	5	3
		Females	22	4	12	1	1	6	2	2
	Children	Males	14	1	2	–	1	3	2	4
		Females	13	–	–	–	–	2	–	5
	Total . .		62	9	38	8	6	23	9	14
1944	Adults	Males	19	3	16	5	2	3	7	1
		Females	12	4	7	2	7	2	–	2
	Children	Males	9	2	3	–	–	–	–	1
		Females	8	1	2	1	2	2	–	4
	Total . .		48	10	28	8	11	7	7	8
1945	Adults	Males	8	2	13	2	1	8	2	–
		Females	14	2	8	3	3	4	4	–
	Children	Males	7	2	2	1	–	–	–	3
		Females	6	–	–	3	–	–	–	2
	Total . .		35	6	23	9	4	12	6	5
1946	Adults	Males	6	1	4	10	3	7	4	1
		Females	19	–	4	12	3	4	1	4
	Children	Males	10	–	–	4	–	1	–	2
		Females	4	1	–	–	–	1	–	–
	Total . . .		39	2	8	26	6	13	5	7
1947	Adults	Males	9	1	3	14	4	8	2	1
		Females	4	2	2	31	5	5	7	–
	Children	Males	7	–	1	4	–	3	–	5
		Females	4	1	–	6	1	2	–	–
	Total . . .		24	4	6	55	10	18	9	6
1948	Adults	Males	10	6	–	13	4	3	2	2
		Females	28	2	1	15	2	7	2	1
	Children	Males	6	1	1	1	–	1	–	–
		Females	8	–	–	2	–	–	1	–
	Total . . .		52	9	2	31	6	11	5	3
1949	Adults	Males	16	7	6	17	5	–	–	8
		Females	15	6	22	11	4	4	2	1
	Children	Males	6	1	–	3	–	–	–	1
		Females	5	–	2	–	1	–	–	–
	Total . . .		42	14	30	31	10	4	2	10

TABLE 4. — *Condition on Discharge — POLIOMYELITIS PATIENTS*

			Improved	Unchanged	Deaths	Non-Poliomyelitis
1942	Adults	Males	7	4	–	–
		Females	3	2	–	–
	Children	Males	16	4	–	–
		Females	13	1	–	–
	Total		39	11	–	–
1943	Adults	Males	5	–	–	–
		Females	1	–	–	–
	Children	Males	16	2	–	–
		Females	6	1	–	–
	Total		28	3	–	–
1944	Adults	Males	2	1	1	–
		Females	2	–	–	–
	Children	Males	10	–	1	–
		Females	16	1	–	–
	Total		30	2	2	–
1945	Adults	Males	3	–	–	–
		Females	6	–	–	–
	Children	Males	16	1	–	–
		Females	5	1	–	–
	Total		30	2	–	–
1946	Adults	Males	8	–	–	–
		Females	7	2	1	–
	Children	Males	11	–	–	–
		Females	11	–	–	–
	Total		37	2	1	–
1947	Adults	Males	3	1	–	–
		Females	5	2	–	–
	Children	Males	11	1	–	–
		Females	13	–	–	–
	Total		32	4	–	–
1948	Adults	Males	4	–	–	–
		Females	10	4	–	–
	Children	Males	7	–	–	–
		Females	9	–	1	–
	Total		30	4	1	–
1949	Adults	Males	5	–	–	–
		Females	6	–	–	–
	Children	Males	6	–	–	–
		Females	1	1	–	–
	Total		18	1	–	–

TABLE 4. — *Condition on Discharge — CRIPPLED CHILDREN*

			Improved	Unchanged
1949	Children	Males	11	1
		Females	11	2
		Total	22	3

Admission of crippled children to Lakeville began in April 1948 — no discharges until 1949

TABLE 5. — *Surgical Report — OPERATIONS ON TUBERCULOSIS PATIENTS*

	1942	1943	1944	1945	1946	1947	1948	1949
Amputations	4	1	1	–	3	1	2	1
Appendectomies	–	–	1	–	–	–	1	–
Arthrodeses	25	24	28	11	22	16	22	23
Biopsies	–	–	2	–	1	–	–	–
Exploratory, Laparotomy	3	–	1	–	–	–	–	–
Incision for Drainage	2	4	–	1	–	1	–	–
Nephrectomies	6	9	2	3	3	2	2	5
Other Kidney Operations	4	2	3	1	–	–	–	–
Tonsillectomies and Adenoidectomies	–	–	–	–	8	6	6	5
All other Operations	14	13	6	14	9	7	17	11
Cystoscopies	39	32	20	20	23	21	25	22
Transfusions	19	16	27	10	17	34	29	28
Number of Operations at other Hospitals included	11	9	5	4	4	2	2	8

TABLE 5. — *Surgical Report — OPERATIONS ON POLIOMYELITIS PATIENTS*

	1942	1943	1944	1945	1946	1947	1948	1949
Muscle Transplants*	10	2	4	7	5	4	2	2
Stabilizations*	14	19	3	6	6	8	5	3
Stabilizations and Muscle Transplants	4	–	3	–	1	2	–	–
Tonsillectomies and Adenoidectomies	–	–	–	–	1	–	–	–
All Other Operations	22	11	14	9	2	6	4	2
Transfusions	8	3	5	–	6	9	5	5

* (Includes other procedures such as plastics and tenotomies done at the same time)

TABLE 5. — *Surgical Report — OPERATIONS ON CRIPPLED CHILDREN*

	1949
Muscle Transplants	3
Stabilizations	19
Adenoidectomies	1
All Other Operations	13*

(*Of these operations, 1 was performed at the Massachusetts General Hospital in Boston)

TABLE 6. — *Deaths of Tuberculosis Patients by Length of Residence in Sanatorium*

		Less than 1 month	1 to 3 months	3 to 6 months	6 to 12 months	1 to 2 years	Over 2 years
1942	Adults	3	2	4	4	–	2
	Children	–	1	–	2	–	2
1943	Adults	3	2	4	3	1	5
	Children	–	3	–	1	1	–
1944	Adults	2	–	2	–	1	–
	Children	–	1	–	2	1	2
1945	Adults	1	3	2	2	3	1
	Children	–	–	–	–	–	–
1946	Adults	1	2	2	3	2	1
	Children	1	–	–	–	1	–
1947	Adults	1	3	–	3	3	–
	Children	–	1	2	–	1	1
1948	Adults	4	2	–	2	2	–
	Children	–	–	–	1	–	–
1949	Adults	1	1	1	–	–	1
	Children	–	–	–	–	–	–

TABLE 7. — *Causes of Death*

		Intestines and Peritoneum	Vertebral Column	Other Bones and Joints	Lymphatic System	Genito-Urinary System	Other Tuberculous Conditions	Other Causes	Anterior Poliomyelitis
1942	Adults	1	5	3	1	5	–	–	–
	Children	1	1	2	–	1	–	–	–
1943	Adults	2	3	8	–	5	–	–	–
	Children	–	1	2	–	2	–	–	–
1944	Adults	2	2	–	–	1	–	–	–
	Children	–	1	–	–	1	–	–	–
1945	Adults	1	1	2	3	1	3	1	–
	Children	–	–	–	–	–	–	–	–
1946	Adults	1	3	2	–	2	3	–	1
	Children	–	1	–	–	1	–	–	–
1947	Adults	1	7	3	–	2	–	–	–
	Children	1	2	1	–	1	–	–	–
1948	Adults	1	5	–	–	2	2	–	–
	Children	–	–	1	–	–	–	–	1
1949	Adults	–	–	1	–	1	2	–	–
	Children	–	–	–	–	–	–	–	–

NORTH READING STATE SANATORIUM

TABLE 1. — *Admissions and Discharges — TUBERCULOSIS PATIENTS*

		Patients Admitted	Patients Discharged	Daily Average Number of Patients	Number of Deaths
1942	Males	66	72	75.8	5
	Females	58	93	95.3	10
	Total	124	165	171.1	15
1943	Males	42	61	53.1	9
	Females	55	59	73.5	7
	Total	97	120	126.6	16
1944	Males	43	41	52.7	2
	Females	52	49	71.2	3
	Total	95	90	123.9	5
1945	Males	52	46	51.5	6
	Females	46	46	73.2	4
	Total	98	92	124.7	10
1946	Males	36	32	52.3	4
	Females	37	42	68.6	5
	Total	73	74	120.9	9
1947	Males	35	46	46.4	3
	Females	35	46	56.7	5
	Total	70	92	103.1	8
1948	Males	48	30	52.4	4
	Females	53	43	54.6	4
	Total	101	73	107.0	8
1949	Males	41	36	70.8	1
	Females	27	23	66.9	1
	Total	68	59	137.8	2

TABLE 1. — *Admissions and Discharges — RHEUMATIC FEVER PATIENTS*

		Patients Admitted	Patients Discharged	Daily Average Number of Patients	Number of Deaths
1949	Males	25	16	*	2
	Females	18	10		–
	Total	43	26		2

*Included with number of Tuberculosis patients.

TABLE 2. — *Stage of Disease on Admission — TUBERCULOSIS PATIENTS**

	Primary	Minimal	Moderately Advanced	Advanced	Pleurisy with Effusion	Miliary	Observation and Non-Tuberculosis	Un-Classified	Other
1942 Males	32	6	1	3	5	2	13	–	4
Females	28	4	3	3	3	2	9	4	2
1943 Males	22	1	2	4	2	–	6	3	2
Females	29	9	4	7	2	–	4	–	–
1944 Males	31	3	2	1	1	–	4	1	–
Females	24	6	5	5	2	1	9	–	–
1945 Males	20	6	10	2	2	–	10	–	2
Females	24	6	8	–	6	–	2	–	–
1946 Males	25	3	2	–	1	–	3	2	–
Females	20	2	8	3	1	–	2	–	1
1947 Males	24	2	1	1	–	1	4	2	–
Females	20	3	1	3	1	–	4	3	–
1948 Males	29	8	–	4	2	3	1	–	1
Females	31	7	3	3	–	1	4	2	2
1949 Males	19	3	1	1	2	3	3	1	3
Females	15	5	2	1	1	–	1	–	2

*Rheumatic Fever patients not included.

TABLE 3. — *Ages of Patients Admitted — TUBERCULOSIS**

	Under 5 yrs.	5–9 yrs.	10–14 yrs.	15–19 yrs
1942 Males	16	20	20	10
Females	21	15	15	7
1943 Males	10	11	16	5
Females	13	16	14	12
1944 Males	15	12	9	7
Females	16	12	14	10
1945 Males	15	16	8	4
Females	11	8	15	10
1946 Males	12	14	6	4
Females	11	11	9	6
1947 Males	14	10	9	2
Females	17	6	8	4
1948 Males	18	15	12	3
Females	27	11	10	5
1949 Males	19	11	5	6
Females	10	8	5	4

*Rheumatic Fever patients not included.

TABLE 4. — *Condition on Discharge — TUBERCULOSIS**

	Arrested	Apparently Arrested	Quiescent	Improved	Un-improved	Not Considered	Non-Tuberculous	Dead
1942 Males	36	17	4	7	3	–	–	5
Females	41	20	6	9	7	–	–	10
1943 Males	33	11	–	2	3	3	–	9
Females	21	22	1	4	4	–	–	7
1944 Males	24	7	1	5	1	1	–	2
Females	11	29	1	5	–	–	–	3
1945 Males	26	8	2	2	2	–	–	6
Females	14	20	–	8	–	–	–	4
1946 Males	5	12	6	–	2	–	3	4
Females	19	3	3	6	4	–	2	5
1947 Males	30	4	2	2	1	–	4	3
Females	24	2	4	3	3	1	4	5
1948 Males	7	11	4	2	–	–	2	4
Females	15	8	1	4	3	1	7	4
1949 Males	24	–	2	3	3	–	3	1
Females	11	1	3	4	1	–	2	1

*Rheumatic Fever patients not included.

TABLE 5. — *Deaths of TUBERCULOSIS PATIENTS BY LENGTH OF RESIDENCE IN SANATORIUM*

	1942	1943	1944	1945	1946	1947	1948	1949
Less than 1 month,	2	–	–	2	–	–	1	1
1 to 3 months	3	2	1	–	1	2	2	–
3 to 6 months	2	6	1	–	2	–	3	1
6 to 12 months	1	3	2	2	3	2	–	–
1 to 2 years	2	3	1	2	2	–	1	–
Over 2 years	5	2	–	4	1	4	–	–

TABLE 6. — *Causes of Death — TUBERCULOSIS*

		Tuberculosis of Lungs	Tuberculosis and Other Conditions	Tuberculosis Meningitis	Miliary Tuberculosis	Miliary Tb. with Other Conditions	Other Conditions
1942	Males	1	–	1	2	–	1
	Females	6	1	1	–	1	1
1943	Males	5	1	–	–	–	3
	Females	5	1	–	1	–	–
1944	Males	1	–	–	–	1	–
	Females	2	–	–	–	1	–
1945	Males	4	–	–	–	2	–
	Females	4	–	–	–	–	–
1946	Males	4	–	–	–	–	–
	Females	5	–	–	–	–	–
1947	Males	2	–	–	–	1	–
	Females	5	–	–	–	–	–
1948	Males	2	–	–	–	2	–
	Females	2	–	–	–	2	–
1949	Males	–	–	1	–	–	–
	Females	–	–	1	–	–	–

RUTLAND STATE SANATORIUM

TABLE 1. — *Admissions and Discharges*

		Patients Admitted	Patients Discharged	Daily Average Number of Patients	Number of Deaths
1942	Males	180	167	168.3	42
	Females	94	120	114.0	28
	Total	274	287	282.3	70
1943	Males	155	187	149.9	42
	Females	95	87	106.0	24
	Total	250	274	256.0	66
1944	Males	137	130	140.5	25
	Females	108	113	106.1	20
	Total	245	243	246.6	45
1945	Males	100	108	134.9	35
	Females	68	78	96.2	25
	Total	168	186	231.1	60
1946	Males	125	120	130.2	37
	Females	67	26	93.1	14
	Total	192	188	223.3	51
1947	Males	130	144	127.6	48
	Females	70	66	96.9	15
	Total	200	210	224.5	63
1948	Males	130	122	120.5	42
	Females	79	79	94.8	17
	Total	209	201	215.3	59
1949	Males	144	136	137.3	30
	Females	91	89	93.9	14
	Total	235	225	231.2	44

TABLE 2. — *Stage of Disease on Admission*

		Minimal	Moderately Advanced	Far Advanced	Unclassified	Pleurisy	Non-Tuberculous	Others
1942	Males	26	40	95	10	4	4	1
	Females	12	19	46	10	4	2	1
1943	Males	15	39	89	5	1	5	1
	Females	14	29	46	4	1	1	0
1944	Males	7	36	79	10	3	0	2
	Females	15	33	50	5	0	1	4
1945	Males	7	27	54	10	0	1	1
	Females	6	23	33	4	0	1	1
1946	Males	8	32	75	7	0	0	3
	Females	8	20	34	4	0	0	1
1947	Males	8	29	81	11	0	0	1
	Females	6	13	40	10	0	0	1
1948	Males	7	33	76	8	0	0	6
	Females	16	23	36	2	0	0	2
1949	Males	7	26	94	9	0	0	8
	Females	11	30	40	8	0	0	2

TABLE 3. — *Ages of Patients Admitted*

		Under 20 yrs.	20 to 29 yrs.	30 to 39 yrs.	40 to 49 yrs.	50 to 59 yrs.	60 to 69 yrs.	70 and over
1942	Males	7	38	57	40	21	9	8
	Females	10	33	32	13	2	4	0
1943	Males	9	30	45	29	26	15	1
	Females	7	42	29	10	5	2	0
1944	Males	8	30	41	33	13	12	0
	Females	12	37	37	13	5	3	1
1945	Males	2	18	29	23	16	8	4
	Females	3	28	17	12	3	4	1
1946	Males	4	11	27	36	17	27	3
	Females	6	20	22	12	6	1	0
1947	Males	3	16	22	39	25	23	2
	Females	5	31	18	11	3	2	0
1948	Males	4	15	27	36	26	21	1
	Females	8	35	20	9	4	3	0
1949	Males	5	19	25	32	28	27	8
	Females	6	45	19	11	9	1	0

TABLE 4. — *Condition on Discharge*

		Arrested	Apparently Arrested	Quiescent	Improved	Un-improved	Not Considered	Non-Tuber-culous	Dead	Other Condi-tions
1942	Males	2	16	42	22	29	10	4	42	0
	Females	1	16	40	17	8	6	4	28	0
1943	Males	2	14	58	32	25	9	5	42	0
	Females	3	12	19	11	12	6	0	24	0
1944	Males	2	8	48	19	9	11	8	25	0
	Females	7	7	41	20	11	4	3	20	0
1945	Males	8	11	24	19	4	1	6	35	0
	Females	10	10	14	8	4	2	5	25	0
1946	Males	10	15	21	18	11	1	4	37	3
	Females	5	16	14	10	5	0	1	14	3
1947	Males	5	11	24	22	24	7	3	48	0
	Females	5	11	16	8	3	5	3	15	0
1948	Males	6	7	25	18	13	5	2	42	4
	Females	8	16	23	6	3	1	3	17	2
1949	Males	4	10	28	32	13	6	7	30	6
	Females	4	15	27	16	3	1	5	14	4

TABLE 5. — *Surgical Report — Operations on Patients*

	1942	1943	1944	1945	1946	1947	1948	1949
Pneumolysis	49	40	34	12	26	11	15	26
Bronchoscopy	58	34	69	64	45	28	21	32
Phrenic emphraxis	–	–	4	–	1	6	–	–
Rib resection	–	3	–	3	3	1	1	1
Other operations	43	7	12	18	28	33	17	13
Thoracoscopy	–	–	–	–	4	1	–	3
Pneumoperitoneum	–	–	–	–	58	195	129	113
Artificial pneumothorax refills	3747	3857	3052	2363	2710	1864	1771	2019
Aspirations	184	145	144	106	115	128	166	100
Total number of in patients who received pneumothorax	146	*	68	130	190	119	196	156
Total number of outpatients who received pneumothorax	78	*	38	40	47	45	47	47

*Figure not available.

TABLE 5. — *Surgical Report — Operations at Massachusetts General Hospital*

	1942	1943	1944	1945	1946	1947	1948	1949
Thoracoplasty	18	14	22	16	16	8	24	31
Pneumonectomy	2	3	8	3	–	2	–	–
Lobectomy	2	1	5	3	2	2	2	1
Other operations	9	1	4	4	–	–	1	2

TABLE 6. — *Deaths of Tuberculosis Patients by Length of Residence in Sanatorium*

	1942	1943	1944	1945	1946	1947	1948	1949
Less than 1 month	12	5	6	6	6	7	6	4
1 to 3 months	20	15	8	11	6	15	9	6
3 to 6 months	12	15	7	14	1	10	8	6
6 to 12 months	7	9	5	11	8	11	12	8
1 to 2 years	6	9	11	5	14	4	12	7
Over 2 years	13	13	8	13	16	16	12	13

TABLE 7. — *Causes of Death*

1942

	Males	Female
Pulmonary tuberculosis	24	20
Pulmonary tuberculosis and tuberculous laryngitis	6	–
Pulmonary tuberculosis, laryngitis, and anorectal fistula	1	–
Bronchopneumonia	1	1
Bronchopleural fistula due to pulmonary tuberculosis	1	–
Epidermoid carcinoma of the left bronchus; multiple lung abscesses, left; left bronchopleural fistula; incapsulated empyema, left; probable massive pulmonary infarction	1	–
Pulmonary tuberculosis and tuberculous empyema	1	1
Cerebral hemorrhage due to arteriosclerosis, arteriosclerosis; bronchopneumonia	1	–
Perforation of intestine and pulmonary tuberculosis	–	1
Diabetes mellitus	–	1
Pulmonary tuberculosis and tuberculous enteritis	3	1
Pulmonary tuberculosis; pyopneumothorax; amyloidosis of kidney, liver and spleen	1	–
Pulmonary tuberculosis; tuberculous pneumonia; tuberculous enteritis	–	1
Pulmonary tuberculosis; diabetes mellitus; lues; progressive muscular atrophy	–	1
Pulmonary tuberculosis; tuberculous laryngitis; tuberculous enteritis; tuberculous meningitis	1	–
Pulmonary tuberculosis and silicosis	1	–
Pulmonary tuberculosis and diabetes mellitus	–	1

1943

	Males	Females
Pulmonary tuberculosis	33	13
Pulmonary tuberculosis; tuberculous laryngitis; amyloidosis of liver and kidneys	–	1
Pulmonary tuberculosis and intestinal fistula	–	1
Pulmonary tuberculosis; tuberculous laryngitis; tuberculous enteritis	1	0
Pulmonary tuberculosis and diabetes mellitus	1	3
Pulmonary tuberculosis; tuberculosis of spine; tuberculous peritoneum	1	0
Pulmonary tuberculosis; tuberculous enteritis; ulceration of bronchi	–	1
Pulmonary tuberculosis; pernicious anemia; tuberculous enteritis	–	1
Pulmonary tuberculosis; pericardial effusion	1	–
Hypertrophy of heart due to overstrain; pulmonary tuberculosis	1	0
Pulmonary tuberculosis; emphysema; mild hypertension; acute laryngitis	1	–
Pulmonary tuberculosis; tuberculous enteritis	–	3
Pulmonary tuberculosis; tuberculous laryngitis	1	1
Pulmonary tuberculosis; peripheral arteriosclerosis	1	–
Pulmonary tuberculosis; nephrosclerosis	1	–

TABLE 7. — *Causes of Death* — Continued

1944

	Males	Females
Pulmonary tuberculosis	10	14
Pulmonary tuberculosis and tuberculous meningitis	1	–
Pulmonary tuberculosis and tuberculous laryngitis	2	2
Pulmonary tuberculosis and tuberculous enteritis	4	–
Coronary thrombosis and pulmonary tuberculosis	1	–
Pulmonary tuberculosis; glandular tuberculosis; lymphogranuloma inguinale	–	1
Pulmonary tuberculosis and mixed empyema	–	1
Pulmonary tuberculosis; tuberculosis of peritoneum; tuberculosis of kidney	1	0
Pulmonary tuberculosis and rheumatic heart disease	1	–
Pulmonary tuberculosis and tuberculosis pleurisy	1	1
Pulmonary tuberculosis and acute laryngitis	1	–
Pulmonary tuberculosis and bronchial tuberculosis	1	–
Pulmonary tuberculosis and glandular abscesses	1	–
Pulmonary tuberculosis and bronchopleural fistula	1	–
Pulmonary tuberculosis and tuberculous empyema	–	1

1945

	Males	Females
Pulmonary tuberculosis	16	11
Pulmonary tuberculosis and arteriosclerotic nephrosclerosis	1	–
Pulmonary tuberculosis and pulmonary insufficiency	–	1
Pulmonary tuberculosis and cor pulmonale	1	1
Pulmonary tuberculosis, tuberculous pleurisy and tuberculous enteritis	2	1
Pulmonary tuberculosis and simple laryngitis	2	–
Bronchopneumonia due to aspiration of foreign body	–	1
Pulmonary tuberculosis and tuberculous laryngitis	3	1
Tuberculous meningitis and pulmonary tuberculosis	1	–
Pulmonary tuberculosis and tuberculous pleurisy	–	1
Pulmonary tuberculosis and bronchial tuberculosis	–	1
Pulmonary tuberculosis and bronchiectasis	1	–
Pulmonary tuberculosis and empyema	–	1
Pulmonary tuberculosis, chronic myocarditis and bronchopleural fistula	1	–
Pulmonary tuberculosis and generalized abdominal tuberculosis	–	1
Pulmonary tuberculosis and cardiac insufficiency	1	–
Pulmonary tuberculosis, tuberculous enteritis, tuberculous ascites and chronic alcoholism	1	–
Pulmonary tuberculosis and bronchial ulcers	–	1
Pulmonary tuberculosis, empyema and bronchopleural fistula	–	1
Pulmonary tuberculosis and diabetes mellitus	3	2
Tuberculosis of cervical spine and pulmonary tuberculosis	1	–
Pulmonary tuberculosis, tuberculous colitis and nephritis with edema	–	1
Pulmonary tuberculosis, hypertension, arterial cerebral shock, encephalomacia due to arterial hypertension	1	–

1946

	Males	Females
Pulmonary tuberculosis	17	8
Pulmonary tuberculosis, biliary cirrhosis	–	1
Pulmonary tuberculosis, chronic alcoholism, malnutrition	1	–
Pulmonary tuberculosis, tuberculous laryngitis	2	1
Pulmonary tuberculosis, tuberculous enteritis	1	–
Pulmonary tuberculosis, tuberculosis of seminal vesicles	1	–
Pulmonary tuberculosis, myocarditis	1	–
Pulmonary tuberculosis, bronchial asthma	1	–
Lung abscess, bronchiectasis	1	–
Pulmonary tuberculosis, tuberculous peritonitis	1	–
Pulmonary tuberculosis, chronic cor pulmonale	1	–
Pulmonary tuberculosis, cirrhosis of liver	1	–
Pulmonary insufficiency due to tuberculosis, pneumoconiosis, tuberculous laryngitis	1	–
Pulmonary tuberculosis, tuberculous empyema, tuberculous fistula of chest wall	1	–
Pulmonary tuberculosis, dilatation of the heart due to pulmonary lesion, cardiovascular heart disease	1	–
Pulmonary tuberculosis, tuberculous pleurisy	–	1
Pulmonary tuberculosis, pneumoconiosis	2	–
Pulmonary tuberculosis, tuberculous empyema	–	1
Pulmonary tuberculosis, tuberculous empyema, tuberculous enteritis, tuberculosis of thoracic spine, cerebral hemorrhage, tuberculous meningitis	1	–
Pulmonary tuberculosis, bronchopleural fistula, tuberculous empyema	–	1
Pulmonary tuberculosis, diabetes mellitus	1	–
Pulmonary tuberculosis, tuberculous enteritis, tuberculous pleurisy	–	1
Pulmonary tuberculosis, chronic alcoholism, malnutrition, avitaminosis, chronic gastritis	1	–
Pulmonary tuberculosis, tuberculous empyema, tuberculous laryngitis	1	–

1947

	Males	Females
Pulmonary tuberculosis	31	10
Pulmonary tuberculosis, tuberculous enteritis	3	1
Pulmonary tuberculosis, tuberculous enteritis, generalized tuberculosis of the abdomen	1	–

TABLE 7. — *Causes of Death, 1947*—Continued

	Males	Females
Pulmonary tuberculosis, tuberculous enteritis, chronic alcoholism	1	–
Pulmonary tuberculosis, tuberculous laryngitis	4	–
Pulmonary tuberculosis, malnutrition, amyloidosis	–	1
Pulmonary insufficiency due to pulmonary tuberculosis, silicosis	1	–
Pulmonary tuberculosis, tuberculous enteritis, tuberculous sigmoiditis	1	–
Pulmonary tuberculosis, lymphadenitis	1	–
Pulmonary tuberculosis, tuberculous laryngitis, tuberculous enteritis, chronic alcoholism	1	–
Pulmonary tuberculosis, empyema, endobronchial tuberculosis	–	1
Myocarditis, pulmonary tuberculosis	–	1
Pulmonary tuberculosis, tuberculous empyema	1	–
Tuberculous meningitis, pulmonary tuberculosis	1	–
Pulmonary tuberculosis, tuberculous enterocolitis	–	1
Pulmonary tuberculosis, tuberculous epiglottis	1	–
Pulmonary tuberculosis, tuberculous meningitis, pneumonia	1	–

1948

	Males	Females
Pulmonary tuberculosis	19	9
Pulmonary tuberculosis, diabetes mellitus	3	1
Pulmonary tuberculosis, tuberculosis of larynx	1	–
Pulmonary tuberculosis, tuberculosis of intestine	4	4
Pulmonary tuberculosis, tuberculosis of intestine, tuberculous peritonitis	1	–
Cerebral hemorrhage, pulmonary tuberculosis	1	–
Pulmonary tuberculosis, tuberculous enterocolitis	1	–
Pulmonary tuberculosis, bronchiectasis, emphysema, amyloidosis of liver, spleen, kidney	1	–
Pulmonary tuberculosis, moderate hypertension, heart failure, emphysema, chronic alcoholism	1	–
Pulmonary tuberculosis, tuberculosis of bronchus, tuberculosis of intestine	–	1
Pulmonary tuberculosis, bronchiectasis	–	1
Pulmonary tuberculosis, tuberculous empyema, tuberculosis of bronchus, nephrosis, chest wall tuberculosis	–	1
Silicosis	1	–
Pulmonary tuberculosis, tuberculous empyema, bronchopleural fistula, tuberculosis of thoracic wall	1	–
Pulmonary tuberculosis, diabetes mellitus, chronic alcoholism	1	–
Pulmonary tuberculosis, spontaneous pneumothorax, tuberculous empyema	1	–
Pulmonary tuberculosis, tuberculous empyema	1	–
Pulmonary tuberculosis, tuberculosis of kidney	1	–
Pulmonary tuberculosis, arteriosclerosis, generalized acromegalia	1	–
Pulmonary tuberculosis, dilatation of heart due to overstrain	1	–
Pulmonary tuberculosis, tuberculosis of larynx, tuberculosis of intestine	1	–
Dilatation of heart, pulmonary tuberculosis	1	–

1949

	Males	Females
Pulmonary tuberculosis	20	11
Pulmonary tuberculosis, tuberculous meningitis, tuberculosis of intestine	1	–
Pulmonary tuberculosis, tuberculosis of intestine, tuberculosis of larynx	1	–
Granulocytopenia	1	–
Pulmonary tuberculosis, diabetes mellitus	1	1
Pulmonary tuberculosis, secondary anemia	1	–
Pernicious anemia, pulmonary tuberculosis	1	–
Pulmonary tuberculosis, tuberculosis of intestine	2	2
Pulmonary tuberculosis, ulcerative colitis	1	–
Pulmonary tuberculosis, tuberculosis of larynx	1	–

WESTFIELD STATE SANATORIUM

TABLE 1. — *Admissions and Discharges — TUBERCULOSIS PATIENTS*

		Patients Admitted	Patients Discharged	Daily Average Number of Patients	Number of Deaths
1942	Males	106	92	78.8	28
	Females	64	81	77.0	11
1943	Males	104	125	79.1	31
	Females	94	105	79.2	17
1944	Males	129	149	63.2	30
	Females	81	94	69.0	12
1945	Males	156	123	66.2	38
	Females	94	71	68.7	27
1946	Males	80	91	70.4	26
	Females	65	76	77.6	17
1947	Males	57	69	60.1	18
	Females	69	71	73.3	16
1948	Males	68	63	57.4	23
	Females	54	50	73.6	10
1949	Males	56	54	63.	12
	Females	50	53	73.	7

TABLE 1. — *Admissions and Discharges — CANCER PATIENTS*

		Patients Admitted	Patients Discharged	Daily Average Number of Patients	Number of Deaths
1942	Males	320	327	19.5	42
	Females	386	380	21.5	15
1943	Males	172	175	8.1	9
	Females	211	218	10.6	2
1944	Males	150	151	7.6	11
	Females	214	214	10.2	6
1945	Males	128	125	6.7	18
	Females	209	211	10.2	6
1946	Males	170	172	8.4	18
	Females	275	272	9.4	13
1947	Males	180	180	7.3	18
	Females	296	291	11.6	14
1948	Males	159	158	8.2	22
	Females	252	253	12.7	15
1949	Males	208	206	10.	23
	Females	267	268	13.	13

TABLE 2. — *Stage of Disease on Admission — TUBERCULOSIS PATIENTS*

		Minimal	Moderately Advanced	Far Advanced	Unclassified	Pleurisy	Non-Tuberculous	Others
1942	Males	11	24	55	3	–	12	1
	Females	14	14	27	3	1	4	1
1943	Males	15	21	51	3	1	4	8
	Females	23	22	42	–	–	4	3
1944	Males	21	20	70	8	2	4	4
	Females	17	17	35	7	1	3	1
1945	Males	8	9	101	27	2	7	2
	Females	8	9	46	23	1	5	2
1946	Males	5	5	37	30	–	–	3
	Females	13	7	17	26	1	–	1
1947	Males	3	14	27	12	–	1	–
	Females	13	14	23	15	3	–	1
1948	Males	3	13	38	12	1	–	1
	Females	4	14	25	10	1	–	–
1949	Males	1	10	27	17	1	–	0
	Females	0	11	25	13	0	–	1

TABLE 2. — *Stage of Disease on Admission — CANCER PATIENTS*

		Early	Moderately Advanced	Advanced	Non-Malignant
1942	Males	22	60	92	44
	Females	49	46	98	64
1943	Males	23	44	38	18
	Females	26	54	23	41
1944	Males	16	19	55	21
	Females	29	38	52	24
1945	Males	17	16	56	10
	Females	28	55	41	31
1946	Males	17	31	64	18
	Females	26	57	46	66
1947	Males	20	28	52	29
	Females	33	46	47	85
1948	Males	17	30	48	28
	Females	36	35	46	73
1949	Males	34	26	48	22
	Females	26	33	50	77

TABLE 3. — *Ages of Patients Admitted — TUBERCULOSIS PATIENTS*

		Under 20 yrs.	20 to 29 yrs.	30 to 39 yrs.	40 to 49 yrs.	50 to 59 yrs.	60 to 69 yrs.	70 to 79 yrs.	80 and over
1942	Males	4	30	18	20	15	16	2	1
	Females	8	26	20	5	3	2	–	–
1943	Males	5	22	24	22	20	7	4	–
	Females	11	27	28	13	13	1	–	1
1944	Males	4	22	28	25	31	18	–	1
	Females	18	31	16	6	6	4	–	–
1945	Males	4	21	30	47	24	26	4	–
	Females	9	38	17	17	9	3	1	–
1946	Males	1	12	15	25	12	11	3	1
	Females	6	31	12	6	6	3	0	1
1947	Males	3	4	7	17	10	10	6	0
	Females	10	28	19	3	6	3	0	0
1948	Males	4	6	22	14	9	12	1	0
	Females	7	22	18	2	2	2	1	0
1949	Males	1	5	11	21	11	3	2	2
	Females	4	21	16	5	1	3	0	0

TABLE 3. — *Ages of Patients Admitted — CANCER PATIENTS*

		Under 20 yrs.	20 to 29 yrs.	30 to 30 yrs.	40 to 49 yrs.	50 to 59 yrs.	60 to 69 yrs.	70 to 79 yrs.	80 and over
1942	Males	1	5	12	20	52	74	47	7
	Females	3	4	21	67	78	53	26	5
1943	Males	3	1	3	8	24	42	36	6
	Females	4	4	16	22	29	42	25	2
1944	Males	5	2	2	13	22	40	23	4
	Females	3	5	14	21	35	35	26	4
1945	Males	3	2	2	6	16	39	26	5
	Females	2	7	20	29	37	36	20	4
1946	Males	2	1	2	9	35	52	26	3
	Females	2	2	19	49	56	40	25	2
1947	Males	2	2	2	12	30	37	32	12
	Females	4	6	24	43	50	46	28	10
1948	Males	5	0	2	11	22	48	29	6
	Females	3	9	21	35	50	41	22	9
1949	Males	1	3	3	12	26	44	30	11
	Females	0	10	16	43	43	37	33	4

TABLE 4. — *Condition on Discharge — TUBERCULOSIS PATIENTS*

		Arrested	Apparently Arrested	Quiescent	Improved	Unimproved	Deaths	Not Considered	Non-Tuberculous
1942	Males	–	30	2	13	19	28	–	–
	Females	–	31	1	18	18	11	–	2
1943	Males	–	34	7	31	22	31	–	–
	Females	–	41	5	16	26	17	–	–
1944	Males	6	30	–	32	50	30	–	1
	Females	2	32	–	15	33	12	–	–
1945	Males	–	16	2	19	43	39	–	4
	Females	–	16	–	9	18	27	–	1
1946	Males	–	13	–	18	31	26	1	2
	Females	–	30	1	15	11	17	–	1
1947	Males	–	17	5	8	15	18	–	6
	Females	1	29	5	11	8	16	–	1
1948	Males	1	8	2	11	14	23	–	4
	Females	3	16	10	5	3	10	–	3
1949	Males	1	2	2	4	13	12	1	1
	Females	1	37	3	1	3	7	–	1

TABLE 4. — *Condition on Discharge — CANCER PATIENTS*

		Improved	Unimproved	Died
1942	Males	212	73	42
	Females	278	87	15
1943	Males	122	44	9
	Females	166	50	2
1944	Males	109	31	11
	Females	165	43	6
1945	Males	78	29	18
	Females	156	49	6
1946	Males	118	36	18
	Females	211	48	13
1947	Males	130	32	18
	Females	222	55	14
1948	Males	109	27	22
	Females	200	38	15
1949	Males	154	29	23
	Females	229	26	13

TABLE 5. — *Surgical Report — TUBERCULOSIS*

	1942	1943	1944	1945	1946	1947	1948	1949
Thoracoplasty	7	10	–	–	13	53	32	67
Pneumolysis	27	6	–	–	49	40	17	12
Bronchoscopy	4	7	13	10	6	28	55	26
Phrenic Emphraxis	3	2	5	3	3	3	3	–
Thoracoscopy	4	2	–	1	–	3	4	–
Other Operations	16	20	40	42	54	51	120	27
Aetificial Pneumothorax	6602	3509	2869	1245	1564	3934	2954	2876

TABLE 5. — *Surgical Report — CANCER*

	1942	1943	1944	1945	1946	1947	1948	1949
Operations	652	399	434	404	549	590	566	613
Biopsies	465	443	411	289	352	328	434	322
Endoscopies	448	354	402	444	289	226	231	246
Transfusions	195	171	149	289	365	470	518	593
Anesthetics given	1445	937	966	979	1230	1219	1305	1279
Autopsies	36	8	11	16	23	25	20	20
X-ray Treatments	8278	5726	6200	6639	5552	5596	5818	5279
Radium Treatments	113	62	99	83	70	56	53	71

TABLE 6. — *Deaths of TUBERCULOSIS PATIENTS by Length of Residence in Sanatorium*

		Less than 1 month	1 to 3 months	3 to 6 months	6 to 12 months	1 to 2 years	Over 2 years
1942	Males	4	6	7	4	4	3
	Females	4	2	2	2	1	0
1943	Males	8	6	3	8	1	5
	Females	3	6	2	2	3	1
1944	Males	10	5	5	5	3	2
	Females	1	2	3	1	4	1
1945	Males	19	9	4	3	3	0
	Females	4	3	3	6	7	4
1946	Males	4	5	6	3	3	5
	Females	1	2	3	3	5	3
1947	Males	5	3	1	3	5	1
	Females	1	4	2	3	4	2
1948	Males	3	1	5	3	7	4
	Females	0	1	0	1	4	4
1949	Males	1	1	1	3	2	4
	Females	0	3	0	2	2	0

TABLE 7. — *Causes of Death — TUBERCULOSIS PATIENTS*

1942

	Males	Females
Pulmonary tuberculosis, silicosis, cardiac failure	1	0
Bronchiogenic carcinoma	1	0
Carcinoma of right kidney	1	0
Carcinoma of sigmoid; pulmonary embolism; bronchiectasis	1	0
Coronary thrombosis, carcinoma of left breast with metastases, pulmonary tuberculosis—apparently arrested	0	1
Miliary tuberculosis with tuberculous meningitis	0	1
Pulmonary tuberculosis	15	4
Pulmonary tuberculosis; carcinoma of left breast	0	1
Pulmonary tuberculosis and pulmonary hemorrhage	1	0
Pulmonary tuberculosis, diabetes mellitus, old coronary thrombosis	0	1
Pulmonary tuberculosis, tuberculous enteritis and laryngitis	1	0
Pulmonary tuberculosis, and tuberculous laryngitis	2	–
Pulmonary tuberculosis, pneumonia	0	1
Pulmonary tuberculosis, Pott's Disease, Spontaneous pneumothorax	1	0
Pulmonary tuberculosis, tuberculous pyonephritis	0	1
Pulmonary tuberculosis, rheumatic heart disease, cirrhosis of liver	1	0
Pulmonary tuberculosis, silicosis, tuberculous kidney, adrenal and ileum, pulmonary hemorrhage	1	0
Pulmonary tuberculosis and uremia	1	0
Tuberculous adenitis	1	0
Tuberculous meningitis, pulmonary tuberculosis, tuberculosis empyema	0	1

1943

	Males	Females
Bronchiectasis and Lung Abscess	0	1
Miliary tuberculosis	0	1
Miliary tuberculosis with pericarditis	1	0
Pulmonary tuberculosis	26	12
Pulmonary tuberculosis with brain abscess	1	0
Pulmonary tuberculosis with diabetes	2	1
Pulmonary tuberculosis with tuberculous enteritis	0	1
Pulmonary tuberculosis with tuberculous laryngitis	1	0
Pulmonary tuberculosis with tuberculous meningitis	0	1

1944

	Males	Females
Bilateral pulmonary tuberculosis	0	1
Pulmonary tuberculosis	25	11
Pulmonary tuberculosis with tuberculous meningitis	1	0
Pulmonary tuberculosis with pulmonary neoplasm	1	0
Pulmonary tuberculosis with unknown heart disease	1	0
Tumor of kidney, probably hypernephroma	1	0
Pulmonary tuberculosis with circulatory failure, unknown cause	1	0

1945

	Males	Females
Bilateral pulmonary tuberculosis	4	0
Bronchiogenic carcinoma	1	0
Clinical tuberculosis with unknown heart disease	1	0
Extrapulmonary tuberculosis with tuberculous enteritis and peritonitis	0	1
Pulmonary fibrosis with sarcoid disease	1	0
Pulmonary tuberculosis	24	21
Pulmonary tuberculosis with tuberculous enteritis	0	1
Pulmonary tuberculosis with epilepsy	1	0
Pulmonary tuberculosis with tuberculous laryngitis	5	0
Pulmonary tuberculosis with tuberculous meningitis	0	3
Pulmonary tuberculosis with tuberculous spine	0	1
Retroperitoneal sarcoma	1	0

1946

	Males	Females
Pulmonary fibrosis, coronary thrombosis, bronchiectasis and bronchial pneumonia	1	0
Pulmonary tuberculosis	14	14
Pulmonary tuberculosis, question of brain tumor	0	1
Pulmonary tuberculosis with right pleural effusion	1	0
Pulmonary tuberculosis with diabetes	0	1
Pulmonary tuberculosis with miliary tuberculosis	1	0
Pulmonary tuberculosis with Pott's disease	1	0
Pulmonary tuberculosis with tuberculous empyema, bronchiopleural fistula and tuberculous enteritis	1	0
Pulmonary tuberculosis with tuberculous enteritis	2	0
Pulmonary tuberculosis with tuberculous enteritis, tuberculous empyema and tuberculous tongue	0	1
Pulmonary tuberculosis with tuberculous laryngitis	2	0
Pulmonary tuberculosis with tuberculous meningitis	1	0
Pulmonary tuberculosis with tuberculous meningitis, tuberculous laryngitis and tuberculous enteritis	1	0
Pulmonary tuberculosis with tuberculosis of right tonsil	1	0

TABLE 7. — *Causes of Deaths — TUBERCULOSIS PATIENTS*—Continued

1947

	Males	Females
Advanced pulmonary tuberculosis	9	7
Advanced with endenocarcinoma of rectum	1	0
Advanced with bronchopleural fistula	1	0
Advanced with diabetes	0	2
Advanced with diabetes, hypertension with hemiplegia	0	1
Advanced with empyema	0	1
Advanced with tuberculous enteritis	2	1
Advanced with tuberculous laryngitis	1	2
Advanced with tuberculous meningitis	1	0
Advanced with tuberculous spine, hip and renal tuberculosis	1	0
Minimal with chronic arthritis and self-induced hemorrhage	0	1
Meningitis, origin undetermined	0	1
Moderately advanced with effusion, diabetes and presumably tuberculous enteritis	1	0
Moderately advanced, question activity, with gastric hemorrhage	1	0

1948

	Males	Females
Advanced Pulmonary Tuberculosis	14	10
Advanced with Diabetes	1	0
Advanced with pleurisy with effusion	1	0
Advanced with pleural-cutaneous fistula, tuberculous empyema and bronchopleural fistula	1	0
Advanced with pleuro-cutaneous fistula, tuberculous empyema and tuberculous enteritis	1	0
Advanced with tuberculous enteritis	1	0
Advanced with tuberculous enteritis and myocardial insufficiency	1	0
Advanced with tuberculous laryngitis	1	0
Carcinoma of lung with pleurisy with effusion	1	0
Advanced with widely disseminated bone tuberculosis superimposed on sarcoid disease	1	0

1949

	Males	Females
Advanced pulmonary tuberculosis	8	7
Coronary heart disease with congestive heart failure, advanced pulmonary tuberculosis	1	0
Drowning in fluids due to rupture, advanced pulmonary tuberculosis	1	0
Questionable cerebral hemorrhage, advanced pulmonary tuberculosis	1	0
Terminal hemorrhage, advanced pulmonary tuberculosis	1	0

PONDVILLE HOSPITAL

TABLE 1. — *Admissions and Discharges*

		Patients Admitted	Patients Discharged	Daily Average Number of Patients	Number of Deaths
1942	Males	528	537	40.8	64
	Females	584	602	40.0	32
	Total	1,112	1,139	80.8	96
1943	Males	392	405	26.6	42
	Females	470	481	25.0	20
	Total	862	886	51.3	62
1944	Males	342	349	21.4	19
	Females	380	388	20.4	8
	Total	722	737	41.8	27
1945	Males	292	274	17.7	23
	Females	362	353	16.4	10
	Total	654	627	34.1	33
1946	Males	329	295	19.6	27
	Females	398	378	19.6	14
	Total	727	673	39.2	41
1947	Males	370	347	17.0	28
	Females	430	420	19.8	14
	Total	800	767	36.8	42
1948	Males	365	328	21.8	30
	Females	461	430	23.5	26
	Total	826	758	45.3	56
1949	Males	362	337	22.1	35
	Females	495	472	25.9	18
	Total	857	809	48.0	53

TABLE 2. — *Stage of Disease on Admission*

		Early	Moderately Advanced	Advanced	Non-Malignant	Unclassified
1942	Males	31	80	134	59	9
	Females	39	89	104	153	7
	Total	70	169	238	212	16
1943	Males	28	66	77	42	5
	Females	29	68	62	111	6
	Total	57	134	139	153	11
1944	Males	26	64	72	40	5
	Females	26	55	56	91	3
	Total	52	119	128	131	8
1945	Males	20	46	79	34	–
	Females	24	42	61	96	–
	Total	44	88	140	130	0
1946	Males	11	59	82	38	–
	Females	13	69	53	100	1
	Total	24	128	135	138	1
1947	Males	12	59	94	45	2
	Females	19	39	71	120	3
	Total	31	98	165	165	5
1948	Males	14	71	89	36	3
	Females	15	48	68	155	3
	Total	29	119	157	191	6
1949	Males	25	50	86	54	2
	Females	28	58	61	158	8
	Total	53	108	147	212	10

TABLE 3. — *Ages of Patients Admitted*

		Under 20 yrs.	20 to 29 yrs.	30 to 39 yrs.	40 to 49 yrs.	50 to 59 yrs.	60 to 69 yrs.	70 to 79 yrs.	80 to 89 yrs.	90 to 99 yrs.	Unknown
1942	Males	3	10	14	26	86	93	57	21	1	2
	Females	6	15	39	94	92	79	49	17	1	–
1943	Males	3	3	9	20	49	64	57	12	1	–
	Females	2	6	28	66	64	58	40	11	1	–
1944	Males	2	3	4	12	41	77	49	16	3	–
	Females	4	15	24	46	58	48	33	3	–	–
1945	Males	3	1	2	14	36	61	–	–	–	–
	Females	3	18	23	47	55	41	–	–	–	–
1946	Males	2	2	8	12	34	56	57	21	–	–
	Females	6	8	29	39	53	50	43	6	–	–
1947	Males	2	7	9	25	33	65	58	15	–	–
	Females	4	11	39	44	49	48	50	5	–	–
1948	Males	2	4	6	14	48	73	52	16	–	–
	Females	9	16	36	62	65	58	34	6	1	–
1949	Males	5	2	8	13	37	80	56	16	–	–
	Females	7	21	35	76	66	56	43	8	1	–

TABLE 4. — *Condition on Discharge*

		Improved	Unimproved	Deaths
1942	Males	368	105	64
	Females	465	105	32
1943	Males	299	64	42
	Females	388	73	20
1944	Males	262	68	19
	Females	343	37	8
1945	Males	205	69	23
	Females	284	69	10
1946	Males	223	72	27
	Females	311	67	14
1947	Males	257	90	28
	Females	345	75	14
1948	Males	248	80	30
	Females	360	70	26
1949	Males	267	71	35
	Females	391	80	18

TABLE 5. — *Surgical Report*

	1942	1943	1944	1945	1946	1947	1948	1949
Operations	983	814	792	741	833	963	967	982
Biopsies	351	156	91	161	297	180	328	341
Endoscopies	324	257	213	205	304	343	410	406
Transfusions	322	276	269	258	468	454	706	716
Anesthetics given	1162	889	855	770	893	979	1064	1059
Autopsies	69	51	23	25	29	37	41	45
X-ray treatments	9201	4946	5379	5290	5783	5809	5401	5642
Radium treatments	242	172	198	148	123	191	139	126

TABLE 6. — *Clinic Examinations*

	1942	1943	1944	1945	1946	1947	1948	1949
Visits to regular Thursday Clinics	4022	3754	3932	3682	4232	4889	5166	5611
Average attendance	82.1	75.8	77	75	86.3	97.8	103.3	110.0
First visits	1024	814	931	880	836	*	*	*
Total clinic visits	6455	6084	6815	6205	7025	8085	8687	9660
Clinic patients admitted to Hospital	475	368	367	381	405	420	456	465

* Information not available

DIVISION OF BIOLOGIC LABORATORIES
CONSOLIDATED REPORT 1942–1949

Geoffrey Edsall, M.D., *Director*

General Statement

The impact of World War II during this period brought the laboratory into a close cooperative effort with the Harvard Medical School in O.S.R.D. biologic studies for the armed forces and plasma fractions pilot work for the Navy. It should be noted that personnel depletion was continuous throughout the period.

Plans for a statewide civilian blood program culminated in the dedication on March 26, 1947 of the third major physical expansion of the laboratory, built with funds furnished through the generosity of the Godfrey M. Hyams Trust. The expanded facilities allowed the establishment of a tetanus laboratory, new smallpox quarters, and additional stockroom space.

As the whole blood program developed, the American Red Cross, in an expanding national program, began financing this work and also began the operation of the field units on March 1, 1948. On March 1, 1950 they assumed operation of the whole blood processing and distribution. Pilot studies in plasma fractions began under the same auspices in 1949. State funds for blood were then only applied to the fractionation of outdated plasma for the State's use.

In 1946 the laboratory began the control testing of human blood fractions produced under the Cohn patents and financed by Research Corporation.

Licenses were granted by the Federal Security Agency for:

Immune Serum Globulin (Human)
Anti Hemophilus Influenzae Type b Serum
Schick Test Control
Tetanus Toxoid (Fluid)
Pertussis Vaccine

Licenses revoked without prejudice:

Diphtheria Toxin-Antitoxin Mixture
Pneumococcus Typing Serum

Dr. Elliott S. Robinson, Director of the Division since 1933, was retired in 1947 because of ill health, and Dr. Geoffrey Edsall, wartime Acting Director, assumed the Directorship.

Investigations:

An incomplete listing includes:

1. Human albumin and plasma fractions
2. Shellfish studies
3. Smallpox studies
4. Diphtheria antitoxin, enzyme digestion
5. Diphtheria toxin and Schick toxin
6. Diphtheria toxoid purification
7. Tetanus toxin, toxoid and antitoxin
8. Pertussis vaccine
9. Serum jaundice
10. Purification of typhoid vaccine

Distribution of Products

	1941	1942	1943	1944	1945	1946	1947	1948	1949
Diphtheria									
Antitoxin, 1000 unit doses	44,989	43,334	32,398	36,722	39,580	70,995	51,704	46,475	52,619
Schick Outfits, 50 doses each	3,842	4,081	3,297	3,372	3,279	5,259	4,101	4,025	4,068
Toxin-Antitoxin Mixture, 1 cc. doses	44,682	46,443	46,286	37,999	25,612	22,583	9,408	–	–
Toxoid, 1 cc. doses	248,003	281,368	233,373	251,466	211,917	349,487	294,430	200,856	183,252
Toxoid, alum precipitated, 1 cc. doses	–	–	–	–	–	–	12,118	42	–
Toxin — Bulk cc.	1,715	6,785	975	965	580	470	410	420	1,605
Antitoxin — Bulk cc.	–	–	–	–	–	–	650	60	1,350
Diphtheria-tetanus — cc. (E.M. I. C.)	–	–	–	–	66	457	325	68	54.5
Diphtheria-tetanus-pertussis — cc.	–	–	–	–	–	–	–	–	1,435.5
Diphtheria-pertussis — vials (E.M.I.C.)	–	–	–	273	613	489	390	55	4
Purified Diphtheria Toxoid — cc.	–	–	–	–	–	–	–	–	1,422
Enteric Fevers									
Typhoid Vaccine — cc.	45,576	42,028	47,778	53,190	54,171	52,872	66,084	61,805	56,120
Typhoid-Paratyphoid B vaccine — cc.	34,377	63,424	40,528	32,966	22,689	15,929	28,611	44,485	7,179
Typhoid-Paratyphoid A and B vaccine — cc.	–	–	–	–	–	–	258	2,000	33,090
Measles									
Antibody globulin — cc.	–	5,720	22,375	39,390	14,260	–	–	–	–
Immune Serum Globulin — vials	–	1,090	600	195	3,462	25,230*	15,684*	35,001*	24,092*
Placental Extract — vials	2,666	3,553	3,077	1,544	30	–	–	–	–
Sodium Citrate Solution — vials	860	537	424	356	–	–	–	–	–
Meningitis									
Antimeningococcic Serum, 15 cc. doses	1,157	1,819	1,210	150	–	–	–	–	–
Antimeningococcic Serum, Conc. vials	51	2	–	439	90	–	–	–	–
Antihemophilus Type B Serum — vials	1,666	747	369	382	139	212	30	23	20
Antihemophilus Type B Serum — Bulk cc.	5,300	1,410	–	–	–	–	–	–	–
Pneumonia									
Antipneumococcic Serum, horse, Conc. vials	2,579	2,765	1,565	49	–	–	–	–	–
Antipneumococcic Serum, horse — Bulk cc.	1,450	–	–	–	1,925	–	–	–	–
Antipneumococcic Serum, rabbit, 20,000 u. vials	1,199	1,332	1,163	580	380	315	64	10	5
Antipneumococcic Serum, rabbit, 50,000 u. vials	–	46	97	96	4	–	–	–	–
Diagnostic Serums (of rabbit origin unless otherwise noted)									
Pneumococcus Type 1 — horse, cc.	7	–	60	25	–	–	–	–	–
Pneumococcus Type 2 — horse, cc.	–	–	60	25	–	–	–	–	–
Pneumococcus Type 3 — horse, cc.	7	–	50	70	5	–	–	–	–
Pneumococcus Type 1 — cc.	103	110	95	106	48	30	10	2	–
Pneumococcus Type 2 — cc.	92	106	83	115	50	33	12	9	1
Pneumococcus Type 3 — cc.	108	122	167	103	53	31	15	10	3
Pneumococcus Type 4 — cc.	53	62	56	57	47	34	12	7	1
Pneumococcus Type 5 — cc.	91	97	71	73	47	35	13	6	1
Pneumococcus Type 7 — cc.	91	92	68	74	48	32	13	7	2

*Furnished in part by the American Red Cross

Distribution of Products

	1941	1942	1943	1944	1945	1946	1947	1948	1949
Pneumonia (Continued)									
Pneumococcus Type 8 — cc.	130	90	71	71	45	31	14	8	1
Pneumococcus Type 14 — cc.	53	69	54	56	41	28	11	7	1
Pneumococcus, other types — cc.	796	615	487	497	525	227	93	37	15
Pneumococcus, Pool A — cc.	175	147	152	137	89	71	40	18	2
Pneumococcus, Pool B — cc.	178	140	165	143	90	73	42	19	3
Pneumococcus, Pool C — cc.	175	143	151	143	79	67	44	19	3
Pneumococcus, Pool D — cc.	163	139	166	138	80	73	39	18	2
Pneumococcus, Pool E — cc.	161	134	154	135	84	61	36	–	2
Pneumococcus, Pool F — cc.	162	138	155	139	85	68	39	17	2
Scarlet Fever									
S. F. Streptococcus Antitoxin, 9,000 u. vials	1,849	1,714	1,306	1,190	1,429	149	487	242	72
S.F. Streptococcus Toxin, 5 cc. vials	195	155	120	174	114	155	136	100	77
S.F. Streptococcus Toxin, Heated Control, 5 cc. vials	186	155	114	170	114	155	136	100	77
S.F. Streptococcus Toxoid, 1 cc. doses	3,618	1,845	2,040	2,100	2,025	1,560	1,245	495	–
S.F. Toxin — Bulk cc.	–	–	–	–	–	–	–	25	180
Smallpox									
Smallpox Vaccine, capillary tubes	220,638	229,135	209,541	215,917	201,117	220,589	227,944	263,262	265,684
Needles	49,430	43,110	44,160	39,580	41,440	46,520	59,220	66,710	65,960
Tetanus									
Toxoid — cc.	–	993	2,170	450	374	427	51	272	12,764*
Toxin — Bulk cc.	–	–	–	–	–	–	–	–	30
Tuberculosis									
Tuberculin, ampoules — 0.7 cc.	1,484	1,331	1,216	974	977	1,196	1,066	1,382	1,316
Tuberculin, capillary tubes	9,145	7,610	8,675	5,790	4,955	6,480	4,795	5,220	4,295
Tuberculin — Bulk cc.	–	–	3,500	3,500	–	30	–	–	–
Diluted Tuberculin — cc.	–	–	–	–	–	–	–	–	10.5
Gonorrheal Ophthalmia									
Silver Nitrate Solution, ampoules	88,800	95,096	95,556	90,564	87,884	106,740	121,900	114,664	123,232
Syphilis									
Arsphenamine, 0.4, 0.6 and 3.0 gm. ampoules	2,183	1,290	1,100	780	915	–	–	–	–
BAL	–	–	–	–	–	–	–	60	40
Bismith Salicylate in oil, 10 cc. bottles and 2 oz. bottles	6,414	7,168	5,595	6,680	5,743	4,465	3,636	2,376	1,583
Chlorarsen, vials of 0.045, 0.067, 0.45 and 0.67 gm.	–	–	–	30	–	1,534	2,390	1,990	750
Lygranum, 10 dose units	–	–	–	–	–	–	–	18	54
Mapharsen, 0.04, 0.06, 0.4 and 0.6 gm. amps.	39,234	52,540	47,746	49,243	40,110	35,800	28,570	17,080	10,399
Neoarsphenamine, 0.3, 0.45, 0.6 and 0.9 gm. amps.	36,861	30,744	25,235	19,267	12,208	6,615	5,375	2,833	720
Penicillin, vials of 100,000, 200,000, 300,000, 500,000 and 3,000,000 units	–	–	–	1,568	17,134	17,313	14,366	10,006	6,912

Phenarsine Hydrochloride, 0.045, 0.45, 0.068 and 0.68 gm. amps.	–	–	–	496	–	–	–	–	–
Sulfathiazole, tablets, contained in 40, 500 and 1000 tablet bottles	66,500	112,640	145,380	164,740	126,560	107,200	68,940	24,500	–
Sulpharsphenamine, 0.3, 0.6 and 3.0 gm. amps.	3,509	3,326	2,641	1,844	1,551	733	670	400	105
Syringe assemblies	–	–	–	–	–	–	13	9	6
Hypodermic needles	–	–	–	–	–	–	–	24	–
Tubex syringes	–	–	–	–	–	–	–	–	12
Transfusion Therapy									
Exchange blood — bottles	–	–	–	–	–	–	–	137	370
Whole Blood — Pint bottles — American Legion	–	–	–	–	–	491	642	136	–
Whole Blood — Pint bottles	–	–	–	–	–	2,508	12,986	21,091	23,883
Red Cells — Bottles of various sizes	–	–	–	–	–	36	24	134	591
Dried Human Plasma (O.C.D.) 250 cc. bottles	–	–	–	–	35	207	–	–	–
Dried Human Plasma (Red Cross) 250 cc. bottles	–	–	–	–	–	446	2,794	1,079	–
Dried Human Plasma (Red Cross) 500 cc. bottles	–	–	–	–	–	12,890	13,437	8,579	2,121
Normal Serum Albumin — cc. (O.S.R.D. study)	18,388.5	191,722	113,400	63,200	1,830	–	–	–	–
Normal Serum Albumin — 10 cc. bottles	–	–	–	–	–	–	41	–	–
Normal Serum Albumin — 20 cc. bottles	–	–	–	–	–	–	119	65	73
Normal Serum Albumin — 100 cc. bottles	–	–	–	–	–	–	148	573	728
Antihemophilic Protein (Dry) cc.	–	–	–	–	–	703	150	–	–
Antihemophilic Protein (Wet) cc.	–	–	–	–	–	1,656	–	–	–
Thrombin — vials	–	–	612	530	–	–	–	–	–
Hemostatic fibrin	–	–	28	41	–	–	–	–	–
Frozen Malarial Blood — cc.	–	–	–	–	–	–	–	–	107
Miscellaneous Other Products									
Botulinus toxoid — cc.	–	–	625	2,600	–	–	–	–	–
Defibrinated horse blood — cc.	303,850	386,940	366,165	376,125	398,780	338,215	384,350	404,985	428,390
Normal Horse Serum — cc.	73,150	57,170	93,750	111,440	105,650	82,800	62,200	53,950	50,040
Rocky Mt. Spotted Fever — Chick Embryo	–	–	–	–	–	–	8	–	1
Rocky Mt. Spotted Fever — Tick	–	–	–	–	–	–	2	–	–
Serum Sensitivity Outfits — Horse	798	616	506	345	465	540	721	565	549
Serum Sensitivity Outfits — Rabbit	60	689	648	–	5	12	–	–	–
Blood Culture Outfits	–	–	–	28	30	22	45	18	–
Antihuman Albumen Horse Serum — cc.	–	–	–	–	–	–	–	–	15,800
Whooping Cough									
Pertussis Vaccine — vials (E.M.I.C.)	–	–	–	65	243	504	349	64	9,958*

*Beginning of our own manufacture

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

Budgets	Appropriated Funds		Accounting Office Expenditures		A & V Lab. Expenditures	
	Personnel Services	Expenses	Personnel Services	Expenses	Personnel Services	Expenses
1941–1942						
4120–07 +Pneu. Control	$12,721.84	$14,068.86			$11,563.94	$12,467.68
2007–07	80.000.00	36,200.00			73,590.47	35,432.90
Dec. '42 to June '43 (7 mos.)						
2007–07	43,441.43	17,487.12		$16,844.43	43,441.43	16,753.18
1942–1943						
4120–07 + Pneu. Control	9,776.00				9,662.43	11,650.19
VD	866.25				866.25	
1943–1944						
2007–07	75,834.00	41.800.00	$76,445.15	37,904.41	76,433.54	37,837.76
4120–07+Pneu. Control	7,917.76	4,538.50			7,257.95	3,258.70
VD					1,163.35	
1944–1945						
2007–07	77,625.00	41,800.00	74,482.51	37.801.79	74,482.50	37,666.36
4120–07+Pneu. Control	7,264.00	25,004.20			6,489.25	24,902.36
VD					1,289.35	
1945–1946						
2007–07	82,700.00	40,000,00	81,362.22	37,538.07	81,359.25	37,533.53
4120–07	8,162.52	5,652.42			8,065.27	4,681.65
VD	1,010.00				1,010.83	
6160–01		3,676.12				3,676.12
2008–01	43,665.00	49,335.00	36,927.94	41,564.29	36,660.53	41,156.31
2008–02		23,223.39				23,223.39
Hyams Bldg.		191,000.00				
1946–1947						
2007–07	109,550.00	40,000.00	95,293.32	39,221.68	95,089.69	39,135.45
4120–07	10,113.44	12.586.56	10,015.74	7,458.48	10,015.74	11,880.50
VD	1,449.00				1,449.02	
6160–01	7,091.70	2,451.11			7,091.70	2,451.11
2008–12	117,000.00	60,000.00	102,810.27	58,026.61	102,532.07	56,277.35
2008–02		71,776.61				73,072.40
4120–50		2,770.58		2.770.58		
Blood Group Lab.	1,080.00					
R.C. Jaundice Study	5,850.00					
1947–1948						
2007–07	114,293.00	40,000.00	102,788.33	39,357.98	109,312.71	38,902.16
4120–07					12,522.28	1,110.80
VD	1,720.00				1,720.00	
6160–01	8,642.14	2,666.99			8,642.14	2.666,99
2008–11	135,360.00	70,000.00	103,420.94	66,668.67	108,229.98	67,030.97
2008–11 R.C.	32,000.00					
4120–50		28,708.42		22,915.53		
B.G.L.	9,910.00					
R. C. Jaundice	1,732.00					
1948–1949						
2007–07	117,180.00	36,525.00			107,097.37	33,183.32
4120–07					11,750.05	470.17
VD	1,740.00				1,740.00	
2008–11–00 Pilot	27,500.00	47,500.00			6,438.62	17.100.78
2008–11	89,000.00	37,215.00			58,475.66	31,802.19
2008–11–99		6,090.39				3,891.57
2008–11–W.B.	68,000.00	41,262.00			33,100.24	14,274.74
2008–11–Rx)					10,440.95	5,168.60
6160–01	10,072.95	4,855.88			10,072.95	4,855.88
B.G.L.	1,680.00					
U. S. Army Study	5,000.00					

If no figures appear under the heading "Accounting Office — Personnel Services or Expenses," it is because the Laboratory did not receive a final statement of appropriation and expense for that year.

DIVISION OF DENTAL HEALTH
CONSOLIDATED REPORT 1946–1949

William D. Wellock, D.M.D., M.P.H., *Director*

General Statement

The Dental Division was established July 1, 1946, and has been taking the fundamental steps necessary to accomplish its primary objective — the prevention and control of tooth decay. During this period the knowledge of when, where and under what conditions this most common disease occurs has been observed and recorded for the first time in the history of the Commonwealth. Extensive research and epidemiological studies have been made. These activities have played no little part in helping to educate the public and profession. In this short time, an intense interest has been aroused in most communities to attack this problem at its inception in childhood by the formation of local dental health programs for pre-school and school children. Programs resulting from this interest are, at this date, as extensive as can be found in the nation.

The beginnings of a preventive program have been made by the demonstration of recommended dental techniques and their resultant adaptation to the care programs.

Dental Division

The objectives of the Dental Division are to conduct or stimulate research designed to reduce the present caries prevalence and concurrently to stimulate adequate care programs to ameliorate the existing conditions.

Although great strides have been made in the development of preventive measures, tooth decay remains a vexatious problem which must be conquered during childhood and adolescence if control is to be achieved. At the date of present observations, preventive methods are new and cumbersome, and control methods by means of care programs inadequate, yet the latter represents one of the greatest efforts of any state in the nation.

In the Division's history, no observation of a geographical differentiation has been made on the incidence of caries in children of the Commonwealth. Because of the newness of preventive measures, no significant results of their use have, as yet, been observed.

Representative state-wide dental findings in school children are attached.

Average Number of Decayed and Filled *Deciduous* Teeth per Child By Age in Eleven Representative Massachusetts Communities 1950

Age	Number of Cases	Number of Decayed Teeth Per Child	Number of Filled Teeth Per Child	Number of df Teeth Per Child
5	80	3.52	.64	4.16
6	556	4.83	.52	5.35
7	594	4.44	.82	5.26
8	521	4.43	.75	5.18
9	490	3.59	.67	4.26
10	476	2.68	.41	3.09
11	489	1.37	.19	1.56
12	383	.52	.06	.58
13	321	.23	.03	.26
14	214	.08	.00	.08
15	122	.08	.00	.08
16	92	.05	.05	.10
17	51	.01	.00	.01
18	15	.00	.00	.00
19	3	.00	.00	.00
Total	4407			

Average Number of Decayed, Missing and Filled *Permanent* Teeth per Child by Age

in Thirteen Representative Massachusetts Communities
1950

Age	Number of Cases	Decayed Teeth Per Child	Missing Teeth Per Child	Filled Teeth Per Child	DMF Teeth Per Child
5	80	.07	.00	.00	.07
6	556	1.21	.00	.05	1.26
7	594	1.91	.00	.20	2.11
8	521	2.51	.04	.48	3.03
9	506	2.81	.08	.71	3.60
10	505	3.37	.14	.99	4.50
11	524	4.27	.29	1.48	6.04
12	410	5.50	.37	1.73	7.60
13	373	6.31	.62	2.26	9.19
14	264	7.29	.90	2.50	10.69
15	198	7.26	.85	2.85	10.96
16	145	6.89	1.10	4.78	12.77
17	98	7.42	1.37	4.50	13.29
18	31	9.00	1.70	3.93	14.63
Total	4805				

Findings Made During Topical Fluoride Demonstration

in Ten Massachusetts Communities
1949

Age	Per Cent of Children with Evidence of Caries Experience in Permanent Teeth	Per Cent of Children with Evidence of Some Successful Operative Dentistry on Permanent Teeth	Per Cent of Children with Evidence of Some Successful Operative Dentistry on Deciduous Teeth	Missing Permanent Teeth		Per Cent of Children in Need of Operative Dental Care at Time of Examination
				No. of Missing Teeth per Child Having Missing Teeth	Per Cent of Children Having at Least One Missing Permanent Tooth	
6	36.	4.	23.	1..	1.3	55.
7	72.	11.	26.	1.4	3.2	71.
8	85.	21.	18.	1.9	7.3	85.
9	90.	31.	25.	1.5	10.6	72.
10	95.	39.	14.	1.8	16.9	77.
11	97.	36.	7.	1.9	28.3	85.
12	98.	51.	2.	2.1	41.9	77.
13	100.	49.	1.	2.2	53.5	78.
14	98.	55.	0.	2.6	55.5	73.
15	97.	55.	0.	3.3	60.0	68.
16	100.	50.	0.	3.1	66.7	75.

DIVISION OF HOSPITALS
CONSOLIDATED REPORT 1942–1949

Richard P. MacKnight, M.D., *Director*

Chapter 111 of the General Laws, Section 71 to 73 inclusive as amended by Chapter 661 of the Acts of 1941, authorizing the licensing of hospitals and sanatoria by the Department of Public Health, was passed by the Legislature in 1941 and approved on October 20, 1941.

This function was placed in the Bureau of Hospital Licensing in the Division of Administration under the direct supervision of the Commissioner and began to function as such on June 1, 1942. The Bureau personnel consisted of a physician, the Superintendent of Hospital Inspection, a registered nurse, the Hospital Inspector and a junior clerk.

In accordance with the provisions of the Act, an Advisory Committee on Hospitals and Sanatoria was appointed to suggest standards and policies for the administration of the program. Prior to the effective date of the licensing law, this Committee, together with representatives of the Department and other advisors, prepared the Hospital Standards which included the classification of hospitals and sanatoria and minimum regulations for the conduct of the licensing program. These Standards were approved and adopted by the Department on April 14, 1942, amended on February 9, 1943 and December 14, 1943. At the present time we are revising these Standards. The revised Standards will become effective July 1, 1950.

During the first year of the program, ten hospitals converted into nursing homes and five closed because of their inability to meet minimum standards. By January 1, 1944, 170 of the 186 hospitals existing at that time were licensed for two years as specified in the statute.

As our program progressed we were frequently called upon to assist Hospital Administrators and Trustees with their problems chiefly in relation to administration, medical and nursing staff organization and medical records.

In 1944, the inspection and licensing of clinics and dispensaries was transferred from the Division of Communicable Diseases (District Health Officers) to the bureau of hospital licensing.

In September 1945, Chapter 661 of the Acts of 1941 was amended by Chapter 527 of the Acts of 1945. This provided for the issuance of a certificate of inspection by a building inspector in the Department of Public Safety for each hospital licensed. This transfer of the responsibility for the safety and fire protection from the bureau of licensing was enthusiastically received by the Department and greatly strengthened the relationships between the Departments of Public Safety and Health.

In December 1945, the first plans for Survey of Hospitals under the guidance of the Commission on Hospital Care was initiated with the temporary appointment of a Director of Survey (a physician) who officiated in that capacity until the middle of July 1946.

In the latter part of June 1946, the first outbreak of Infectious Diarrhea of the Newborn occurred in one of our licensed hospitals necessitating the closing of their maternity service. Again in October 1946, a large number of cases developed in a hospital in the same community. Their obstetrical service was closed from November 7, 1946 to February 21, 1947.

In the Metropolitan area explosive outbreaks in seven other institutions occurred and less serious outbreaks in five additional hospitals, almost simultaneously.

It is difficult to estimate the exact number of deaths or even the number of cases during this series of outbreaks, but there were well over 70 deaths of newborn infants. In each instance, sometimes voluntarily and sometimes acting on the advice of the Department, obstetrical admissions ceased and the service was not reopened until all of the recommendations of the Department, including a rigid cleaning up process and revision of medical and nursing techniques had been complied with. The purchase of new equipment was necessary and in some instances structural changes had to be effected.

In general, it was apparent that overcrowded nurseries. inadequate physical facilities and equipment, sanitary hazards. poor techniques and acute shortages of qualified personnel, particularly graduate nurse supervision for the twenty-four hour period, were contributing factors.

It was a well-known fact that the increased number of hospital deliveries had created unforeseen demands on the institutions, but the expansion of hospital facilities and personnel necessitated by this increase had not kept pace.

As a result of these epidemics it was realized that drastic reorganization of the maternity services throughout the Commonwealth was necessary, which was initiated.

It is noteworthy that there have been no infant deaths from infectious diarrhea of the newborn in hospitals with maternity services licensed by the Department of Public Health from July 1947 to date; but there was one death in May, 1948, that occurred in an institution not under the jurisdiction of the Department of Public Health.

During the period from July, 1947, to date there were 32 suspicious episodes reported to the Bureau of Hospital Licensing with no resulting deaths. This unquestionably was due to the wholehearted cooperation which exists between the Licensing Bureau, Hospital administrators, local boards of health and the Director of the Division of Communicable Disease. Other influencing factors included conferences with pediatricians, obstetricians, trustees and maternity and pediatric nursing supervisors to interpret Department policies and to assist in the establishment of safe procedures and techniques and the development of proper facilities.

It would seem proper at this time to mention the "Institutes on Infectious Diarrhea of the Newborn" which were really a result of the shocking outbreaks and were held the latter part of May and early in June 1947 in Springfield, Salem, New Bedford and Boston. A hearty response to these Institutes was manifested by the attendance and extreme general interest.

Through the cooperation of the Divisions of Maternal and Child Health and Communicable Diseases, the proceedings of the Institute was published and forwarded to all licensed hospitals in May, 1949.

The responsibility assumed by the Department with the enactment of Chapter 618 of the Acts of 1948 can be best judged when it is known that there are 871 nursing and convalescent homes and boarding homes for the aged throughout the state. This figure includes 137 charitably incorporated homes which became subject to licensure by the repeal of Section 22A of Chapter 121 of the General Laws which had exempted the charitably incorporated group. To date 255 convalescent and nursing homes and 289 boarding homes for the aged have been licensed by the Department.

Chapter 618 of the Acts of 1948 also includes the licensing of homes conducted by the body known as the Church of Christ Scientist which were previously exempt. However, such homes are not subject to inspection by the Department except for sanitation although all other requirements for the issuance of a license must be met.

In accordance with the provisions of the Act after a public hearing, rules and regulations were established under authority of the General Laws, Chapter 111, Section 71 to 73 inclusive as amended by Chapter 618 of the Acts of 1948 which provided for the licensing of convalescent and nursing homes and boarding homes for the aged as part of the existing program for the licensing of hospitals and sanatoria. The rules and regulations for the licensing of convalescent and nursing homes and boarding homes for the aged were approved and adopted at a meeting of the Department on November 3, 1948.

The licensing program for convalescent and nursing homes and boarding homes for the aged was organized to function through the district health officers in an endeavor to provide a more efficient service, but with no additional appropriation for the necessary personnel, travel and equipment the program has been seriously handicapped from the onset. In fact, in order to initiate this program it was necessary to effect the transfer of four temporary employees from the Department of Public Welfare. The Department of Public Welfare also transferred funds for their salaries for the first year. A further handicap arose when one of the inspectors resigned in October 1948. We now have six districts covered by three inspectors and no provision for this service in the North and South Central Districts.

Previous to June 1948 no Department policy had been effected relative to the licensing of sanatoria for non-committable psychiatric individuals. This situation created a controversial issue since June 1942 because, according to the General Laws, Chapter 123, the Department of Mental Health had no authority to license institutions that did not commit patients. In agreement with the Department of Mental

Health and the Department of Public Health, the first two of these institutions were licensed on June 14, 1948. Since that date, three other similar sanatoria have been licensed by the Department and we will continue to do so since this procedure has become an established policy.

The Hospital Standards were completely revised in 1949. This project entailed a tremendous amount of time and effort. In the compilation of these Standards, the Bureau has worked closely with the Advisory Committee, the State Academy of Pediatrics, Hospital Administrators, Obstetricians and Surgeons. The Director of the Division of Communicable Disease, the Director of Maternal and Child Health and the Director of the Division of Sanitary Engineering, also rendered valuable assistance.

The Committee on Maternal Welfare of the Massachusetts Medical Society in cooperation with the Division of Maternal and Child Health and the Division of Hospitals began a five year study of maternal deaths in Massachusetts in January, 1949.

Other important contributions were the assistance given by the Division in the preparation of the "Standards and Recommendations for the Hospital Care of Newborn Infants" by the American Academy of Pediatrics. Also we worked closely with the National and State Committee for the improvement of child health.

Interstate communications have increased and there were many visitors as well as an increased number of requests from other states seeking information on our licensing program.

From an interdepartmental level we continue to work in excellent cooperation with the Department of Public Safety, the Department of Public Welfare and the Department of Mental Health.

We are very appreciative of the excellent relationship that exists between the division of Hospitals and the following: The Massachusetts Medical Society, Massachusetts Hospital Association, Hospital Council of Boston, Massachusetts Hospital Service Inc., American Hospital Association, American Medical Association, American College of Surgeons, Massachusetts Federation of Nursing Homes Inc, the local boards of health, and the Boards of Registration in Medicine and Nursing.

Looking ahead we are somewhat encouraged by the prospects of the appointment of four permanent hospital inspectors. However, we realize that the minimum personnel requirements to effectively carry out the functions of the program require that one inspector be assigned to each district except the North Metropolitan Health District which needs at least two inspectors. This is a very conservative requirement when one considers that there are seventy-five hospitals, 128 clinics and dispensaries, 138 convalescent and nursing homes and 132 boarding homes for the aged in the latter district.

We are also cognizant of the fact that only a fraction of the existing industrial clinics and dispensaries and school and college infirmaries throughout the Commonwealth have been licensed because of insufficient personnel to make the necessary inspections.

Because of the tremendous hospital building program underway, hospital visits and conferences with architects, administrators and trustees have greatly increased. This burden will be intensified when the final revision of the Hospital Standards becomes available.

For this project to function satisfactorily due thought and consideration must be given to the need of increased personnel for supervisory, field and clerical activities.

We must plan and execute an intensive in-service training program.

General Summary

Forty New Hospitals Have Been Licensed Since 1944

1944	11
1945	1
1946	3
1947	4
1948	16
1949	5

Number of Hospitals Closed Totaled Thirty

1943	10
1944	0
1945	1
1946	7
1947	6
1948	5
1949	1

All of these institutions closed voluntarily except two whose licenses were revoked by action of the Department following public hearings in 1947 and 1948.

At the present time there are 197 licensed hospitals.

DEPARTMENT OF PUBLIC HEALTH
Division of Hospitals
197 Licensed Hospitals

Type of Service		*Groups*	
General without Maternity Service	14	Group A 1–49 beds	74
General with Maternity	131	B 50–149 beds	79
Maternity	6	C 150 plus	44
Tuberculosis and Isolation	14		
Other	32		
School and College Infirmary	9		
Pediatric	9		
Chronic Disease	5		
San. Nervous Disorders	5		
Rectal Surgery	1		
Gynecology	1		
Nose and Throat	2		

DEPARTMENT OF PUBLIC HEALTH
Division of Hospitals

District	Licensed Hospital or Sanatoria*	Licensed Clinic or Dispensary**
Southeastern	18	2
South Metropolitan	15	4
North Metropolitan	75	28
Northeastern	29	5
South Central	16	3
North Central	16	2
Connecticut Valley	19	4
Berkshire	9	0
	197	48

*Federal, state and county institutions, municipal infirmaries and institutions licensed by or under the supervision of the Department of Mental Health are not included.

**Includes dental clinics.

DEPARTMENT OF PUBLIC HEALTH
Division of Hospitals

District	Licensed Nursing and Convalescent Homes	Unlicensed Nursing and Convalescent Homes	Licensed Boarding Homes for Aged	Unlicensed Boarding Homes for Aged	Total
Southeastern	22	14	37	13	86
South Metropolitan	46	12	53	19	130
North Metropolitan	88	50	49	83	270
Northeastern	47	18	71	67	203
South Central	8	5	31	9	53
North Central	15	8	9	19	51
Connecticut Valley	23	0	25	10	58
Berkshire	6	0	14	0	20
8	255	107	289	220	871

BUREAU OF HOSPITAL SURVEY AND CONSTRUCTION CONSOLIDATED REPORT 1946–1949

A. Daniel Rubenstein, M.D., M.P.H., *Director*

Although preliminary steps had been taken prior to this fiscal year to obtain hospital survey and construction data throughout the state, the Bureau of Hospital Survey and Construction owed its origin to the enactment of Public Law 725 of the 79th Congress on August 13, 1946 which provided assistance to the various states to survey the need for construction of hospitals and to develop programs for construction of such public and other non-profit hospitals that in conjunction with existing facilities would furnish adequate hospital, clinic and similar services to all the people of the state.

During the early month of the fiscal year beginning July 1, 1947, the work of this Bureau was concerned mainly with the preparation of the State Plan for the administration of Public Law 725 — the Hospital Survey and Construction Act. The Massachusetts State Plan was completed several months ahead of schedule at the request of the Surgeon General of the United States Public Health Service and was forwarded to Washington, D. C. on October 13, 1947. The State Plan, in accordance with the regulations pertaining to Public Law 725, was presented to and unanimously approved by the State Advisory Council on November 5th. Also in keeping with the law, a public hearing was held in the Gardner Auditorium, State House, one week later, November 12th. Hospital administrators and trustees and all interested persons were invited to attend the meeting at which Dr. Getting and staff members presented a symposium on the State Plan. On November 18th, the Plan was approved by the Public Health Council, and immediately after was sent to the Surgeon General in its final approvable form. This approval was given on December 2, 1947.

Following approval of the Plan, applications were solicited from general hospitals in areas receiving an A priority, from all hospitals in Massachusetts for chronic disease projects and from all local boards of health for public health center projects.

The second meeting of the State Advisory Council was held on January 12, 1948 at which time the first approval was given to an application for Federal funds. This was the Glover Memorial Hospital in Needham. On the following day, the Public Health Council approved the application, and on February 10th, the United States Public Health Service gave their approval.

During these first months of the fiscal year, a new study was developed with the cooperation of the Massachusetts Department of Public Safety. The original State Plan listed as acceptable facilities all hospitals licensed by the Commonwealth, regardless of type of construction. (Table 1 and Table 2.)

Table 1. — *Distribution of Hospitals by Type*

Type	Total Number Hospitals	Beds*	
General	147	16,968	
Maternity	6	379	
Contagious	6	564	
Other special	12	1,267	
Subtotals of general and allied special	171		19,178
Tuberculosis	20		3,299
Nervous and mental	24		21,050
Chronic and convalescent	4		517
Grand Total	219		44,044

*The figures referring to number of beds indicate the normal bed capacity — that is, the number of beds for which the hospital was built. In many instances because of overcrowding, this figure is smaller than the actual number of beds in use for inpatient care (complement).

TABLE 2. — *Distribution of General Hospitals by Size*

Size	Total Number Hospitals	Beds*
Less than 25 beds	23	436
25–49 beds	32	1,113
50–99 beds	37	2,460
100–249 beds	44	7,178
250–499 beds	8	2,597
More than 500 beds	3	3,184
Totals	147	16,968

*The figures referring to number of beds indicate the normal bed capacity — that is, number of beds for which the hospital was built. In many instances because of overcrowding, this figure is smaller than the actual number of beds in use for inpatient care (complement).

It was known that many hospital buildings were obsolete, or even hazardous to public safety. With this in mind, Public Safety inspectors visited each hospital viewing it from the aspects of type of construction and means of fire prevention and control. Members of the staff also visited for a preliminary study certain areas with hospital facilities of frame construction. As a result, at a State Advisory Council Meeting on April 8, 1948, these areas were reclassified to an A priority on the basis of non-acceptable Class VI wood frame construction. Following this reclassification, the Council approved applications for Federal funds for two hospitals — the Emerson Hospital, Concord, and the Clinton Hospital, Clinton. At the same meeting, approval was given to an application for the first chronic disease project at the Children's Hospital, Boston, and for a general hospital project, the Lawrence Memorial Hospital, Medford. Funds for this last project were to be taken from the 1949 Federal allocation.

During the fiscal year, therefore, five projects were approved by the State Agency and the United States Public Health Service. Four were in the general hospital category, and the fifth a chronic disease project. The first application approved, that of Needham, was subsequently processed with such dispatch that construction was begun on June 14, 1948, the first project in Massachusetts under Federal assistance.

On June 21, 1948, an interim revision of the Massachusetts State Plan was approved by the United States Public Health Service. The important changes were the reclassification of areas mentioned above and the formation of a new rural area in the Town of Milton.

Other events occurring during the year 1947–1948 were an in-service training course given jointly by the Department and the Massachusetts Hospital Association in the form of eight seminar lectures on Hospital Administration; a comprehensive study of patient distribution data collected from all general hospitals in Massachusetts; and supplementing the reports of the Department of Public Safety, members of the staff began visits to all the hospitals in Massachusetts to determine the physical facilities available. Based upon these studies, a complete revision of the State Plan was contemplated for the second fiscal year of the program.

The primary consideration of the Bureau during the fiscal year 1948–1949 with regard to survey activities was the preparation of the annual revision of the Massachusetts State Plan for the administration of Public Law 725. This revision was based on two major reclassifications of the general hospital facilities in Massachusetts. Our primary concern was the status of the general hospital with regard to three items: 1. Type of construction, that is fire-proof or non fire-proof; 2. The adequacies of ancilary services, such as operating rooms, delivery suites, etc.; 3. The normal capacity of the hospital, that is the number of beds for which the hospital was built. Since the only data available were from the Schedules of Information filled out by hospitals in 1946 or 1947, it became necessary to visit each general hospital to determine these factors. Table 3 shows the non-acceptable beds in general hospitals as determined by this study.

TABLE 3. — *Acceptable and Non-acceptable Beds by Type of Area*

Type of Area	Number of Hospitals	Total Beds	Acceptable Beds	Per Cent Acceptable Beds	Non-Acceptable Beds	Per Cent Non-Acceptable Beds	Total Beds Needed	Per Cent Need Met
Base . .	50	9,374	7,474	80%	1,900	20%	10,481	71%
Intermediate	91	7,600	4,742	62%	2,858	38%	11,468	41%
Rural . .	21	967	713	74%	254	26%	994	72%
Total .	162	17,941	12,929	72%	5,012	28%	22,943	56%

Subsequently during the year a team of workers consisting of a physician and an engineer visited all of the general hospitals in the Commonwealth. The second major item considered in the revision of the State Plan was the use of general hospitals as determined by patient flow data. On the basis of this use the State was redistricted and new general hospital service areas delineated.

Upon completion of these two reclassifications the first annual revision was prepared and subsequently approved on March 2, 1949 by the State Advisory and Public Health Councils. Later it was submitted and subsequently approved by the Surgeon General of the U. S. Public Health Service on June 2, 1949. The revision of the Plan also included an addendum concerned with the necessity for assisting teaching hospitals in base areas. Since most base areas, especially that of Boston, had a low priority even upon revision of the Plan, it was decided by the Advisory Council, and subsequently approved by the Surgeon General, that any teaching hospital fulfilling certain criteria could be given an A priority and thereby would be eligible for federal assistance under Public Law 725. The criteria were as follows:

1. The hospital must be intimately associated with a medical school as a teaching facility for undergraduate and graduate medical education.
2. Facilities must be available in the hospital for training in at least two specialties.
3. Post-graduate courses should be given for general practitioners or specialists.
4. The hospital must be an integral and organized part of an existing or proposed medical center.
5. The teaching center, upon completion of the proposed project, shall be able either to instruct a larger number of graduate and post-graduate students, or to give more extensive and longer courses or demonstrate satisfactorily that its teaching facilities will be of greater use to the medical schools.

As to the construction activities of the Bureau, four State Advisory Council meetings were held during the fiscal year on August 5, December 15, March 2, and April 29, at which times several projects were given approval for federal assistance under Public Law 725. The approved projects include one chronic disease addition at the Cape Cod Hospital, Hyannis; eight general hospital projects at Milton Hospital; Wing Memorial Hospital, Palmer; Marlboro Hospital; Brockton Hospital; St. Luke's Hospital, New Bedford; Community Memorial Hospital, Ayer; Mary Lane Hospital, Ware; and Bon Secours Hospital, Methuen (equipment only). One Public Health Center was given approval for the City of Quincy. Two projects which fell into the category of teaching hospital in Boston were approved; one at the Massachusetts Eye and Ear Infirmary, and the second at the Beth Israel Hospital (equipment only). In addition to these projects, of the six projects given approval during the last fiscal year, one project at the Glover Memorial Hospital, Needham is nearing completion, and four others were in the process of construction. Table 4 indicates all projects approved under Public Law 725.

TABLE 4. — *Summary of Projects Approved Under Public Law 725*

TYPE OF PROJECT	NO. OF PROJECTS	NO. OF BEDS ADDED
General Hospital	20	1197
Chronic Hospital	4	638
Public Health Center	1	–
Total	25	1835

DIVISION OF FOOD AND DRUGS
CONSOLIDATED REPORT 1942–1949

Carl S. Ferguson, B.S., *Director*

The Food and Drug Division during the years 1942–1949 has been engaged in the usual routine work relative to the enforcement of the laws pertaining to the sale of milk, foods and drugs; the slaughtering laws; the cold storage laws; bakery laws; the frozen dessert laws; the laws pertaining to the pasteurization of milk; the laws pertaining to the bottling of carbonated non-alcoholic beverages; certain phases of the narcotic law; the law pertaining to the sale of wood alcohol; the laws pertaining to the sale of articles of bedding and upholstered furniture; and the examination of liquors, chemicals, etc. for Police Departments.

In addition to the routine work in the enforcement of the above laws, the following details have demanded our attention during this period.

Poultry Fat — Investigations had shown that the quality of poultry fat as sold on the Massachusetts market was definitely below standard, containing varied degrees of rancidity and foreign matter. In cooperation with the inspectors of the Boston Health Department and members of the U. S. Food and Drug Administration, an investigation was conducted which showed excessive contamination and rancidity in various samples collected. This investigation led to considerable improvement in the handling of poultry fat from a sanitary viewpoint, so that the undesirable conditions were eliminated.

Adulterated Coffee — Due to the shortages of coffee incurred during this period, it was found upon analysis that a certain portion of the coffee supply was adulterated, in that the coffee was being mixed with cheap substitutes. Constant offenders were prosecuted in 1943, twenty-eight complaints being entered in the courts, with convictions in twenty-six instances. The following year the adulteration of coffee was insignificant.

Locker Plants — An increase in locker plants became evident in 1943, which necessitated a change in the cold storage law. The desired change became effective in 1944 and subjected the locker plants to the general cold storage law but exempted the plants as to the monthly report requirement and the placing of the date of original storage upon foods going into the lockers. Consent of the Department is not required in case a storage period longer than twelve months is desired by the owners of the food held in the lockers.

Prosecutions — Several unusual prosecutions which resulted in high penalties occurred during this period. In one instance, it involved the attempted bribery of an inspector and the other involved highly unsanitary conditions in a jam factory, the penalties being $100.00 and $500.00, respectively.

Slaughtering — In 1943, a significant change was made in the slaughtering law which gave the Department the authority to close a slaughterhouse licensed by a town board of health when found to be operated in an unsanitary condition.

In 1944, an increase in the number of slaughtering violations was noted, probably due to the shortage of meat.

In 1946, regulations were adopted under the provisions of Chapter 679 of the Acts of 1945 which pertained to poultry slaughterhouses. A full-time inspector was appointed and assigned to the routine inspection of poultry slaughtering establishments. By the end of 1946, copies of 292 poultry slaughtering license applications had been received and of this number 165 licenses were issued, following a total of 637 inspections. In most cases, joint inspections were made with the local authorities, and their assistance had been enlisted in carrying out changes which were necessary to bring the slaughterhouses in full compliance with the regulations. Since that time, a great degree of improvement has been observed in the sanitary condition of poultry slaughterhouses.

Dairy Farm Work — The quality of the milk on dairy farms in 1944 was still poor due to the lack of farm help and the inability of the owner to spend the necessary time required to keep the equipment cleaned.

In 1946 a decided improvement in the quality of raw milk for pasteurization purposes was noticed. This was due to the special attention given to the dairy farms in the past years. The major causes for the unsanitary conditions in dairy farms are listed below.

Causes	1946 No.	1946 % of Total	1944 No.	1944 % of Total	1943 No.	1943 % of Total
Inadequate cooling	23	22.4	49	19.1	131	39.7
Dirty milking machines	55	53.4	107	41.8	113	34.2
Other dirty utensils	10	9.7	76	29.7	54	16.3
Repeated use of cloth strainer	2	1.9	24	9.4	9	2.7
Dirty milking cans	9	8.7	5	2.0	–	–
Miscellaneous causes	4	3.9	Not compiled		16	4.8

Pasteurization Plants — In 1946, the use of the high-temperature, short-time pasteurization method offered the problem of performing efficiency tests on this equipment. The task of performing these tests was undertaken with the assistance of sanitarians of the U. S. Public Health Service. At that time, there were approximately thirty plants with this high-temperature equipment. This method of pasteurization is apparently eliminating many of the sources of contamination which formerly existed as a result of open exposure of the milk during pasteurization or during the subsequent operations of cooling and bottling. Complete protection from air contamination is possible by the high-temperature, short-time pasteurization method.

Emergency Milk — Emergency milk from the mid-West originating upon uninspected dairy farms was received during November and December of 1946. This "emergency milk" was necessary to relieve a threatened shortage and was legalized by the Milk Regulation Board through permits which were issued by the Director of Dairying of the Department of Agriculture. Examination of this milk upon arrival indicated that much of it was of inferior quality before shipment and a number of lots were also found to have been flash pasteurized. Standard plate counts were obtained upon certain shipments and were found to exceed several million colonies per cc.

In 1947, "emergency milk" was again necessary and was shipped into Massachusetts from great distances. Examination of as many lots as possible indicated that there was an improvement in the quality of this milk received during the previous year. This improvement may be noted by the following:

	Standard Plate Count	
	Original Sample Count	Count After Laboratory Pasteurization
8 shipments in 1946	1,100,000	280,000
11 shipments in 1947	470,000	21,000

The Food and Drug Division has attempted to require of this "emergency milk" a quality as nearly as possible approaching that of our normal supply. Following recommendations, the Department of Agriculture has been quick to respond with the revocation of several "emergency" permits. In our opinion, it is possible for "emergency milk" of a satisfactory quality upon arrival to be supplied from the Middle West. The examination of three shipments would seem to indicate this.

Shipment Number	Standard Plate Count	
	Original Raw Count	Count After Laboratory Pasteurization
1	460,000	13,000
2	93,000	3,000
3	290,000	12,000

The phospatase test upon each of these shipments was positive, indicating that the milk had not been previously heated.

Research Conducted on Vitamin A Deterioration in Oleomargarine — In 1944 and continuing through 1945, research work was started to determine the deterioration of Vitamin A in oleomargarine during storage. A lot of oleomargarine was purchased and half of the lot was stored in a commercial storage warehouse and the other half in a laboratory refrigerator. Samples were examined from each lot at regular intervals over a one-year period. The examination consisted of assay of the Vitamin A content and tests for rancidity development. The portion stored in the laboratory refrigerator lost nearly half of the Vitamin A potency during the year and developed rancidity as evidenced by a high peroxide number. A tallowy taste had also developed. The portion left in the commercial warehouse lost about 35% of its original Vitamin A during the year and retained its original flavor through the period, although there was some chemical evidence of slight rancidity near the close of the period.

Drug Stores — During the routine checks on prescriptions filled by drug stores chosen at random, it was found that there was much to be desired in the accuracy of compound prescriptions. Of 41 samples of prescriptions of percentage solutions, 5 were found to contain much less than the specified concentrations.

It was also found that retail druggists were not complying with the provisions of the U. S. Pharmacopoeia in keeping certain biological products under proper refrigeration. We used insulin preparation as the basis of our investigations and found only 15 out of 51 retail drug stores keeping this preparation under refrigeration as required.

Further study was given to the deterioration of thiamin hydrochloride as sold in tablets by retail druggists. It was determined that many of the samples had deteriorated by reason of long standing upon the retailers' shelves. This does not involve the manufacturer who has been found to prepare his product with at least a 10% addition above the specified concentration but who has been reluctant to date his package although he has assumed that it would be sold within two years of the time of manufacture. The rate of deterioration has been found to be approximately 15% a year. Retail drug stores, in general, have failed to take this problem of deterioration into account.

It has been noted that certain drug manufacturers are now dating their vitamin products. The problem of low-potency vitamin products appears to be largely one of systematic handling and rapid turnover in the retail store. During the past year, ten samples of thiamine hydrochloride tablets were assayed in the laboratory when received and again approximately a year later. The results as shown by the respective assays in terms of percentage of labeled potency are as follows:

	Original Assay	Approximately One Year Later
Sample 1	97.5	86.2
" 2	98.1	97.5
" 3	90.4	90.4
" 4	98.5	97.5
" 5	103.0	86.9
" 6	84.3	80.0
" 7	99.0	95.2
" 8	99.0	91.7
" 9	87.7	86.5
" 10	88.1	87.3

These results would indicate that there is no great amount of deterioration during the first year.

Mineral Oil in Food — The year 1945 saw the entrance upon the market of foods such as salad dressings and salad oil containing mineral oil. The use of mineral oil in place of vegetable oils occasioned the undertaking of research in the Westfield Laboratory which confirmed the fact that mineral oil in foods prevented the utilization by the body of oil soluble vitamins present in other foods. A salad dressing which had been previously fortified with additional Vitamins A and D beyond the saturation point of their solubility in mineral oil was fed to experimental rat colonies which had been made nutritionally deficient in these vitamins. It was determined that even though these vitamins were present in excess in a food containing mineral oil, they were still not utilized to the point of correcting the nutritional deficiencies.

Vitamin Laboratory in Westfield — The growth of the vitamin laboratory has been especially satisfactory, and a regular breeding schedule has been developed, which has resulted in a sufficient number of rats to perpetuate the breeding colony. This laboratory is now used for the routine check on Vitamin D milk samples and Vitamin A capsules which have been sorted out by general spectrophotometric analysis. The vitamin laboratory has matured to a point where it is now a full fledged arm of our laboratory facilities.

Legislation — Several important pieces of legislation were enacted during the 1948 legislative session.

Chapter 598 of the Acts of 1948 amended the sections of the law pertaining to the adulteration and misbranding of foods and drugs and contains important provisions which will bring our Massachusetts law into closer agreement with the Federal Food, Drug and Cosmetic Act. The provisions relative to seizure and relative to the distribution of harmful drugs are especially important.

Chapter 444 makes compulsory the enrichment of white bread and rolls with certain vitamin and mineral constituents.

Chapter 473 limits the retail sale of medicinal preparations containing small quantities of narcotic drugs to licensed drug stores.

Chapter 189 requires that restaurants, hotels and the like notify patrons whenever horsemeat is being served.

Chapter 453 removes certain restrictions upon hotels and restaurants serving oleomargarine and also permits the manufacture and sale of oleomargarine colored to look like butter. Whether the latter amendment will result in increased frauds remains to be seen.

During 1947, the slaughtering of horses was on the increase due to the high cost of beef. Many of these horses were shipped from the West for the purpose of slaughter. There was a limited amount of substitution of horsemeat for beef, but most of the horsemeat was used in the manufacture of animal food, or if purchased fresh, by the operators of mink farms and for the use as food for raising dogs. In 1949 a change in the slaughtering law was instituted, because it was felt that much of the uninspected horsemeat coming into this Commonwealth under the guise of "animal food only" was being diverted upon arrival for use as human food. The law stated that all meat intended for food purposes, whether for man or animal, shipped into the Commonwealth must have been derived from animals inspected, passed and stamped by the U. S. Bureau of Animal Industry. This will give added protection to those who desire to purchase horsemeat for human consumption. Of the total of 97,066 animals that were slaughtered in Massachusetts in 1949, 4,027 were horses.

During the 1948–1949 period, legislation was proposed, which, if enacted, would have resulted in better control over cream sold in Massachusetts. Most of our cream is shipped from distant points to our Massachusetts market, and originates from uninspected dairy farms. As a result, exceedingly high bacterial counts have been noted upon cream, and the measures for controlling these counts have been inadequate. The proposed legislation, which would have materially improved our cream, was referred to the next annual session.

During the same period mentioned directly above, legislation proposed by the Department for the strengthening of the bedding and upholstered furniture laws was defeated through the opposition of the reupholsterers and repairers. This defeat has meant not only the loss of much greater protection against misrepresentation for the consumer but also a loss of at least $40,000.00 or $50,000.00 in revenue to the Commonwealth. There is great need for uniformity among the various states as to their bedding and furniture laws. The proposed legislation would have been an important step toward uniformity.

Watered Clams — Shucked clams containing added water through prolonged soaking procedures were still found upon the market in 1947. A number of court prosecutions resulted, and in addition, there has been undertaken further research upon commercial washing processes with a view of setting up a standard which is now possible under the amended food law.

During March of 1948, the provisions of the recently amended food law with respect to seizure were invoked, resulting in the confiscation of 41 gallons of soaked

clams. The effect was almost instantaneous. The soaking stopped and clam dealers have since been able to supply the market with a product well above the advocated 18% total solids.

In addition to the aforementioned specific details handled during the 1942–1949 period, the following matters also demanded our effort and attention.

In 1944, an increase in the substitution of saccharin for sugar, particularly in soft drinks, was noted and also much decomposed meat was sold.

An increase in the sale of milk containing added water was also noted and was probably encouraged by the fact that the United States Government pays a subsidy to milk producers selling milk on a weight basis.

In 1945, among the significant violations encountered were carelessness exercised by restaurants in the handling of perishable meat and the continued use of saccharin as a sugar substitute in soft drinks. Also during this time, there were black market operations in violation of the slaughtering laws.

In 1946, a number of cream substitutes appeared on the market. These substitutes were mixtures of milk and cream with or without the addition of concentrated skimmed milk or skimmed milk powder. These products were sold to restaurants and also delivered to homes for serving in coffee and upon cereals in place of cream. The resulting combination contained varying amounts of milk fat below the required 16% standard for legal cream. It was necessary to institute prosecutions for the correction of this practice.

Laboratory examinations also revealed the adulteration of cider vinegar by the addition of distilled vinegar or commercial acetic acid. Warnings were issued to a number of vinegar manufacturers and packers.

In 1947, little or no substitution of saccharin for sugar by the manufacturers of soft drinks was found. A number of frozen dessert manufacturers, however, were found not to be exercising sufficient care in the matter of overrun leading to the incorporation of air in the finished product to an extent resulting in less than 1.6 pounds of food solids per gallon, the required standard.

The continued high price of eggs led to a more or less widespread violation and disregard of the cold storage egg law, which requires the labeling of eggs which have been in cold storage with the words, "cold storage eggs." Very few eggs have appeared on the market under the labeling "cold storage eggs" although the warehouses actually contain large quantities of eggs in storage. An enforcement program was started to require stricter adherence on the part of egg distributors to the provisions of the cold storage egg law.

Competition being very keen within the feather industry resulted in some pillow manufacturers attempting to label their filling materials as "all down," when in some instances the filling material contained actually a very small percentage of down. Chicken feathers were also found in filling materials labeled as "down." Our most reliable information concerning feathers and down or mixtures of feathers and down as a filling material is to the effect that the manufacturer is able to control the quantity of down in any mixture to a very fine degree, and we were in some cases forced to the conclusion that the incorrectly labeled filling materials result from deliberate action. The bedding laws of Massachusetts are in need of revision, with provision for a more adequate budget allowance for their enforcement. At the present time, one inspector must cover the entire industry, consisting of manufacturer, wholesaler, repairer and retail dealer.

In 1949 coliform organisms were found in many samples of pasteurized milk, indicating that more attention must be given to the question of contaimination of milk after pasteurization. Seventy-seven samples of pasteurized milk out of 310 examined were found to contain coliform organisms. The contamination has been found to extend to Grade A milk as well as to the grade of "milk pasteurized."

During the fiscal year between July 1, 1948 and July 1, 1949, 38 persons carried out the duties of the Food and Drug Division, under a total budget of $123,265, representing a cost of approximately three cents per year for each citizen of the Commonwealth. A part of this cost has been in effect returned as a dividend to the consumer, with the confiscation and removal from market channels of $75,000 worth of unfit foods. A new program was instituted wherein Miss Olive Sheridan, Bacteriologist of the Division, was placed in charge of the Laboratory Approval Program which was authorized by Chapter 344 of the Acts of 1939. She has approved

17 laboratories within the regulations established by the Act. An advisory committee for the Food and Drug Division was appointed so that a closer bond of cooperation could be established between industry, consumer and the Department in certain of the Department's law enforcing and additional activities.

As a final item, on July 1, 1946, Mr. Hermann C. Lythgoe, Director of the Division of Food and Drugs since its origin in 1915, was retired at the age of 72. His successor was Mr. Carl S. Ferguson who had served as Chief of Laboratory for many years.

The attached tables give summaries of the laboratory examinations; food confiscations; reports submitted by local slaughtering inspectors; extensions of time granted on foods in cold storage; prosecutions; and licenses and permits issued, together with the fees received therefrom.

Summary of Laboratory Examinations

	Milk and Milk Products Chemical	Milk and Milk Products Bact.	Foods	Drugs	Misc.*
Dec. 1941-Nov. 1942	5,654	7,741	2,260	155	2,056
Dec. 1942-Nov. 1943	6,256	5,949	1,654	153	123
Dec. 1943-Nov. 1944	5,971	5,267	1,569	247	
Dec. 1944-June 1945	3,488	4,588	1,440	225	101
July 1945-June 1946	6,611	5,244	2,146	372	219
July 1946-June 1947	4,777	6,143	1,725	150	200
July 1947-June 1948	3,872	4,420	2,498	115	202
July 1948-June 1949	2,024	5,059	3,127	95	604
Totals	38,653	44,411	16,419	1,512	3,505

* Includes liquors and narcotics for Police Departments, vitamin preparations, anti-freeze preparations, bedding and upholstered furniture materials.

Summary of Food Confiscations

Dec. 1941-Nov. 1942	84,577 lbs.
Dec. 1942-Nov. 1943	35,188 lbs.
Dec. 1943-Nov. 1944	80,406 lbs.
Dec. 1944-June 1945	65,660 lbs.
July 1945-June 1946	100,000 lbs.
July 1946-June 1947	74,294 lbs.
July 1946-June 1948	80,000 lbs.
July 1948-June 1949	160,149 lbs.
Total	680,274 lbs.

Summary of Slaughtering Reports Submitted by Local Slaughtering Inspectors

	Carcasses Inspected	Carcasses Condemned
Dec. 1941-Nov. 1942	149,630	2,166
Dec. 1942-Nov. 1943	167,925	1,698
Dec. 1943-Nov. 1944	183,046	1,718
Dec. 1944-June 1945	139,425	1,111
July 1945-June 1946	208,251	1,373
July 1946-June 1947	152,188	1,209
July 1947-June 1948	135,851	1,114
July 1948-June 1949	97,142	685
Totals	1,233,458	11,074

Summary of Extensions of Time Granted on Foods in Cold Storage Warehouses

Dec. 1941-Nov. 1942	150
Dec. 1942-Nov. 1943	84
Dec. 1943-Nov. 1944	129
Dec. 1944-June 1945	44
July 1945-June 1946	34
July 1946-June 1947	196
July 1947-June 1948	243
July 1948-June 1949	96
Total	976

Summary of Prosecutions

	Number	Convictions	Dismissals
Dec. 1941-Nov. 1942	349	314	35
Dec. 1942-Nov. 1943	219	201	18
Dec. 1943-Nov. 1944	238	215	23
Dec. 1944-June 1945	112	90	22
July 1945-June 1946	224	200	24
July 1946-June 1947	179	163	16
July 1947-June 1948	114	104	10
July 1948-June 1949	108	97	11
Totals	1,543	1,384	159

LICENSES AND PERMITS HAVE BEEN ISSUED AS FOLLOWS:

	Dec. 1941 through Nov. 1942	Dec. 1942 through Nov. 1943	Dec. 1943 through Nov. 1944	Dec. 1944 through June 1945	July 1945 through June 1946	July 1946 through June 1947	July 1947 through June 1948	July 1948 through June 1949
To Manufacturers and Wholesale Dealers in Narcotic Products								
Number Granted	40	39	38	9	38	35	26	42
Fees Received	$400 00	$390 00	$380 00	$90 00	$380 00	$350 00	$260 00	$420 00
To Manufacturers and Wholesale Distributors in Methyl Alcohol								
Number Granted	150	129	120	100	114	168	153	164
Fees Received	$1,500 00	$1,290 00	$1,200 00	$1,000 00	$1,140 00	$1,680 00	$1,530 00	$1,640 00
To Operators of Cold Storage or Refrigerating Warehouses								
Number Granted	556	55	65	37	78	94	107	110
Fees Received	$560 00	$550 00	$650 00	$370 00	$780 00	$940 00	$1,070 00	$1,100 00
For the Sterilization of Feathers, Down and Second Hand Material								
Number Granted	10	13	12	10	13	13	12	11
Fees Received	$500 00	$650 00	$600 00	$500 00	$650 00	$650 00	$600 00	$550 00
To Out-of-state Dealers for the Manufacture or Bottling of Carbonated Non-alcoholic Beverages								
Number Granted	39	28	37	22	37	33	43	41
Fees Received	$780 00	$560 00	$740 00	$440 00	$740 00	$660 00	$860 00	$820 00
To Out-of-state Dealers for the Sale of Frozen Desserts or Ice Cream Mix in Massachusetts (Fee Variable)								
Number Granted	24	22	32	36	36	43	43	42
Fees Received	$790 00	$874 00	$1,106 00	$1,191 00	$1,130 00	$1,305 00	$1,404 00	$1,304 00
One-half of Fees Received by Local Boards of Health for Carbonated Non-alcoholic Beverages, Mineral and Spring Water Permits								
Number Granted	236	210	245	152	219	216	244	246
Fees Received	$2,360 00	$2,100 00	$2,450 00	$1,520 00	$2,190 00	$2,160 00	$2,440 00	$2,460 00
Total Licenses and Permits Granted	555	496	549	366	535	602	628	656
Total Fees Received	$6,890 00	$6,414 00	$7,126 00	$5,111 00	$7,010 00	$6,945 00	$8,164 00	$8,294 00

DIVISON OF SANITARY ENGINEERING CONSOLIDATED REPORT 1942-1949

ARTHUR D. WESTON, C.E., *Director and Chief Sanitary Engineer*

Oversight and Care of Inland Waters

INTRODUCTORY

Prior to World War II it was customary to prepare for distribution an annual report of this Division covering matters relating to the oversight of inland waters and other environmental sanitation problems. Because of conditions created by World War II the 1940 annual report was the last printed report of the Division of Sanitary Engineering. A limited edition of a report covering the period January 1, 1941 to June 30, 1946 was mimeographed.

Because of the considerable demand for data covering the period of the war and the post-war period, it has seemed advisable to prepare the following combined report which covers the period January 1, 1941 to June 30, 1949.

APPLICATIONS FOR THE ADVICE OF THE DIVISION

The applications for the advice of the Department as submitted to the Division of Sanitary Engineering during the period January 1, 1941, to June 30, 1949, are as follows:

	January 1-December 31					Jan.-June	7/1/46-	7/1/47-	7/1/48-
	1941	1942	1943	1944	1945	1946	6/30/47	6/30/48	6/30/49
Public Water Supply	247	219	69	173	203	75	133	154	121
Wells*	234	94	59	85	101	52	187	158	149
Water Supply									
Schools	22	8	8	2	8	8	21	28	42
Camps	—	—	2	1	1	2	17	17	32
Ice	22	10	4	5	2	3	1	—	1
Bathing	54	47	35	60	66	30	77	132	130
Shellfish Areas	50	27	16	17	31	9	24	23	22
Stream Pollution	19	8	26	34	24	14	72	62	38
Boarding Homes	—	—	—	—	—	—	—	—	16
Sewage Disposal	283	122	65	67	86	52	125	96	150
Cross Connections	14	11	20	5	5	3	5	8	10
CCC Camps	2	—	—	—	—	—	—	—	—
Industrial Waste	—	—	—	—	—	—	—	—	14
Institution Water Supply & Sewage Disposal	8	5	2	19	4	2	15	22	31
Plumbing	—	—	—	—	—	—	2	1	—
Land Taking	10	10	2	8	4	—	3	6	4
R. & R.-Water Supply	1	—	—	1	—	—	1	2	—
Cemeteries	—	—	—	—	—	—	9	4	8
Police Stations	3	2	1	—	2	—	—	—	1
Miscellaneous	99	58	74	66	67	114	210	240	232
Common Carriers	—	—	—	—	—	—	2	9	4
Labs	—	—	—	—	—	—	9	3	—
Questionnaire	—	—	—	—	—	—	—	4	1
Total	1068	621	383	543	604	364	913	969	1056
Water Supply Pasteur Plants	—	—	—	—	—	—	—	—	8
Private Wells**	314	387	193	327	508	343	795	1044	1191
Camps***	710	504	274	325	350	310	514	830	642
Shellfish Inspections	449	422	84	342	432	78	397	367	267
Grand Total	2541	1934	934	1537	1894	1095	2619	3210	3164

* Exam. by Sanitary Engineer
** Exam. by Sanitary Inspectors or Others
*** Exam. under Chapter 140—General Laws, as amended

ROUTINE WORK

The routine activities of the Division of Sanitary Engineering, in spite of the decrease in personnel, increased considerably during the period of the war. These activities have been as follows:

Assistance to the armed forces in matters of water supply, sewerage and sewage disposal and other environmental sanitation problems.

General advice to cities, towns and persons in matters of water supply, drainage, sewerage and sewage disposal.

Investigations leading to the adoption of rules and regulations for protecting sources of water supply and enforcement of such rules and regulations.

Investigations leading to removal of sources of pollution of water supplies.

Investigations relative to the efficiency of the operation of sewage treatment works.

Investigations relative to pollution of streams, examinations of sewer outlets, enforcement of legislation relating to pollution of certain streams and certain coastal waters.

Investigations relative to the use of emergency sources of water supply.

Approval of the acquisition of lands for protecting sources of water supply and lands for sewage treatment works.

Investigations as to effect of industrial wastes on sewers and sewage treatment works.

Investigations leading to approval of plans for police stations, lockups and houses of detention.

Investigations relative to offensive trades.

Investigations relative to the approval of the use of lands for cemetery purposes and for the construction of mausoleums and crematories.

Investigations leading to advice to cities, towns and persons in matters of bathing places, garbage and refuse disposal, nuisances, private water supplies and similar problems.

Investigations relative to sources of water supply where the water is bottled and sold or used in the manufacture of nonalcoholic beverages.

Investigations relative to pollution of water supplies by cross connections.

Investigations as to the location of public institutions.

Preparation of plans for water supply and sewerage for institutions of the Department and certain other state institutions.

Approval of municipal plumbing rules and regulations.

Investigations relative to the pollution of coastal waters from which shellfish are taken.

Investigations relative to sanitary conditions of shellfish-handling establishments and consideration of certificates of out-of-state shellfish shippers.

Investigations relative to the approval of shellfish purification plants and the operation thereof.

Representatives of the Division have attended various meetings of the State Planning Board and the Department has been represented on the State Reclamation Board by an engineer of the Division.

Representatives of the Division have participated in the Sanitation Courses at the University of Massachusetts. The work has included lectures, field trips and assistance to the faculty in preparation of courses.

Representatives of the Division have from time to time given lectures on general sanitation matters at various hospitals throughout the State to classes of nurses in training.

Papers on the problem and solution of stream pollution have been presented to many civic and professional organizations throughout the State by engineers of this Division.

General advice to the Legislature in matters of water supply, drainage, sewerage and sewage disposal, shellfish and other environmental sanitation problems.

Special Legislative Investigations

This Division has assisted in the following special investigations directed by the resolves of the Legislature during the period from January 1, 1941, to June 30, 1949:

Resolve	Subject	Report
Chapter 71 of 1941	Investigation and study relative to requiring owners of tenements and other dwellings leased or rented for human habitation to bring them up to certain standards to promote the health and well being of persons	House 1632 of 1943

Resolve	Subject	Report
	residing therein and relative to limited dividend corporations under the control of the State Housing Board.	
Chapter 91 of 1941	Investigation relative to the use by additional municipalities of the Quabbin Reservoir for water supply purposes, and relative to the relation of the city of Boston to and its share of the expenses of the Metropolitan District Commission.	House 1334 of 1943
Chapter 93 of 1941	Investigation relative to additional sewerage works for the South Metropolitan Sewerage District in the Dorchester District of the city of Boston and the town of Milton.	House 1278 of 1943
Chapter 40 of 1943	Study and survey of the Neponset River.	House 1925 of 1945
Chapter 50 of 1943	Investigation and study of the laws of the Commonwealth relative to housing and of drafting a housing law.	House 4 of 1945
Chapter 35 of 1945	Investigation and study relative to the protection of the public health and the relief from the mosquito nuisance in the Charles River Valley and the Jennings Pond area.	House 1439 of 1946
Chapter 38 of 1945 and Chapter 51 of 1946	Investigation and study relative to the decay of teeth resulting from a lack of fluorine.	House 1608 of 1946 and House 1786 of 1947
Chapter 51 of 1945	An investigation relative to excluding certain areas in the city of Boston from the South Metropolitan sewerage system.	House 190 of 1946
Chapter 59 of 1945	Investigation relative to the condition of flow of water in the Neponset River, and related matters.	House 1440 of 1946
Chapter 62 of 1945 and Chapter 47 of 1946	Investigation and study of, and the preparation of plans and maps for, the disposal of sewage in the Merrimack River Valley.	Senate 550 of 1947
Chapter 83 of 1945	Investigation and study relative to the water supply needs of municipalities in the Connecticut, Chicopee, Swift, Ware, Quaboag and Millers river valleys.	House 1667 of 1947
Chapter 58 of 1946 and Chapter 22 of 1947	Investigation and study relative to the protection of the public health and the relief from the greenhead fly nuisance in the tidal areas in northern Essex County.	Senate 60 of 1947 and Senate 429 of 1948
Chapter 60 of 1946	Study relative to providing for the construction of a bulkhead at Clark's Cove in the city of New Bedford, for the purpose of abating a nuisance.	Senate 70 of 1947
Chapter 93 of 1946	Investigation and study relative to the cause and eradication thereof of poliomyelitis in the Commonwealth.	Senate 50 of 1947
Chapter 43 of 1947 and Chapter 60 of 1948	Investigation and study relative to edible shellfish and shellfish purification plants.	House 1770 of 1948 and House 2275 of 1949
Chapter 63 of 1947 and Chapter 40 of 1948	Continuing the investigation of the disposal of sewage in the Merrimack River Valley.	House 148 of 1948 and House 2045 of 1949
Chapter 26 of 1948	Investigation and study of the causes creating a nuisance on the shore and beaches of Swampscott, and of means of rectifying such conditions.	House 2095 of 1949

Resolve	Subject	Report
Chapter 41 of 1948 and Chapter 57 of 1949	Investigation relative to the disposal of sewage in the South Metropolitan Sewerage District and to the extension of said district.	House 2151 of 1949 and House 2263 of 1950
Chapter 26 of 1949	Investigation and study of the causes creating a nuisance on the shore and beaches of Marblehead, Salem, Danvers, Beverly and Manchester, and of means of rectifying such conditions.	House 2236 of 1950
Chapter 31 of 1949	Investigation and study of the disposal of sewage and industrial wastes in the Housatonic River Valley.	Senate 555 of 1950
Chapter 34 of 1949	Study relative to the Sudbury River and its environs.	House 2351 of 1950

Special Activities During the War Years

National Defence and War Agencies

Early in the year 1940, it became apparent that a greater degree of public protection was necessary because of the possibility of sabotage which might affect the production of war materials and the health of persons employed in industry, as well as the resident population. The water departments were advised as to necessary additional precautions and the Department advised in accordance with the instructions of the Surgeon General of the Public Health Service that all surface water supplies be properly chlorinated, unless otherwise properly treated. The authority delegated to water works officials to permit boating and fishing on public water supplies was revoked by the Department. Storage depots for water works chemicals were established at key points. The Division was represented on the staff of the State Adjutant General and the Division advised the First Service Command of the U. S. Army and the U. S. Navy as to critical public water supplies requiring guarding and assisted the Massachusetts Committee on Public Safety in the training of chemists and bacteriologists in the decontamination of areas affected by war gases. In addition, the Division carried out environmental sanitation surveys in the vicinity of military establishments.

Fully 50% of the work of the Division of Sanitary Engineering during the years 1941 through 1944 was taken up with such activities furthering the war effort. By the end of 1944, however, conditions warranted little activity in connection with security matters. The duties of the Massachusetts Committee on Public Safety were transferred to the Governor's Disaster Relief Commission.

Hurricane of 1944

In addition to the work of the Division of Sanitary Engineering in National Defense, the Division was called upon to assist the Massachusetts Committee on Public Safety during the hurricane of September 14, and 15, 1944. The hurricane interrupted public water supplies in only two instances. While the damage to power lines prevented the operation of motor-driven pumps, auxiliary power was available in all cases for public water supplies in the areas most seriously affected, i.e., on Cape Cod. Service was temporarily interrupted in the town of Fairhaven because of a broken water main and in the town of Tisbury on Martha's Vineyard because of the overflowing of the supply with salt water during the extreme high tides which resulted from the hurricane. Water was supplied to certain areas by tank trucks and local boards of health were assisted in examination of private wells inundated with sea water.

Water Shortages

In the period covered by this report, the years 1941 to 1949 were especially dry, the drought in the year 1949 being the most severe of recent years. The experiences during the drought of 1941 had been a warning to public water supply officials. During and after the war many wells were installed for additional water supply. The drought of 1949 began much earlier in the season than usual, the month of June,

1949, being especially dry and encouraging the greater use of water during the growing season in private and market gardening. The following is a list of the municipalities experiencing water shortages covered by this report through the month of June, 1949:

Amesbury	1941	Marblehead	1941–1943
Ashland	1941	Maynard	1941–1943
Ayer	1941	Millbury	1941–1943
Brookfield	1941	Newburyport	1941–1943
Brookline	1941	Newton	1941–1943
Clinton	1941	Northbridge	1941–1943
Dedham	1941	Orange	1941
Dracut	1941	Scituate	1941
Easton	1941	Spencer	1941
(No. Easton Vill. Dist.)		Shelburne (Shelburne Falls	
Fitchburg	1941	Fire Dist.)	1941
Greenfield	1941	So. Hadley (So. Hadley Fire	
Ipswich	1941	Dist. No. 2)	1941
Leicester	1941	Wakefield	1941
(Leicester Water Supply Board)		Waltham	1946
Leominster	1941	Winchendon	1947–1948–1949
Lincoln	1941	Winchester	1941
Lowell	1941–1943	West Springfield	1941

Examination of Public Water Supplies

On June 30, 1949, 264 of the 351 cities and towns in the Commonwealth with an aggregate population of 4,404,480 persons are considered as having public water supplies. The population of these cities and towns is about 98 per cent of 4,493,235 persons — the total population of the State. There still remain 87 municipalities in the State not considered as having public water supply systems. A total population of those municipalities not supplied by public water supplies is 88,755 of which 6,000 persons are supplied from semi-public supplies or in public institutions.

The following table summarizes the major additions and improvements in connection with the public water supplies in the State during the years 1941 through June 30, 1949.

Establishment of Public Water Supplies

West Boylston	
(West Boylston Water District)	1941
Dennis	
(Dennis Water District)	1946
Wenham	1946
Bourne	
(South Sagamore Water District)	1947
(North Sagamore Water District)	1947
Mendon (in part)	1947
Seekonk Water District	1948
Sandwich Water District	1948
Rowley	1948
Newbury (Byfield Water District)	1949
Topsfield	1949
Essex	1949

Additions and Improvements in Source of Supply

Abington and Rockland	Improvements to inlet of Great Sandy Bottom Pond	(1943)
Acton		
West and South Water Supply District	Reconstruction of collecting system	(1941)
Adams	Two gravel-packed wells	(1949)
Amesbury	23 additional tubular wells	(1942)

ADDITIONS AND IMPROVEMENTS IN SOURCE OF SUPPLY (Continued)

Ashland	Two gravel-packed wells installed	(1941–1942)
	and concrete standpipe installed	(1941)
Attleboro	Two gravel-packed wells	(1947)
Auburn	Additional tubular wells	(1944)
	Gravel-packed well	(1947)
*Ayer	Additional tubular wells installed	(1941)
	Gravel-packed well	(1943)
*Ayer		
Fort Devens	Gravel-packed well and 40 tubular wells installed	(1941)
Avon	Gravel-packed well	(1941–1942)
Barnstable	Additional gravel-packed well	(1942)
Cotuit Fire District	Additional gravel-packed well	(1949)
Barnstable Water Company	Two gravel-packed wells	(1947)
Centerville-Osterville Fire District	Test wells	(1947)
*Bedford	Connecting mains to Lexington and concrete reservoir	(1942)
	New gravel-packed well	(1943)
Billerica	Reconditioning of gravel-packed wells	(1943)
	Additional gravel-packed well	(1949)
Bourne		
No. Sagamore Water District	Test wells	(1947)
Boylston		
(Morningdale Water District)	Test wells	(1949)
Braintree	Increased storage by new dam in Great Pond	(1943)
Brewster	Test wells	(1947)
Bridgewater	Gravel-packed wells	(1948–1949)
Cambridge	Test wells installed	(1941)
*Chicopee	36″ connecting main to Springfield-Ludlow system	(1942–1945)
Concord	Test wells	(1947)
	Gravel-packed well	(1949)
Dedham		
Dedham Water Company	Two gravel-packed wells	(1943–1944)
Dennis		
Dennis Water District	Three gravel-packed wells	(1945–1946)
Douglas	Two 6-inch wells	(1943–1944)
Dracut	New gravel-packed well	(1941–1942)
	New gravel-packed well	(1949)
Dudley	Additional tubular wells	(1943)
Duxbury		
Duxbury Fire and Water District	Test wells and pumping test	(1947)
*East Longmeadow	10″ connecting main to Springfield system	(1942)
Grafton		
Grafton Water Company	Gravel-packed well	(1944)
Easton		
North Easton Village District	Tubular test wells	(1941)
Edgartown		
Edgartown Water Company	Gravel-packed well	(1947)
Essex	Gravel-packed well being installed	(1948)

*Because of War Activities

ADDITIONS AND IMPROVEMENTS IN SOURCE OF SUPPLY—(Continued)

*Fall River	Industrial supply from Noquochoke River	(1942–1943)
*Falmouth	Two tubular well fields	(1942)
Foxborough	Three gravel-packed wells	(1949)
Franklin	Gravel-packed well	(1944)
	Not yet developed for use	(1945)
Georgetown	Connection to Byfield Water District	(1949)
Gloucester	New covered reservoir	(1941–1942)
Grafton		
Grafton Water Company	Gravel-packed well	(1947)
Granville Centre Water Co.	Deep tubular well	(1949)
Greenfield	Gravel-packed well	(1947)
Great Barrington		
Great Barrington Fire District	Enlargement of East Mountain Reservoirs	(1947)
Groton-Groton Water Co.	Test wells	(1947)
*Hanover	Gravel-packed well	(1943)
Hamilton	Connection for supply from Essex	(1949)
Haverhill	New pumps at Kenoza Lake	(1948)
	Pumping station at Crystal Lake	(1949)
Hingham		
Hingham Water Co.	Gravel-packed well	(1942–1943)
Hopkinton	Well supply at Maspenock Lake	(1943–1944)
*Hudson	Tubular well supply	(1944)
	Crystal Spring	(1947)
Ipswich	One gravel-packed well	(1942)
	One gravel-packed well	(1942–1943)
Kingston	Gravel-packed well	(1947)
Lanesborough		
Berkshire Cooperative Water Works	Distribution main and pump	(1941–1942)
Leicester Water Supply District	Deep tubular well	(1949)
Littleton	Additional tubular wells	(1944)
Lowell	Two gravel-packed wells	(1942)
	Two gravel-packed wells	(1949)
Marion	Tubular test wells	(1941)
	Gravel-packed well	(1942–1943)
	Two gravel-packed wells	(1948)
Marshfield	Test wells	(1947)
Maynard	New supply main and pumping station	(1941–1942)
Medway	Gravel-packed well	(1942–1943)
Merrimac	Additional tubular wells	(1949)
Methuen	Local supplies abandoned	(1942)
	All water purchased from Lawrence since October 1, 1942	
Middleboro	Gravel-packed wells at Rock Village	(1948)
Milford	New tubular wells	(1942)
Montague Bartlett Supply	New dug well	(1941–1942)
	Old supply abandoned	
Natick	Gravel-packed well	(1947)
Northbridge Whitin Machine Works	Additional tubular wells	(1941–1942–1949)
Norfolk	Pipe line completed	(1946)
Northborough	Test wells	(1947)
Norton	Large tubular well	(1941)
	Gravel-packed wells	(1947)

*Because of War Activities

ADDITIONS AND IMPROVEMENTS IN SOURCE OF SUPPLY—(Continued)

North Andover	New pumps	(1949)
Norwood	Gravel-packed well	(1943)
*Orange	Gravel-packed well	(1943)
Palmer		
Three Rivers Fire District	New water supply	(1943–1946)
Peabody	Tubular test wells	(1941)
	Not finally developed	(1945)
Pittsfield	New Reservoir on Sackett Brook	(1947)
	New Cleveland Brook Reservoir in Hinsdale started	(1948)
Plymouth	Tubular wells	(1941)
	Gravel-packed well	(1948)
Rowley	Test wells and pumping test	(1946)
Saugus	Joined Metropolitan Water District	(1946)
Salisbury Water Supply	Two gravel-packed wells	(1949)
Scituate	Gravel-packed well	(1943–1944)
	Gravel-packed well	(1948)
Seekonk Water District	Tubular wells	(1947)
Sharon	Gravel-packed well	(1943–1945)
Shelburne and Buckland		
Shelburne Falls Fire District	Tubular wells	(1941)
Shrewsbury	New gravel-packed well South St.	(1941–1942)
	Test wells for additional supply	(1949)
South Hadley		
South Hadley Fire District No. 1	Increased storage capacity of Buttery Brook Reservoir	(1941)
	New pump and pump house	(1944)
South Hadley Fire District No. 2	Storage reservoir on North Branch of Elmer Brook	(1941–1949)
Somerset	Gravel-packed wells	(1947–1948–1949
*Springfield	Auxiliary supply main from Cobble Mountain supply	(1942–1943)
Stoughton	Gravel-packed well	(1941)
Sutton		
Sutton Water Company	Development of a spring	(1947)
Swansea Water District	Test wells	(1948)
Templeton	Test wells	(1947)
Upton		
Upton Center Water District	Test wells	(1947)
Uxbridge	Gravel-packed well	(1944)
*Walpole	50 additional tubular wells	(1943–1944)
Wareham		
Wareham Fire District	Two gravel-packed wells	(1947)
Wayland	Gravel-packed well	(1944)
Wenham	Test wells and pumping test	(1946)
Weston	Gravel-packed well	(1941)
West Boylston		
West Boylston Water District	Gravel-packed well and distribution system	(1941)
	Additional gravel-packed well	(1942)
West Brookfield	Additional tubular wells	(1944)
West Stockbridge		
West Stockbridge Water Company	Development of additional springs	(1941)

*Because of War Activities

ADDITIONS AND IMPROVEMENTS IN SOURCE OF SUPPLY—(Continued)

Weymouth	Ground water supply	( )
	Tubular test wells	(1942)
	Gravel-packed well	(1944)
Worthington Fire District	Deep tubular well	(1949)
Wrentham	Additional water supply Test wells	(1942)
	Gravel-packed well	(1943–1944)
Yarmouth	Four gravel-packed wells and reconstruction of pumping station	(1947)

Treatment Works

Ashland	Iron and manganese removal plant	(1943–1944)
Chicopee	Equipped for use of activated carbon and chlorine dioxide for taste and odor control	(1943–1945)
Lanesborough		
Lanesborough Village Fire and Water District	Zeolite water softening plant	(1941)
Leicester		
Cherry Valley and Rochdale Water District	Slow sand filter	(1948)
*Leominster	Four additional rapid sand filters	(1942)
Sunderland		
Sunderland Water Co.	Slow sand filter plant	(1948)
Winchester	Zeolite water softening plant	(1941)

Chemical Treatment for Correction of Corrosiveness

Andover	Haggett's Pond—Soda Ash	(1946)
Auburn		
Auburn Water Company	Tubular wells—Soda Ash	(1942)
Barnstable		
Barnstable Water Co.	Tubular wells Cedar Swamp Pumping Station—Soda Ash	(1941)
Barnstable		
Cotuit Fire District	Gravel-packed wells—Lime or Soda Ash (under investigation)	
Brookfield	Tubular wells—Soda Ash	(1943)
Chelmsford		
North Chelmsford Water District	Tubular wells—Hexametaphosphate	(1942)
Chatham	Tubular and gravel-packed wells—Soda Ash	(1945)
Edgartown		
Edgartown Water Company	Tubular and gravel packed wells—Soda Ash	(1947)
Foxborough	Tubular wells and gravel-packed well—Soda Ash	(1941)
Gosnold (Cuttyhunk)	Dug well—Soda Ash	(1948)
Hanover	Gravel-packed well—Soda Ash	(1943)
Haverhill	Kenoza Lake (Lime and hexametaphosphate)	(1949)
Hingham		
Hingham Water Company	Gravel-packed well—Lime	(1943)
Hudson	Tubular wells—Soda Ash	(1944)
Lowell	Cook wells—Soda Ash	(1945)
Millbury		
Massachusetts Water Works Company	Dug well	(1941)
North Andover	Lake Cochichewick—Soda Ash	(1943)
Salem and Beverly	Wenham Lake (Hexametaphosphate)	(1948)

Chemical Treatment for Correction of Corrosiveness — (Continued)

Scituate	Tubular wells—Soda Ash	(1941)
Stoughton	Collecting gallery—Soda Ash	(1941)
Townsend	Tubular wells—Soda Ash or Lime under investigation	(1947)
Upton		
Wm. Knowlton & Sons Co.	Tubular wells—Septaphosphate	(1945)
Uxbridge	Tubular wells—Hexametaphosphate	(1942)
Westfield		
Westfield State Sanatorium	Tubular wells—Soda Ash	(1941)
Winchester	Reservoir supply. Later removed.	(1941)

Chlorinators Installed

Amesbury	Tubular wells	(1942)
Athol	At filter plant	(1942)
Attleboro	Orr's Pond, dug and gravel-packed wells	(1941–1942)
Barre	Allen Hill Reservoir	(1943)
Bedford	Tubular wells	(1942–1943)
Beverly	Prechlorination	(1942)
Brockton	Silver Lake	(1942)
Cheshire Water Co.	Kitchen Brook Reservoir	(1949)
Chicopee	Cooley Brook Reservoir prechlorination	(1941)
Clinton	Wachusett supply	(1942)
Colrain Fire District No. 1	Mountain Brook Reservoir	(1948)
Deerfield		
South Deerfield Water District	Reservoir	(1942)
Falmouth	Long Pond	(1941)
Fitchburg	Reservoir	(1942–1944)
Grafton		
Grafton Water Co.	Dug well	(1944)
Grafton		
Fisherville Mfg. Co.	Tubular wells	(1941)
Hatfield	Running Gutter Brook	(1944)
Hingham		
Hingham Water Co.	Gravel-packed well	(1943)
Holyoke	Whitin Street Reservoir	(1941)
Hudson	Gates Pond	(1944–1945)
Lawrence	Distribution Reservoir Outlet	(1949)
Leicester		
Cherry Valley and Rochdale Water Dist.	Dug well and Henshaw Pond	(1941)
Lee	Reservoirs	(1947)
Lenox	New chlorinator building	(1943)
Marblehead	Thompson Meadow wells	(1943)
Medfield		
State Hospital	Old tubular wells	(1943)
Monson	Ingalls Brook	(1941–1942)
Monson		
Monson State Hospital	Tubular well supply	(1941)
Monroe		
Monroe Water District	Filter plant	(1942)
Montague	Lake Pleasant	(1942)
New Bedford	Little Quitticas Pond	(1942)
North Adams	Notch Brook Reservoir	(1941–1942)
	Mt. William supply	(1941–1942)
North Andover	Lake Cochichewick-Duplicate chlorinators	(1941)
Oak Bluffs	Well supply	(1943)

Chlorinators Installed— (Continued)

Peabody	Pumping Station Duplicate chlorinators	(1942)
Shelburne Falls Fire District	Fox Brook Reservoir	(1949)
Somerset	Tubular wells	(1947)
Springfield	Ludlow supply	(1942)
Stockbridge		
Stockbridge Water Co.	Lake Averic	(1947)
Taunton	Pond supply	(1943)
Ware	Ground water supply	(1942)
Westfield	Granville Reservoir	(1941)
Weymouth	Great Pond	(1942)
Williamsburg	Reservoir	(1941)
Williamstown	Reservoir and spring	(1947)
Worcester	Reservoirs	(1942–1943)

Ammoniators Installed in Connection with Chlorinators

Amherst	Reservoirs	(1942)
Athol	At filter plant	(1942)
Chicopee	Cooley Brook Reservoir—Pre-ammoniation	(1941)
Falmouth	Long Pond	(1941)
Fitchburg	Reservoirs	(1943–1944)
New Bedford	At pumping station	(1942)
Palmer		
Palmer Fire Dist. No. 1	Reservoirs	(1941)
Springfield	Ludlow supply	(1942)
Ware	Ground water supply	(1942)
Westfield	Granville supply	(1941)

Quality of Public Water Supplies

The Division of Sanitary Engineering provides for the chemical analysis and the microscopic and bacterial examination of samples of water from the public and semi-public water supplies in the Commonwealth. Containers are sent to the officials in charge of these works and are returned to the appropriate laboratories of this Division. Chemical analyses are made of the natural and treated waters three to six times per year. Microscopic examinations are regularly made of all surface water supplies, and bacterial examinations are made of the water of samples collected from distribution systems at intervals of four weeks. The results of the chemical analyses are sent regularly to the officials in charge of public water supplies, and upon request the results of the microscopic and bacterial examinations are also sent. Where the microscopical or bacterial results indicate approaching trouble, special investigations are made by the sanitary engineers of the Division. The results of the chemical analyses of samples collected during the calendar year 1949 are shown in the following tables:

Analyses of the Water of Public Water Supplies — Averages of Chemical Analyses of Ground Water Sources for the Year 1949

City or Town	Source	Color	Ammonia: Free	Ammonia: Total Albuminoid	Nitrogen as Nitrates	Nitrites	Chlorides	Hardness	Alkalinity	Mn	Fe	pH	No. of Samples
		Parts per Million											
Acton (West and South Water Supply District)	Tubular wells	2	–	–	1.3	.000	4.9	37	23	–	.05	6.1	3
Adams Fire District	Wells	2	–	–	.39	.000	2.2	113	111	–	.05	7.6	3
Amesbury	Tubular wells at Powow River (raw water)	53	–	–	.11	.004	5.7	61	53	.31	6.9	6.7	3
	Tubular wells at Powow River (filtered water)	21	–	–	.07	.000	5.8	59	62	.00	.59	7.4	3
Ashland	New Tubular Wells	11	–	–	.13	.000	7.0	25	16	.38	1.6	5.9	3
	Gravel-Packed Wells before treatment	5	–	–	.13	.000	5.7	69	77	.36	.07	7.0	3
	Gravel-Packed Wells after treatment	3	–	–	.09	.003	5.6	65	76	.00	.06	7.0	3
Attleboro	Dug Wells before treatment, So. Attleboro	3	–	–	.25	.000	4.5	22	13	.01	.03	6.0	3
Attleboro	Gravel-Packed Wells, So. Attleborough	2	–	–	.11	.000	3.7	22	17	–	.15	6.0	2
	Dug Wells and Gravel-Packed Wells, Treated Water, So. Attleborough	9	–	–	.27	.000	4.5	35	29	–	.04	7.4	3
Auburn (Water Co.)	Tubular Wells	3	–	–	1.8	.000	9.1	48	34	–	.14	6.4	3
Avon	Gravel-Packed Well	2	–	–	2.0	.000	10.5	41	20	–	.03	5.9	3
Ayer	Gravel-Packed Wells	3	–	–	.47	.000	16.6	54	50	–	.11	6.6	3
Barnstable (Water Co.)	Tubular Wells(Mary Dunn Sta.)	2	–	–	.06	.000	14.7	14	6	–	.08	5.4	3
	Gravel-packed well	4	–	–	.07	.000	13.7	10	6	–	1.4	5.4	3
	Tubular Wells, Mahor Station No. 2	2	–	–	.25	.000	12.7	19	11	–	.10	5.6	3
	Gravel-packed well, Mahor Station No. 3	2	–	–	.12	.001	10.7	14	11	–	.04	5.8	3
Barnstable (Fire District)	Yarmouth Supply	2	–	–	.08	.000	14.7	19	16	–	.03	6.3	3
Barnstable (Centerville, Osterville Fire District)	Tubular Wells	2	–	–	.07	.000	11.7	11	7	–	.07	5.6	3
	Gravel-Packed Wells	3	–	–	.40	.000	11.1	11	6	–	.11	5.5	3
Barnstable (Cotuit Fire and Water District)	Wells	3	–	–	.08	.000	10.5	8	8	–	.09	5.5	3
Barre	Gravel-Packed Well	3	–	–	.09	.000	1.9	14	10	–	.49	5.8	3
Bedford	Old Dug Well and Gravel-Packed Well	2	–	–	.65	.000	5.6	28	14	–	.12	6.1	3
Belchertown (Water District)	Tubular Wells	2	–	–	.83	.000	8.1	36	21	–	.09	6.2	3
Bellingham	Gravel-Packed Well No. 1	2	–	–	.29	.000	3.2	26	19	–	.04	6.2	3
	Gravel-Packed Well No. 2	2	–	–	.17	.000	3.2	20	17	–	.04	6.2	3
Bernardston	Dug Well	3	–	–	.26	.000	1.8	23	21	–	.05	8.3	3
Billerica	Gravel-Packed Wells	38	–	–	.17	.000	16.3	28	19	.39	1.4	6.4	3
Bourne (Water District)	Gravel-Packed Wells	2	–	–	.07	.000	7.9	12	9	–	.06	5.9	3
Bourne (Buzzards Bay Water District)	Tubular Wells	2	–	–	.06	.000	8.2	11	8	–	.29	5.8	3
Bourne, South Sagamore Water District	Tubular Wells	2	–	–	.10	.000	8.4	8	10	–	.04	6.2	6

Bourne (Sagamore-Ware Tenement Supply)	Tubular Wells	2	–	–	1.9	.000	12.0	16	7	–	.20	5.7	1
(Sagamore-Savory Supply)	Tubular Wells	3	–	–	.29	.000	9.4	13	11	–	.24	6.1	4
Bridgewater	Tubular Wells	2	–	–	1.8	.000	7.1	25	10	–	.09	5.9	2
Brookfield	Dug and Tubular Wells	17	–	–	.12	.000	6.1	24	95	–	2.3	7.2	3
Brookline	Tubular Wells, Gravel-Packed Wells and Filter Gallery, Raw Water	50	–	–	.42	.003	9.9	45	45	.39	2.3	6.4	3
	Tubular Wells, Gravel-Packed Wells and Filter Gallery, Filtered Water	15	–	–	.29	.000	9.6	47	44	.00	.37	7.6	3
Canton	Henry's Spring Well	2	–	–	1.9	.000	7.7	27	13	.00	.06	5.9	3
	Ward Well	9	–	–	1.0	.000	7.9	23	14	–	.05	6.2	3
	Springdale Well	1	–	–	1.2	.000	6.6	25	12	–	.08	6.0	3
Chatham (Water Co.)	Tubular Wells	3	–	–	.05	.000	14.0	8	6	.01	.80	5.7	1
	Gravel-Packed Well	2	–	–	.24	.000	12.4	23	9	–	.05	5.9	4
Chelmsford (No. Chelmsford Fire District)	Tubular Wells	36	–	–	.31	.002	9.8	27	24	–	1.6	6.3	3
Chelmsford (Water District)	Tubular Wells	7	–	–	1.5	.000	6.0	36	20	–	49.	6.0	3
Cohasset (Water Co.)	Raw Water at Filter Plant	107	–	–	.06	.000	12.5	22	14	.19	2.3	5.8	3
	Filtered Water	8	–	–	.07	.000	13.9	52	22	.13	.04	7.2	3
Colrain (Griswoldville)	Deep Tubular Well	3	–	–	.42	.000	5.9	63	58	.00	.04	7.1	2
(Lyonsville)	Spring	3	–	–	.10	.000	0.9	34	28	.00	.07	6.7	1
(Lyonsville)	Deep Tubular Well	2	–	–	.06	.000	1.8	69	82	.00	.08	7.8	2
Cummington	Springs	4	–	–	1.3	.000	3.3	31	26	–	.19	6.7	1
Dedham (Water Co.)	Dug and Tubular Wells	8	–	–	.60	.000	10.4	36	27	–	.35	6.3	4
	Tubular Wells, Rock Meadow	2	–	–	1.0	.000	8.4	25	10	–	.04	5.7	1
Deerfield (Fire District)	North Springs	2	–	–	.07	.000	10.6	33	20	.00	.08	6.3	3
	Harris Springs	3	–	–	.62	.000	2.4	28	18	.00	.05	6.6	3
	South Springs	3	–	–	.45	.000	2.2	22	13	.02	.20	6.4	3
Dennis (Water District)	Gravel-Packed Wells	3	–	–	.08	.000	13.0	9	7	–	.29	5.8	3
Douglas	Tubular Wells	2	–	–	.93	.000	4.4	22	15	.00	.03	6.0	3
Dover	Tubular Wells	3	–	–	1.5	.002	15.8	46	31	.01	.42	6.5	2
Dracut	Tubular Wells	6	–	–	3.8	.000	9.5	66	38	.01	.20	6.5	3
(Water Supply District)	Gravel-Packed Well	1	–	–	.93	.000	3.7	34	18	.00	.03	6.4	3
Dudley	Tubular Wells	2	–	–	.27	.000	3.7	17	12	–	.06	5.9	3
Dunstable	Tubular Wells	1	–	–	1.4	.000	4.6	31	26	.00	.16	6.1	3
Duxbury (Fire and Water District)	Tubular Wells	2	–	–	.06	.000	11.3	16	11	.00	.04	6.0	3
	Gravel-Packed Well	2	–	–	.32	.000	14.3	17	9	–	.03	5.8	2
East Brookfield	Dug Well	4	–	–	.10	.000	2.6	13	9	.02	.12	5.9	3
Easthampton	Tubular Well	2	–	–	.65	.000	2.2	48	47	.00	.03	8.2	3
Easton (No. Easton Village District)	Dug Well	3	–	–	.19	.000	4.6	26	21	.00	.05	6.2	4
Edgartown	Dug and Tubular Wells	1	–	–	.05	.000	11.4	8	50	.00	.04	9.1	3
	Gravel-Packed Well	1	–	–	1.5	.000	21.3	21	77	.00	.04	8.4	3
Fairhaven (Water Co.)	Tubular Wells near Nasketucket River	25	–	–	1.6	.000	13.3	39	17	.00	.49	5.8	3
(Water Co.)	Tubular Wells near Mattapoisett River	3	–	–	.83	.000	10.1	23	14	.01	.08	5.9	3
Foxborough	Tubular Wells	6	–	–	.44	.000	4.7	25	21	.14	.42	6.3	4
Framingham	Gravel-Packed Well No. 1	4	–	–	.09	.000	7.2	68	53	.44	.11	6.9	3
	Gravel-Packed Well No. 2	12	–	–	.07	.000	7.6	62	50	.12	.60	6.8	2
	Gravel-Packed Well No. 3	3	–	–	.36	.000	6.6	54	40	.07	.07	6.7	3
Franklin	Dug Well	6	–	–	.78	.000	3.9	18	17	.08	.84	6.1	3

Analyses of the Water of Public Water Supplies — Averages of Chemical Analyses of Ground Water Sources for the Year 1949

City or Town	Source	Color	Ammonia: Free	Ammonia: Total Albuminoid	Nitrogen as Nitrates	Nitrites	Chlorides	Hardness	Alkalinity	Mn	Fe	pH	No. of Samples
		Parts per Million											
Franklin	Gravel-Packed Well No. 1	2	–	–	.32	.000	3.5	22	21	1.8	1.2	5.8	3
	Gravel-Packed Well No. 2	2	–	–	.07	.000	3.0	18	17	1.0	.49	6.1	3
	Dug Well and Gravel-Packed Wells	2	–	–	.27	.000	4.3	21	18	.08	.66	6.1	3
Georgetown	Tubular Wells—Raw Water	3	–	–	.14	.000	4.5	30	43	.04	.35	6.4	4
	Tubular Wells—Filtered Water	2	–	–	.16	.000	4.6	28	20	.00	.31	6.4	4
Gill (Riverside Water Co.)	Spring	3	–	–	1.1	.000	3.0	37	26	–	.17	6.5	2
Gosnold	Well	2	–	–	1.8	.000	99.6	50	46	.00	.07	7.0	12
Grafton (Water Co.)	Gravel-Packed Well at No. Grafton	2	–	–	1.6	.000	9.7	40	29	–	.01	6.0	2
(Water Co.)	Dug Wells at Grafton	5	–	–	2.1	.001	13.4	41	25	–	.19	6.1	3
(Saundersville Supply)	Springs	4	–	–	2.6	.007	10.3	46	28	–	.22	6.2	3
(Fisherville Supply)	Springs and Deep Tubular Wells	5	–	–	.62	.012	18.5	67	85	.01	.21	6.9	3
(Farnumsville Supply)	Wells	4	–	–	1.07	.002	7.9	49	52	.00	1.27	7.3	3
Granville (Water Co.)	Well and springs	2	–	–	.06	.000	1.6	7	9	.01	.63	6.1	3
Great Barrington (Fire District)	New Infiltration Gallery near Green River	4	–	–	.25	.000	1.7	81	88	.00	.03	7.1	3
Greenfield	Dug Well near Green River	6	–	–	.05	.000	1.8	34	34	–	.14	7.1	2
Groton (Water Co.)	Dug Well	8	–	–	.13	.002	2.4	41	44	–	.15	6.7	3
(West Groton Water Supply District)	Tubular Wells	2	–	–	1.0	.001	3.7	33	29	–	.12	6.3	3
Hamilton	Gravel-Packed and Tubular Wells	7	–	–	.66	.000	14.9	36	32	–	.09	6.2	3
Hanover	Tubular Wells	31	–	–	.09	.000	8.5	26	13	–	1.4	5.8	3
	Gravel-Packed Wells	22	–	–	.15	.000	8.8	25	17	–	.92	5.8	3
Hardwick (Center)	Dug Well	2	–	–	.05	.000	2.7	55	60	–	.06	8.1	3
Hardwick (Gilbertville)	Dug and Tubular Wells	2	–	–	.05	.000	1.9	30	28	–	.05	6.8	3
	New Braintree Well	2	–	–	.06	.002	1.9	14	13	–	.32	6.4	3
	High Street Well	3	–	–	.05	.000	2.7	14	13	–	.19	6.4	3
(Wheelwright)	Tubular Wells	2	–	–	.68	.000	2.7	12	10	–	.04	5.9	3
Harwich	Gravel-Packed Wells	2	–	–	.15	.000	14.1	13	10	–	.08	5.9	3
Hingham (Water Co.)	Filter Galleries	10	.007	.041	.15	–	9.1	44	37	–	.11	9.1	4
	Gravel-Packed Well	2	–	–	.60	.000	15.2	65	51	–	.03	6.6	2
Holliston	Gravel-Packed Wells	3	–	–	.53	.000	3.3	26	21	–	.11	6.3	3
Hopedale	Milford Water Supply												
	Tubular Wells Fruit St.	2	–	–	.35	.002	3.2	23	16	–	.19	6.3	3
	Tubular Wells—Lake Maspenock	7	–	–	.09	.000	3.8	21	21	–	2.5	6.5	2
Hull	Hingham Water Supply												
Hudson	Tubular Wells	8	–	–	.50	.000	5.5	37	40	–	.03	6.5	3
Huntington (Fire District)	Tubular Wells	2	–	–	.18	.000	3.6	29	15	–	.05	6.2	1
Ipswich	Mile Lane G. P. Well	2	–	–	.34	.000	8.4	65	70	–	.04	7.6	2
	Brown, G. P. Well	2	–	–	.75	.000	22.9	134	124	–	.08	7.5	3
Kingston	Tubular Wells	2	–	–	.22	.000	8.4	14	11	–	.09	6.0	3
	Gravel-Packed Well	2	–	–	.04	.000	7.2	11	13	–	.14	6.1	3

Lanesborough (Village Water District)	Tubular Wells—Raw Water	.2			.17	.000	7.0	184	197	–	.03	7.4	3
(Village Water District)	Tubular Wells—Treated Water	3	–	–	.22	.000	4.9	183	210	–	.03	7.3	1
Leicester (Water Supply District)	Dug Wells	11	–	–	.86	.000	2.9	31	25	–	.12	6.5	3
(Cherry Valley and Rochdale Water District)	Dug Wells	20	–	–	.07	.000	7.4	19	15	–	.05	6.6	3
Littleton	Tubular Wells	3	–	–	.38	.000	3.3	25	15	–	.09	6.1	3
Lowell	Boulevard Wells	115	–	–	.43	.012	7.1	35	41	.84	9.0	6.4	3
	Raw Water	93	–	–	.55	.007	6.9	36	41	.93	8.5	6.4	3
	Effluent of Sand Filter	12	–	–	.83	.001	7.1	35	31	.01	.61	6.4	3
	Cook Wells	29	–	–	.10	.000	13.8	45	109	1.4	.88	6.9	2
	New Gravel-Packed Well	16	–	–	.35	.016	10.3	38	37	1.66	13.	6.3	2
Lynnfield Center (Water District)	Tubular Wells	2	–	–	2.2	.000	8.4	128	76	–	.05	7.3	3
Manchester	Dug and Tubular Wells untreated	2	–	–	.63	.000	15.1	35	27	–	.07	6.1	3
	Dug and Tubular Wells treated	5	–	–	.55	.000	14.9	35	33	–	.26	6.4	2
Mansfield	Dug Well	3	–	–	.13	.000	3.4	16	10	–	.06	5.9	4
Marblehead	Tubular Wells—Raw Water	60	–	–	.13	.002	15.2	102	109	–	1.87	6.9	3
	Dug Well—Raw Water	5	–	–	.22	.000	14.7	73	46	.12	.55	6.6	3
Marblehead	Dug and Tubular Wells—Filtered	21	–	–	.18	.000	13.4	51	33	.01	.13	6.8	3
Marion	Old Tubular Wells	4	–	–	.35	.000	7.6	17	9	.00	.04	5.7	4
	New Gravel-Packed Wells	2	–	–	.15	.000	6.1	7	8	.00	.03	5.8	2
Marshfield (Main Supply)	Tubular Wells	3	–	–	.05	.000	8.8	7	12	–	.85	6.2	2
(Parsonage Street Supply)	Tubular Wells	2	–	–	.05	.000	98.3	50	16	–	.69	5.9	2
Furnace Brook Pumping Station	Gravel-Packed Well	2	–	–	.09	.000	8.9	19	18	–	.04	6.4	3
Mattapoisett	Tubular Wells—Old Pumping Sta.	3	–	–	.27	.000	8.5	24	16	–	.14	6.0	3
	Tubular Wells—New Pumping Sta.	2	–	–	.14	.000	10.8	26	23	–	.13	6.2	4
Medfield (Supplied from State Hospital)	Tubular Wells	3	–	–	.10	.000	4.5	44	40	–	.06	7.0	3
Medway	Tubular Wells	2	–	–	.57	.000	6.8	40	36	–	.03	6.6	3
Merrimac	Tubular Wells	8	–	–	.16	.000	6.4	30	24	–	.37	6.1	4
Middleborough	Dug Well—Raw Water	18	–	–	1.6	.003	9.7	32	18	.58	2.3	5.9	3
	Dug Well Filtered (Final Effluent)	6	–	–	1.7	.000	9.4	25	17	.00	.19	6.5	3
Milford (Water Co.)	Outlet of Filters	17	–	–	.13	.000	4.4	30	24	–	.39	7.7	3
(Water Co.)	New Wells	5	–	–	.11	.000	3.6	27	25	–	2.0	6.1	3
Millbury (Water Co.)	Dug Well	2	–	–	.43	.000	4.0	23	10	–	.04	5.5	3
Millis	Dug Wells	2	–	–	2.5	.000	10.3	60	35	–	.04	6.6	3
Monson	Old Dug Well	23	–	–	.08	.000	2.3	9	10	–	.10	6.4	3
	New Dug Well	2	–	–	.10	.000	1.7	13	10	–	.03	6.0	3
Montague (Montague Village)	Springs	4	–	–	.18	.000	2.1	28	25	–	.18	6.8	2
Nantucket (Wannacomet Water Co.)	Dug and Tubular Wells at Wyers Valley	3	–	–	.18	.000	19.5	21	16	–	.03	6.5	3
(Siasconset)	Dug Wells	3	–	–	.16	.000	17.	20	19	–	.21	6.3	4
Natick	Dug Well	3	–	–	.35	.000	11.5	59	46	–	.03	6.8	2
Needham	Dug Well No. 1	2	–	–	2.7	.000	10.3	44	18	–	.03	6.0	3
	Dug Well No. 2	2	–	–	2.3	.000	10.0	42	20	–	.06	6.2	3
	Gravel-Packed Well (Charles River Street)	2	–	–	.90	.000	8.5	49	51	–	.03	6.9	3
Newbury (Byfield Water District)	Tubular Wells	2	–	–	.09	.001	11.4	74	105	–	.15	7.9	1
Newton	Treated Water	9	–	–	.30	.002	9.6	32	85	.15	.30	7.2	3
	Dug Well No. 1	3	–	–	.61	.000	8.3	40	37	.03	.03	6.4	3
	Dug Well No. 2	5	–	–	.07	.000	9.2	39	41	.00	.04	6.3	3

Analyses of the Water of Public Water Supplies — Averages of Chemical Analyses of Ground Water Sources for the Year 1949

City or Town	Source	Parts per Million											pH	No. of Samples
		Color	Ammonia		Nitrogen as Nitrates	Nitrites	Chlorides	Hardness	Alkalinity	Mn	Fe			
			Free	Total Albuminoid										
Newton	Dug Well No. 3	5	–	–	.17	.000	9.2	30	29	.01	.03		6.3	3
	Dug Well No. 4	4	–	–	.17	.001	8.9	37	33	–	.03		6.3	3
North Attleborough	Dug Wells	3	–	–	.38	.000	4.9	44	42	–	.33		6.8	3
Northbridge	Tubular Wells (Meadow Pond)	3	–	–	.18	.000	3.5	21	19	–	.65		6.1	2
	Tubular Wells (Cook Allen)	3	–	–	.30	.000	2.7	28	28	–	.06		7.9	2
North Reading	Wilmington Supply													
Norton	Tubular Wells	4	–	–	.09	.000	3.9	14	14	–	.33		6.0	3
Norwood	Tubular Wells—Raw Water	3	–	–	1.2	.000	11.0	44	29	.10	.12		6.6	3
	Tubular Wells—Final Effluent	5	–	–	1.4	.000	10.4	43	29	.02	.05		6.8	2
Oak Bluffs	Spring (Before Treatment)	2	–	–	.06	.000	9.1	7	9	–	.07		6.1	3
	Spring—Treated Water	2	–	–	.08	.000	9.4	41	37	–	.25		7.8	3
Orange	Crystal Spring	10	–	–	.05	.000	1.7	9	10	–	.10		6.4	3
	Gravel-Packed Well	3	–	–	.05	.000	1.7	13	9	–	.43		5.8	3
Oxford (Water Co.)	Tubular Wells	2	–	–	.82	.000	5.9	25	15	–	.04		6.2	3
Palmer (Fire District No. 1)	Tubular Wells	2	–	–	.08	.000	7.0	39	25	–	.20		6.3	1
(Three Rivers)	Cheney Supply Collecting Well	2	–	–	2.0	.000	6.6	40	25	–	.04		0.5	2
Palmer (Three Rivers	Tubular Well	2	–	–	2.1	.002	6.7	40	25	–	.05		6.6	2
(Bondsville Water Co.)	Tubular Wells	2	–	–	.42	.000	2.3	25	19	–	.29		6.3	3
(Thorndike)	Kelly Spring	3	–	–	.05	.000	2.2	11	14	–	.11		6.4	2
Paxton	Spring	4	–	–	.08	.000	1.9	13	13	–	.73		6.5	3
Pepperell	Tubular Wells	4	–	–	.07	.000	1.9	14	12	–	.03		6.0	3
Plymouth	Tubular Wells	2	–	–	.05	.000	10.6	6	7	–	.03		5.9	1
Provincetown	Tubular Wells	2	–	–	.04	.000	111.	61	11	–	.14		6.1	3
	Gravel-Packed Wells	17	–	–	.18	.000	29.5	28	24	.01	.65		7.1	3
Reading	New Tubular Wells—Raw Water	33	–	–	.26	.004	17.9	50	32	.45	2.3		6.1	3
	New Tubular Wells—Filtered Water	18	–	–	.24	.000	18.3	49	30	.00	.29		6.8	3
Rockport	Tubular Wells—Raw Water	2	–	–	.23	.000	16.5	24	11	–	.04		5.9	3
	Tubular Wells—Treated Water	2	–	–	.24	.000	16.9	28	16	–	.04		6.3	3
Salisbury (Water Supply Co.)	New Dug Well and Gravel-Packed Well	4	–	–	.07	.000	6.5	39	40	.06	.81		6.7	4
Scituate	Webster Meadow Wells	3	–	–	.35	.000	28.9	40	28	–	.14		6.6	3
	Kent Street Wells	2	–	–	.30	.000	33.	23	18	–	.03		6.5	1
	Stearns Meadow Well	2	–	–	.10	.000	12.4	21	23	–	.03		6.5	1
Seekonk	Tubular Wells	2	–	–	1.2	.001	5.9	63	45	.00	.03		6.6	3
Sharon	Dug Well and Tubular Wells	2	–	–	2.2	.002	13.9	71	66	–	.11		7.2	6
	Tubular Wells	3	–	–	1.7	.000	6.5	28	24	–	.05		6.3	2
Sheffield (Water Co.)	Smith Spring	2	–	–	.13	.000	1.6	19	21	–	.05		6.3	2
(Water Co.)	Red Rock Spring	2	–	–	.15	.000	1.4	17	22	–	.05		6.4	2
Shelburne Falls Fire District	Tubular Wells	2	–	–	.38	.000	2.6	38	41	–	.08		6.4	2
Shirley (Shirley Village Water District)	Dug Wells	2	–	–	1.6	.000	8.3	31	13	–	.04		6.0	3

Shrewsbury	Gravel-Packed Wells (South Street)	5	–	–	.77	.000	5.3	24	15	–	.10	5.7	3
	Gravel-Packed Wells (Oak Street)	4	–	–	.37	.000	5.1	26	19	–	.05	6.0	3
Somerset	Tubular Wells	34	–	–	.10	.001	11.3	33	90	–	2.9	7.7	3
	High Street—Gravel-Packed Well	3	–	–	3.5	.000	353.	128	98	–	.03	7.8	3
	Grove Street—Gravel-Packed Well	2	–	–	2.9	.000	9.0	33	74	–	.06	7.8	3
South Hadley (Fire District No. 2)	Dug Wells	3	–	–	.12	.000	4.1	33	27	–	.04	6.8	3
Sterling	Tubular Wells	2	–	–	.31	.000	6.1	33	23	–	.04	6.2	3
Stockbridge(Hill Water Co.)	Springs	4	–	–	.07	.000	1.3	43	45	–	.03	7.3	3
Stoughton	Collecting Well System	4	–	–	.06	.000	3.5	12	9	–	.09	5.8	4
Sturbridge	Tubular Wells	5	–	–	.13	.000	3.4	25	19	–	.73	6.1	3
Sudbury	Tubular Wells	2	–	–	.14	.000	3.8	29	27	–	.03	6.8	4
Sutton (Water Co.)	Dug and Tubular Wells	4	–	–	4.5	.000	8.9	48	22	–	1.75	6.1	3
Tisbury	Tashmoo Spring	2	–	–	.07	.000	11.3	9	9	–	.03	5.8	3
Topsfield	Dug and Tubular Wells	3	–	–	.17	.000	11.2	73	79	–	.23	6.9	3
Townsend	Tubular Wells	2	–	–	.13	.000	1.5	7	8	–	.04	5.7	3
Upton (West Upton)	Tubular Wells	3	–	–	.65	.000	5.3	28	16	.00	.09	6.1	2
Uxbridge	Gravel-Packed Well	3	–	–	.45	.000	4.9	22	18	.18	.05	6.0	3
Wakefield	Tubular Wells	6	–	–	1.4	.001	12.4	53	29	.18	.27	6.2	3
	Dug Well	3	–	–	.93	.000	6.0	62	44	.06	.22	6.6	3
Walpole	Tubular Wells	4	–	–	.59	.000	5.4	26	22	.18	.36	6.1	3
WALTHAM	Old Dug Well	18	–	–	.14	.003	9.0	52	65	.75	3.8	6.5	2
	New Dug Well	3	–	–	.50	.000	7.9	41	23	.00	.03	6.2	2
Ware	Large Well—Treated Water	2	–	–	.93	.000	3.9	28	32	.00	.04	6.6	3
Wareham (Wareham Fire District)	Gravel-Wall Wells	2	–	–	.08	.000	6.9	8	8	–	.05	5.6	4
Warren (Warren Water District)	Tubular Wells	2	–	–	.17	.000	2.3	13	13	.10	.07	6.1	3
Warren (West Warren Water Co.)	Dug Wells	24	–	–	.18	.002	1.5	20	13	–	.73	5.9	2
Wayland	Gravel-Packed Well and Tubular Wells	3	–	–	1.03	.000	6.7	51	34	.12	.14	6.5	3
Webster	Tubular Wells	2	–	–	.17	.000	3.3	19	17	.08	.15	6.3	3
Wellesley	Tubular Wells	3	–	–	1.1	.000	11.9	44	35	.01	.05	6.3	3
	Pumping Station No. 1	3	–	–	1.6	.000	12.8	49	36	.01	.05	6.4	3
	Dug Well at Pumping Station No. 2	2	–	–	1.1	.000	7.5	34	27	.00	.07	6.4	3
	Large Tubular Well at Pumping Station No. 3	3	–	–	.60	.003	6.0	31	22	–	.28	6.3	1
	Gravel-Packed Well at Pumping Station No. 4	3	–	–	.25	.002	7.3	44	40	.06	.05	6.8	2
Wenham	Tubular Wells	8	–	–	.42	.001	11.3	60	61	.00	.53	7.1	6
Westborough	Filter Basin	8	–	–	.04	.000	3.1	12	10	–	.06	6.6	3
West Boylston	Gravel-Packed Well	2	–	–	1.2	.000	4.4	25	18	–	.03	6.1	3
West Brookfield	Tubular Wells	4	–	–	.09	.000	3.1	15	46	.08	.81	7.3	3
Westford (Water Co.)	Tubular Wells	2	–	–	.07	.000	2.4	21	27	.00	.05	6.7	3
(Brookside)	Tubular Wells	2	–	–	.40	.000	3.3	29	28	.00	.04	6.4	3
Weston	Tubular Wells at Kendal Green	5	–	–	.62	.001	5.2	26	17	.00	.47	6.2	3
	Tubular Wells at Warren Ave.	2	–	–	.50	.004	9.6	57	39	.00	.03	6.4	1
	Gravel-Packed Well at Nickerson Field (Keewaydin Water Works)	2	–	–	1.3	.001	9.5	46	33	.00	.03	6.4	3
	Dug Well	3	–	–	.77	.000	5.5	34	22	.00	.09	6.2	3
	(Water Co.) Dug Well A	5	–	–	.90	.000	10.6	49	32	–	.25	6.3	1
West Stockbridge	(East Mountain Water Co.) Johnson's Spring	3	–	–	.10	.000	2.6	50	50	–	.04	6.8	1
West Stockbridge	(East Mountain Water Co.) Sartori Spring	3	–	–	.20	.000	1.2	109	151	–	.04	7.3	1
	(East Mountain Water Co.) New Spring	2	–	–	.10	.000	1.0	29	27	–	.05	7.1	1

Analyses of the Water of Public Water Supplies — Averages of Chemical Analyses of Ground Water Sources for the Year 1949

City or Town	Source	Parts per Million												No. of Samples
		Color	Ammonia: Free	Ammonia: Total Albuminoid	Nitrogen as Nitrates	Nitrates	Chlorides	Hardness	Alkalinity	Mn	Fe	pH	
Whately (Craft Supply)	Springs	3	–	–	6.5	.000	3.9	57	31	–	.56	6.4	2
Williamston (Water Co.)	Cold Spring	2	–	–	.01	–	1.4	134	129	–	–	7.7	1
	Sherman Spring	4	–	–	.08	.000	1.0	61	60	–	.04	7.7	3
Wilmington	Tubular Wells	5	–	–	.30	.000	5.5	29	20	–	.10	6.1	4
Winchendon	Old Dug Well	19	–	–	.07	.002	2.0	13	9	.12	1.7	5.6	3
	New Dug Well	17	–	–	.07	.000	1.4	13	5	.10	.46	5.4	3
Woburn	Dug Well	8	–	–	.18	.003	12.1	52	41	–	.08	7.2	3
	Gravel-Packed Well A	10	–	–	.13	.001	12.2	55	46	–	.25	6.7	3
	Gravel-Packed Well A-2	5	–	–	.20	.000	11.5	57	49	–	.04	6.8	3
	Gravel-Packed Well B	4	–	–	.06	.000	11.7	52	39	–	.03	6.5	3
	Gravel-Packed Well D	3	–	–	.16	.000	8.4	39	28	–	.03	6.3	2
Woburn	Gravel-Packed Well E	3	–	–	2.3	.000	12.5	59	28	–	.04	6.2	3
Worthington (Fire District)	Springs	3	–	–	1.8	.010	5.4	25	15	–	.10	6.8	2
Wrentham	Large Tubular Wells	2	–	–	1.2	.000	3.5	23	12	–	.07	6.0	3
	Gravel-Packed Wells	2	–	–	.39	.000	4.0	17	12	–	.10	5.9	3
Yarmouth	Gravel-Wall Wells	2	–	–	.08	.000	14.5	16	9	–	.04	5.8	3

Analyses of the Water of Public Water Supplies — Averages of Chemical Analyses of Surface Water Sources for the Year 1949

City or Town	Source	Parts per Million												
		Color	Ammonia: Free	Ammonia: Total Albuminoid	Nitrogen as Nitrates	Nitrites	Chlorides	Hardness	Alkalinity	Mn	Fe	pH	No. of Samples
Metropolitan Water District	Quabbin Reservoir	7	.005	.090	.04	–	1.9	10	9	–	–	6.7	3
	Wachusett Reservoir—upper end	18	.002	.099	.02	–	2.8	17	10	–	.11	6.6	3
	Wachusett Reservoir—lower end	10	.010	.092	.03	–	2.5	14	9	–	.05	6.7	3
	Sudbury Reservoir	11	.005	.097	.03	–	3.2	17	10	–	.06	6.7	3
	Framingham Reservoir No. 3	12	.006	.081	.02	–	3.8	17	11	–	.06	6.7	3
	Ware River below Barre Wool	37	.714	.335	–	–	9.1	–	28	–	.86	6.7	4
	Hopkinton Reservoir	37	.004	.115	.03	–	4.4	16	8	–	.22	6.4	3
	Ashland Reservoir	44	.013	.134	.05	–	4.5	17	8	–	.12	6.4	3
	Framingham Reservoir No. 2	75	.103	.168	.10	–	37.3	27	7	–	1.1	5.4	3
	Lake Cochituate	15	.028	.138	.12	–	9.3	25	20	–	.15	7.0	3
	Chestnut Hill Reservoir	11	.098	.095	.03	–	4.4	17	9	–	.09	6.7	4
	Weston Reservoir	11	.007	.089	.03	–	3.4	18	10	–	.06	6.7	3
	Spot Pond	11	.069	.069	.03	–	3.0	14	9	–	–	6.6	3
	Tap in State House	5	.008	.041	.07	–	4.5	21	14	–	.04	6.9	3
	Tap in Revere	10	.016	.062	.06	–	3.7	15	9	–	.32	6.6	4
	Tap in Quincy	8	.007	.057	.09	–	4.5	16	10	–	.12	6.5	3
Abington	Big Sandy Pond	8	.017	.117	.02	–	8.9	17	10	–	.29	6.7	3
Acushnet (Fire and Water District)	New Bedford Water Supply												
Adams (Fire District)	Bassett Brook Reservoir	4	.014	.078	.07	–	1.8	25	24	–	.03	7.0	3
Agawam	Springfield Water Supply (Cobble Mt. Supply)												
Amherst	Atkins Pond	12	.011	.117	.02	–	1.9	11	5	–	.10	6.1	3
	Intake Reservoir—Amethyst Brook	26	.003	.086	.04	–	1.9	15	7	–	.07	6.3	3
Andover	Haggett's Pond	11	.007	.117	.06	–	6.8	28	17	–	.07	7.4	3
Arlington	Metropolitan Water Supply												
Ashburnham	Upper Naukeag Lake	7	.002	.038	.01	–	1.8	8	4	–	.19	5.2	3
Ashfield (Water Company)	Highland Spring Reservoir	17	.003	.060	.05	–	1.5	30	26	–	.11	6.8	3
Athol	Buckman Brook Reservoir (Newton Reservoir)	19	.016	.144	.03	–	1.8	12	6	–	.11	6.1	3
	Thousand Acre Meadow Brook	123	.015	.166	.06	–	1.9	21	6	–	.15	5.2	3
	Phillipston Reservoir	39	.021	.175	.12	–	4.4	15	6	–	.23	5.9	3
	Raw Water at Filter Plant	41	.028	.268	.05	–	3.2	21	11	–	.48	6.7	3
	Final Effluent	6	.066	.055	.02	–	3.1	21	24	–	.04	8.7	3
Barre	Reservoir	7	.084	.224	.03	–	4.4	14	10	–	.04	6.3	3
Belmont	Metropolitan Water Supply												
Beverly	Joint Supply with Salem												
Blackstone	Woonsocket Supply	16	.010	.069	.02	–	4.9	12	6	–	.29	5.6	4
Blandford (Fire District)	Freeland Brook	6	.001	.013	.12	–	2.3	12	12	–	.07	6.8	3
Boston	Metropolitan Water District												

Analyses of the Water of Public Water Supplies — Averages of Chemical Analyses of Surface Water Sources for the Year 1949

City or Town	Source	Parts per Million											pH	No. of Samples
		Color	Ammonia		Nitrogen as Nitrates	Nitrites	Chlorides	Hardness	Alkalinity	Mn	Fe			
			Free	Total Albuminoid										
Braintree	Great Pond—Raw Water	16	.019	.163	.12	–	9.7	21	11	–	.21		6.7	4
	Great Pond—Filtered	2	.031	.073	.12	–	9.7	27	12	–	.06		6.9	3
Brockton	Silver Lake	8	.001	.099	.02	–	6.7	11	6	–	.07		6.4	3
Brookfield	Cooley Hill Reservoir	7	.006	.198	.02	–	2.0	13	8	–	–		6.3	1
Cambridge	Upper Hobbs Brook Reservoir	45	.003	.241	.10	–	6.8	29	17	–	.25		6.8	2
	Lower Hobbs Brook Reservoir	11	.005	.164	.02	–	6.7	28	15	–	.05		6.9	2
	Stony Brook Reservoir	30	.019	1.59	.06	–	8.4	37	22	–	.28		6.9	2
	Fresh Pond	16	.009	.090	.11	–	14.1	48	30	–	.06		7.1	3
	Filter Effluent	3	.002	.037	.20	–	11.6	54	26	–	.12		7.9	3
Chelsea	Metropolitan Water Supply													
Cheshire (Water Co.)	Kitchen Brook Reservoir	2	.014	.010	.04	–	1.0	42	42	–	.04		7.2	2
Chester	Austin Brook Reservoir	12	.016	.065	.02	–	1.2	20	14	–	.04		6.8	2
	Horn Pond	11	.016	.067	.01	–	1.2	17	13	–	.04		6.8	2
Chicopee	Cooley Brook Reservoir—Raw Water	34	.031	.124	.43	–	2.7	22	17	–	.23		6.7	3
	Cooley Brook Reservoir—Filtered	4	.003	.023	.37	–	4.5	34	19	–	.04		8.7	3
	Morton Brook Reservoir	7	.013	.025	.87	–	3.3	23	12	–	.23		6.6	3
Clinton	Lower Lynde's Reservoir	10	.015	.105	.02	–	3.0	15	13	–	.06		6.6	3
	Heywood Pond	14	.013	.111	.03	–	2.3	9	6	–	.06		6.2	3
	Spring Basin	7	–	–	.16	.001	3.5	21	21	–	.04		7.1	3
	Wachusett Reservoir	8	.000	.070	.04	–	3.8	14	9	–	.04		6.6	3
Colrain (Fire District No. 1)	Mountain Brook Reservoir	3	.006	.026	.01	–	2.0	46	45	–	.07		7.3	1
Concord	Nagog Pond	5	.009	.079	.02	–	4.0	11	8	–	.06		6.5	3
Dalton	Egypt Brook Reservoir	22	.006	.061	.07	–	1.2	12	5	–	.08		5.9	3
	Windsor Reservoir	22	.016	.081	.02	–	1.4	27	21	–	.14		6.9	3
	Raw Water	23	.012	.074	.04	–	1.3	21	12	–	.13		6.6	3
	Filtered Water	17	.004	.051	.05	–	1.3	22	14	–	.06		6.6	3
Danvers	Middleton Pond	50	.023	.212	.05	–	4.4	20	11	–	.12		6.6	4
Dartmouth	New Bedford Water Supply													
Deerfield (South Deerfield Water Supply District)	Roaring Brook Reservoir	17	.001	.039	.04	–	2.3	34	28	–	–		7.1	3
East Bridgewater	Brockton Water Supply													
East Longmeadow	Springfield Water Supply (cobble Mt. Supply)													
Egremont (South Egremont Water Co.)	Goodale Brook Reservoir	2	.002	.004	.05	–	1.3	29	29	–	–		7.2	2
Erving (Millers Falls Fire and Water District)	Montague (Turner Falls Fire District) Water Supply													
Everett	(Metropolitan Water Supply)													

Fall River	North Watuppa Lake	7	.005	.073	.01	–	5.7	11	4	–	.25	5.5	3
Falmouth	Long Pond before Lime Treatment	4	.010	.073	.01	–	10.5	5	7	–	.04	6.5	3
	Long Pond—Treated	6	.049	.065	.01	–	10.7	12	12	–	.12	8.6	3
Fitchburg	Ashby Reservoir	16	.011	.097	.03	–	2.2	6	4	–	.12	5.8	3
	Scott Reservoir	13	.184	.104	.05	–	2.2	7	5	–	.04	6.4	3
	Meeting house Pond	6	.009	.100	.02	–	2.3	8	6	–	.04	6.2	3
	Wachusett Lake	9	.005	.105	.02	–	2.2	8	9	–	.08	6.4	3
	Falulah Brook	17	.011	.065	.03	–	2.4	7	5	–	.04	5.6	3
	Lovell Reservoir	15	.028	.155	.04	–	2.0	6	5	–	.08	5.8	3
Gardner	Crystal Lake	12	.008	.092	.02	–	3.7	22	15	–	.15	6.7	3
Gloucester	Haskell Reservoir	6	.012	.060	.01	–	9.3	7	3	–	.20	5.1	3
	Dike's Brook Reservoir	18	.010	.109	.02	–	10.5	11	3	–	.21	5.1	3
	Wallace Reservoir	13	.031	.101	.02	–	21.3	15	5	–	.37	5.7	3
	Babson Reservoir	39	.013	.129	.03	–	14.	16	5	–	.47	5.6	3
Great Barrington (Housatonic Water Works Co.)	Long Pond—Raw Water	8	.015	.126	.02	–	1.6	55	53	–	.06	7.4	3
	Filtered Water	5	.001	.030	.05	–	1.3	61	56	–	.03	7.1	3
(Fire District)	East Mountain Reservoir	5	.003	.051	.02	–	1.3	46	43	–	.04	7.7	3
Greenfield Filter Plant	Raw Water	8	.003	.031	.04	–	2.0	37	32	–	.06	7.1	3
Filter Plant	Filtered Effluent	3	.003	.015	.04	–	2.3	35	31	–	.03	7.1	3
Groveland	Haverhill Water Supply—Johnson's Pond												
Hadley (Water Supply District)	Hart's Brook Reservoir	6	.006	.071	.01	–	2.3	20	19	–	.14	6.9	3
Hanson	Brockton Water Supply												
Hatfield	Running Gutter Brook Reservoir	3	.004	.044	.77	–	2.2	36	25	–	–	7.3	3
Haverhill	Millvale Reservoir	38	.007	.221	.13	–	5.9	27	17	–	–	6.8	3
	Johnson's Pond	13	.007	.159	.03	–	5.7	31	23	–	–	7.0	3
	Crystal Lake	18	.079	.124	.03	–	5.4	22	15	–	–	6.8	3
	Pentucket Lake	10	.034	.198	.02	–	5.0	21	19	–	–	7.1	3
	Kenoza Lake	23	.027	.152	.04	–	5.4	23	17	–	–	6.9	3
Hingham (Water Co.)	Accord Pond	15	.011	.069	.02	–	7.3	9	4	–	.21	6.0	4
Hinsdale (Fire District)	Reservoir	4	.005	.019	.05	–	0.9	6	4	–	.14	5.2	3
Holbrook	Joint Supply with Randolph												
Holden	Rutland Water Supply	14	.008	.062	.02	–	5.2	17	12	–	–	7.0	3
Holyoke	Hugh McLean Reservoir	20	.021	.127	.02	–	2.0	16	10	–	.11	6.6	3
	Carmody Reservoir	8	.015	.129	.02	–	2.4	21	11	–	.39	6.7	3
	Wright and Ashley Ponds	10	.013	.117	.01	–	2.5	25	20	–	.06	6.9	3
	White Reservoir	16	.016	.124	.02	–	1.7	17	9	–	.14	6.6	3
	Whiting Street Reservoir	5	.023	.133	.01	–	3.5	34	27	–	.04	7.1	3
Hopedale	Milford Water Supply												
Hudson	Gates Pond	11	.006	.112	.02	–	2.9	16	11	–	.16	6.8	3
Hull	Hingham Water Supply												
Huntington (Fire District)	Cold Brook Reservoir	8	.006	.017	.06	–	2.0	20	11	–	.12	6.4	3
Ipswich	Dow's Brook Reservoir	21	.031	.185	.03	–	9.2	25	17	–	.11	6.8	3
	Bull Brook Reservoir	108	.025	.233	.10	–	9.7	31	19	–	.23	6.6	3
Lancaster	Clinton Water Supply												
Lawrence	Merrimack River	47	.338	.335	.295	.007	9.0	25	15	.081	.36	6.6	11
	Merrimack River (Filtered)	17	.121	.105	.174	.002	10.2	33	13	–	.46	6.8	11
Lee	Codding Brook, Upper Reservoir	4	.003	.045	.02	–	1.3	23	14	–	–	6.9	3
	Codding Brook, Lower Reservoir	4	.001	.023	.02	–	1.5	27	20	–	–	7.0	3
	Basin Pond Brook	35	.003	.104	.05	–	1.9	29	16	–	–	6.8	3
Lenox (Water Co.)	Lower Root Reservoir	7	.004	.033	.04	–	1.2	52	57	–	–	7.5	3
(Water Co.)	Woolsey Reservoir	4	.008	.045	.01	–	1.3	42	43	–	–	7.2	3

Analyses of the Water of Public Water Supplies — Averages of Chemical Analyses of Surface Water Sources for the Year 1949

City or Town	Source	Parts per Million											No. of Samples
		Color	Ammonia		Nitrogen as Nitrates	Nitrites	Chlorides	Hardness	Alkalinity	Mn	Fe	pH	
			Free	Total Albuminoid									
Leominster	Fall Brook Reservoir	8	.008	.075	.02	–	2.3	9	5		.06	5.8	3
	Simonds Pond Raw Water	14	.004	.069	.03	–	2.1	10	5	–	.13	5.4	3
	Simonds Pond Filtered	7	.006	.031	.02	–	2.5	28	20	–	.20	9.4	3
Lexington	Metropolitan Water Supply												
Lincoln	Sandy Pond	6	.004	.096	.01	–	3.1	9	6	–	.03	6.6	3
Longmeadow	Springfield Water Supply (Cobble Mt. Supply)												
Ludlow	Springfield Water Supply (Ludlow Reservoir Supply)												
Lunenburg	Leominster Water Supply	11	.605	.041	.02	–	2.3	21	16	–	.58	9.4	3
Lynn	Breeds Pond	29	.043	.147	.07	–	11.1	35	20	–	.22	7.0	3
	Birch Pond	20	.020	.144	.09	–	9.6	27	14	–	.10	6.8	3
	Hawkes Pond	73	.007	.251	.12	–	10.4	40	23	–	.08	6.8	3
	Walden Pond	56	.032	.221	.11	–	12.2	34	18	–	.15	6.8	3
Lynnfield (Water Dist.)	Lynn Water Supply												
Malden	Metropolitan Water Supply												
Manchester	Gravel Pond—Raw Water	6	.003	.063	.01	–	9.1	11	6	–	.06	6.6	3
	Gravel Pond—Treated Water	7	.005	.081	.01	–	9.9	11	11	–	.06	7.3	3
Marlborough	Lake Williams	5	.023	.147	.02	–	12.8	33	21	–	.06	7.0	3
	Millham Brook Reservoir	35	.007	.195	.03	–	7.2	24	12	–	.45	6.7	3
Maynard	White Pond	4	.009	.071	.02	–	3.8	10	7	–	.04	6.9	4
Medford	Metropolitan Water Supply												
Melrose	Metropolitan Water Supply												
Methuen	Lawrence Water Supply												
Middleton	Joint Supply with Danvers												
Milford (Water Co.)	Charles River — inlet to Filters	35	.010	.101	.09	–	4.1	15	7	–	.34	6.0	3
(Water Co.)	Dug Well&Charles River Filtered	17	–	–	.13	.000	4.4	30	24	–	.39	7.7	3
Milton	Metropolitan Water Supply												
Monroe (Water District)	Phelps Brook Reservoir	12	.005	.042	.04	–	1.0	14	6	–	.04	6.5	3
	Filtered Water	3	.002	.007	.04	–	1.7	18	10	–	.04	6.8	3
Montague (Turner Falls Fire District)	Lake Pleasant	5	.015	.043	.01	–	2.0	13	8	–	.03	6.5	3
Monterey (Water Co.)	Reservoir	6	.001	.019	.02	–	2.3	79	72	–	.10	7.2	3
Nahant	Metropolitan Water Supply												
New Bedford	Great Quittacas Pond	31	.001	.115	.03	–	5.5	8	6	–	.08	6.2	3
	Little Quittacas Pond	23	.001	.115	.02	–	5.7	11	7	–	–	6.5	6
Newburyport	Artichoke River	33	.011	.196	.06	–	6.5	27	26	–	.60	6.9	3
	Mixed Raw Water	26	.104	.267	.23	–	7.1	29	28	–	.97	6.7	3
	Ground and Reservoir Water, Filtered	13	–	–	.31	.000	8.0	30	26	–	.12	6.5	3

North Adams	Broad Brook	8	.003	.028	.06	–	1.1	24	18	–	.04	7.0	3
	Notch Brook Reservoir	6	.004	.055	.03	–	0.9	55	48	–	.11	7.4	3
	Mt. Williams Reservoir	6	.004	.053	.03	–	1.3	48	45	–	.05	7.5	3
Northampton	Middle Reservoir (Roberts Meadow Brook)	16	.005	.098	.03	–	2.1	20	19	–	.12	7.0	3
	Mountain St. Reservoir	6	.007	.051	.02	–	1.5	18	18	–	.06	6.9	3
North Andover	Great Pond	12	.008	.134	.02	–	5.5	24	17	–	.05	8.6	33
Northborough	Lower Reservoir (Cold Harbor Brook)—Raw Water	61	.009	.117	.03	–	3.1	15	13	–	.22	6.3	3
	Lower Reservoir (Cold Harbor Brook)—Final Effluent	4	.002	.018	.03	–	2.9	15	21	–	.04	6.6	3
North Brookfield	Doane Pond	24	.031	.144	.04	–	2.8	12	9	–	.28	6.3	4
	North Pond	25	.018	.159	.04	–	2.4	11	8	–	.17	6.2	4
Northfield (Water Co.)	Minot Brook Reservoir	9	.001	.006	.02	–	1.2	14	12	–	–	6.8	2
(Northfield Schools, Inc.)	Upper Reservoir on Louisiana Brook	9	.001	.036	.02	–	1.7	14	13	–	–	7.0	2
Northfield (Water Co.) (Northfield Schools, Inc.)	Lower Reservoir on Louisiana Brook	9	.001	.042	.01	–	1.4	16	16	–	–	7.7	2
Norwood	Buckmaster Pond—Raw Water	10	.076	.172	.47	–	12.7	26	12	–	.07	6.7	3
	Buckmaster Pond—Filtered Water	9	.042	.038	.56	–	12.7	26	13	–	.33	6.5	3
Orange	Coolidge Brook Reservoir	22	.003	.048	.03	–	1.8	10	8	–	.06	6.4	3
Palmer (Fire District No. 1)	Graves Brook Lower Reservoir	11	.010	.067	.03	–	2.0	14	12	–	.52	6.7	3
	Thorndike-Hamilton Reservoir	9	.001	.015	.01	–	2.5	16	16	–	.08	6.7	3
Peabody	Spring Pond	20	–	–	.22	.004	13.9	25	15	–	.27	6.9	3
	Suntaug Lake	30	.031	.156	.17	–	14.6	28	13	–	.07	6.8	3
Pembroke	Brockton Water Supply												
Pittsfield	Sackett Reservoir	11	.013	.057	.04	–	1.6	53	46	–	.08	7.2	3
	Hathaway Brook Reservoir	7	.007	.027	.01	–	1.6	78	69	–	.03	7.7	3
	Ashley Reservoir	12	.011	.074	.03	–	1.1	40	33	–	.04	7.2	3
	Ashley Lake	8	.011	.145	.02	–	1.2	18	13	–	.04	6.8	3
	Farnham Reservoir	27	.010	.117	.05	–	1.3	15	7	–	.12	6.1	3
	Millbrook Reservoir	22	.012	.076	.06	–	1.4	18	11	–	.12	6.7	3
	Sand Wash Brook	57	.014	.191	.05	–	1.1	13	7	–	.40	5.8	3
Plainville	North Attleborough Water Supply												
Plymouth	Little South Pond	4	.006	.106	.01	–	8.0	7	4	–	.08	5.9	2
	Great South Pond	3	.002	.099	.01	–	7.3	7	5	–	.03	6.3	2
Quincy	Metropolitan Water Supply												
Randolph	Great Pond—Raw Water	14	.009	.124	.19	–	9.5	20	11	–	.22	6.6	3
	Great Pond—Filtered Water	13	.010	.102	.21	–	9.6	20	12	–	.18	6.6	3
Revere	Metropolitan Water Supply												
Rockland	Joint Supply with Abington												
Rockport	Cape Pond—Raw Water	48	.024	.191	.05	–	28.0	16	8	–	.60	5.8	3
	Cape Pond—Filtered Water	6	.025	.057	.06	–	30.0	35	14	–	.13	7.7	3
Russell	Black Brook Reservoir—Raw Water	14	.008	.079	.01	–	1.6	14	11	–	.03	6.5	3
	Black Brook Reservoir—Filtered	5	.004	.010	.02	–	1.4	12	15	–	.03	6.5	3
Rutland	Muschopaug Lake	5	.027	.100	.02	–	4.7	15	8	–	.04	6.4	3
Salem	Ipswich River at Pumping Station—Longham Reservoir	36	.039	.240	.95	–	12.2	59	49	–	.22	6.7	3
	Wenham Lake—Raw	40	.018	.166	.13	–	9.9	32	20	–	.28	6.7	3
	Wenham Lake—Filtered	4	.022	.070	.14	–	9.7	32	11	–	.05	5.9	3
Saugus	Lynn Water Supply												
Shelburne (Shelburne Falls Fire District)	Fox Brook Reservoir	5	.004	.030	.04	–	1.3	35	36	–	–	7.3	3

Analyses of the Water of Public Water Supplies — Averages of Chemical Analyses of Surface Water Sources for the Year 1949

City or Town	Source	Parts per Million												
		Color	Ammonia		Nitrogen as Nitrates	Nitrites	Chlorides	Hardness	Alkalinity	Mn	Fe	pH	No. of Samples
			Free	Total Albuminoid									
Somerville	Metropolitan Water Supply												
Southborough	Sudbury Reservoir	15	.002	.104	.05	–	3.4	13	9	–	.04	6.7	1
Southbridge	Hatchet Brook Reservoir No. 3	12	.021	.073	.02	–	2.5	10	7	–	.10	6.4	4
	Hatchet Brook Reservoir No. 4	8	.034	.104	.02	–	2.4	9	8	–	.12	6.4	4
	Hatchet Brook Reservoir No. 5	16	.010	.081	.02	–	2.2	8	5	–	.06	5.8	4
South Hadley (South Hadley Falls —Fire District No. 1)	Buttery Brook Reservoir	11	.031	.087	.25	–	4.4	18	11	–	.53	6.6	3
(South Hadley Falls—Fire District No. 1)	Leaping Well Reservoir	8	.023	.143	.01	–	2.7	15	13	–	.13	6.7	3
(Fire District No. 2)	Elmer Brook—Raw Water	6	.012	.062	.02	–	2.2	36	28	–	.04	7.0	3
(Fire District No. 2)	Elmer Brook—Filtered Water	4	.002	.033	.02	–	2.3	36	28	–	.04	7.0	3
Southwick	Springfield Water Supply (Cobble Mt. Supply)												
Spencer	Shaw Pond	9	.009	.076	.02	–	2.4	9	6	–	.30	6.4	2
Springfield	Cobble Mt. Reservoir—Raw Water	17	.012	.093	.04	–	1.7	12	7	–	.12	6.4	3
	Cobble Mt. Reservoir—Filtered Water	11	.003	.051	.06	–	1.5	11	7	–	.06	6.4	3
	Ludlow Reservoir—Unfiltered	13	.013	.103	.03	–	2.5	12	9	–	.06	6.7	3
	Ludlow Reservoir—Filtered	8	.006	.083	.03	–	3.1	13	8	–	.02	6.5	3
Stockbridge (Water Co.)	Lake Averic	11	.009	.113	.02	–	1.6	42	44	–	.04	7.2	3
Stoneham	Metropolitan Water Supply												
Stoughton	Muddy Pond Collecting Gallery Tap in P. S.	4	–	–	.06	.000	3.9	17	17	–	.07	6.4	4
Sunderland (Water Co	Saw Mill Brook Reservoir	3	.012	.010	.02	.000	1.9	45	48	–	.08	7.2	3
Swampscott	Metropolitan Water Supply												
Taunton	Assawompsett Pond	18	.067	.159	.03	–	5.8	9	7	–	.08	6.0	3
	Elder's Pond	10	.024	.131	.02	–	5.5	7	6	–	.04	6.1	3
Wakefield	Crystal Lake	13	.007	.114	.13	–	9.2	33	23	–	.08	7.1	3
	Crystal Lake—Filtered	8	.001	.028	.15	–	9.3	33	22	–	.03	6.8	3
Wareham	Onset Fire District, Jonathan Pond	3	.008	.047	.01	–	7.1	6	4	–	.04	6.1	3
Watertown	Metropolitan Water Supply												
West Bridgewater	Brockton Water Supply												
Westfield	Montgomery Reservoir	29	.003	.071	.03	–	1.5	7	6	–	.08	6.1	3
	Gianville Reservoir	10	.013	.055	.01	–	1.6	7	6	–	.07	6.4	3
	Winchell Reservoir	9	.009	.042	.01	–	1.5	9	7	–	.07	6.6	3
Westhampton (Water Co.)	Reservoir	7	–	–	.06	.000	1.7	19	17	.00	.13	6.8	3
West Newbury	Tap in Town—Groveland Supply												
West Springfield	Bear Hole Brook Reservoir—Unfiltered	9	.017	.065	.02	–	2.0	40	41	–	–	7.2	3
	Bear Hole Brook Reservoir—Filtered	3	.002	.014	.01	–	2.0	41	41	–	–	7.1	3
West Stockbridge	(East Mountain Water Co.)	7	.006	.012	.01	–	1.8	27	20	–	–	7.1	1

Weymouth	Great Pond	38	.024	.129	.04	–	7.4	12	5	–	.40	5.3	3
	Great Pond Filtered	3	.008	.051	.04	–	7.7	9	17	–	.03	7.6	3
Wilbraham	Springfield Water Supply												
	Ludlow Reservoir Supply												
Williamsburg	Unquomonk Brook Reservoir	7	.002	.031	.04	–	1.6	20	20	–	.08	7.0	3
Williamstown (Water Co.)	Paul Brook	3	.003	.025	.03	–	1.0	42	42	–	.03	7.3	2
	Rattlesnake Brook Reservoir	6	.003	.009	.02	–	0.9	63	69	–	.03	7.7	3
Winchester	North Reservoir	3	.004	.092	.01	–	5.0	20	10	–	–	6.9	1
	Middle Reservoir	8	.004	.106	.01	–	4.4	16	10	–	–	6.7	1
	South Reservoir	5	.002	.074	.01	–	4.4	18	11	–	–	6.9	1
Winthrop	Metropolitan Water Supply												
WORCESTER	Holden Reservoir No. 1	10	.016	.085	.04	–	2.4	13	7	–	.07	6.4	3
	Holden Reservoir No. 2	8	.013	.098	.03	–	2.7	12	7	–	–	6.5	3
	Kettle Brook Reservoir No. 1	13	.018	.128	.05	–	3.1	15	8	–	–	6.6	3
	Mann Reservoir—Kettle Brook No. 2	16	.002	.069	.06	–	3.1	17	9	–	.04	6.6	2
	Kettle Brook Reservoir No. 3	18	.008	.120	.06	–	3.2	18	7	–	.06	6.4	3
	Bottomley Reservoir (Kettle Brook Reservoir No. 4)	22	.003	.144	.22	–	3.2	18	9	–	.07	6.4	3
	Kendall Reservoir	11	.018	.085	.04	–	2.7	12	7	–	.08	6.4	3
	Leicester Reservoir (Lynde Reservoir)	11	.020	.095	.04	–	3.1	17	10	–	.06	6.6	3
	Pine Hill Reservoir	22	.121	.128	.15	–	3.2	15	9	–	.12	6.6	3
	Quinapoxet Pond	27	.007	.120	.04	–	2.2	10	7	–	.06	6.3	3

Sanitary Protection of Public Water Supplies

Rules and regulations are enforced by the Department through the Division of Sanitary Engineering under the following provisions:

Section 160 of Chapter 111 of the General Laws:

Rules and regulations for protecting the drainage areas and sources of water supply in cities and towns and fire and water districts and water companies.

Rules and regulations relative to cross connections between public water supplies and fire and industrial water supplies.

The following table shows the municipalities having public water supplies protected by rules and regulations adopted under the provisions of Section 160 of Chapter 111 of the General Laws:

Abington and Rockland . . 1927
Adams (Fire District) . . 1921
Amherst 1941
Andover 1908
Ashburnham . . . 1922
Ashfield (Water Company) . 1923
Athol 1934
Attleboro 1926
Barre 1941
Blandford (Fire District) . 1941
Braintree . . . 1910, 1926*
Brockton . . . 1905, 1934
Brookfield 1941
Cambridge 1899
Cheshire (Water Company) . 1933
Chester (Fire District) . . 1914
Chicopee 1906
Clinton 1935
Cohasset (Water Company) . 1923
Colrain (Fire District) . . 1932
Colrain (Griswoldville) . . 1934
Concord 1910
Dalton (Fire District) . . 1919
Danvers and Middleton . 1901, 1920*
Deerfield (South Deerfield Water Supply District) . . 1932
Easthampton . . . 1904
Egremont (South Egremont Water Company) . . 1932
Fall River 1907
Falmouth 1930
Fitchburg 1903, 1907, 1918, 1938*
Franklin (Beaver Pond) . . 1942
Gardner 1910
Gloucester . . . 1930
Great Barrington (Housatonic Water Works Company) 1929, 1936*
Greenfield 1904
Hadley (Water Supply District) 1941
Hatfield 1934
Haverhill 1921
Hingham and Hull (Hingham Water Company) . . 1912
Hinsdale (Fire District) . . 1941
Holden . . . 1914, 1935*
Holyoke . . 1908, 1918, 1948*
Huntington (Fire District) . 1938
Ipswich 1941
Lakeville (State Sanatorium) . 1926
Lee (Berkshire Water Company) 1919
Leicester (Cherry Valley and Rochdale Water District) . 1914
Lenox (Water Company) . 1933
Leominster . . 1919, 1927*
Lincoln and Concord . . 1903
Lynn 1907
Manchester 1934
Marlborough . . . 1901
Maynard 1907
Medfield (State Hospital) . 1922†
Metropolitan Water District 1925, 1940*
Milford (Water Company) . 1924
Monroe (Water District) . 1941
Monson 1941
Montague (Turners Falls Fire District) . . . 1908, 1936*
Montague (Bartlett Supply) . 1941
New Bedford . . . 1932
Newburyport . . . 1921
Norfolk (State Hospital) . 1926
North Adams (Mt. Williams and Notch Brook Reservoir) 1941
Northampton . . . 1904
North Andover . . . 1912
Northborough . . 1905, 1934*
North Brookfield . . . 1935
Northfield (Water Company) . 1941
Northfield (Schools, Inc.) . 1941
Norwood 1901
Orange 1939
Palmer (Fire District No. 1) . 1933
Palmer (Holden Supply) . 1941
Peabody 1922

*Readopted
†Rescinded 1936

Pittsfield (Regular Supplies)	1903	Spencer	1934
(Onota Lake)	1944	Springfield	1904, 1910*
Pittsfield (Junction Water Company)	1941	Stockbridge (Water Company)	1910
Plymouth	1908	Stoughton	1941
Randolph and Holbrook	1926	Sunderland (Water Company)	1941
Rockport	1902	Taunton	1932
Russell	1910	Templeton Colony (Walter E. Fernald State School)	1947
Rutland	1914, 1935*	Wakefield	1904
Salem and Beverly	1901, 1938*	Wareham (Onset Fire District)	1941
Scituate	1927	Westborough	1929
Shelburne and Buckland (Shelburne Falls Fire District)	1941	Westfield	1922
Southbridge (Southbridge Water Supply Company)	1931	Westhampton (Water Company)	1941
South Hadley (Fire District No. 1)	1937	West Springfield	1907
South Hadley (Fire District No. 2)	1941	Weymouth	1903, 1935*
		Williamsburg	1914
		Williamstown	1941
		Winchester	1909
		Worcester	1926

*Readopted

The following table shows the municipalities where the public water supply agency acquired land during the period from January 1, 1941, to June 30, 1949, inclusive:

Acquisition of Land for Protection of Water Supplies

City or Town	Source of Supply	Location of Land	Area of Land in proposed taking (acres)
	1941		
Auburn	Wells	Auburn	2.1
Falmouth	Long Pond	Falmouth	180
Fitchburg	Wachusett Lake	Westminster	13.3
Granville	Wells	Granville	22.4
Marion	Well	Marion	5
Montague	Lake Pleasant	Montague	189
Webster	Wells	Webster	1.3
Weston	Well	Weston	1.6
	1942		
Colrain (F.D. No. 1)	Mountain Brook	Colrain	74
Gardner	Crystal Lake	Gardner	8.75
Ipswich	Brown G. P. Well	Ipswich	8.14
Reading	Driven Wells	Reading	15
Wakefield	Bay State Road	Lynnfield	13.5 } 38.5
		Wakefield	25 }
West Springfield	Bear Hole Brook	Holyoke	58
		West Springfield	
	1943		
Adams (Adams Fire District)	Bassett Brook Reservoir	Cheshire	0.75 ±
Westfield	Montgomery Supply	Montgomery and Westfield	1.0 ±
	Granville Supply	Granville	47.9 ±
	1944		
Barnstable (Barnstable Water Co.)	Tubular well field	Barnstable (Hyannis)	6.0 ±
Concord	Magog Pond	Acton and Littleton	15.0 ±
Gardner	Crystal Lake	Gardner	30.0 ±
Montague (Turners Falls Fire District)	Lake Pleasant	Montague	460.0 ±
Pittsfield	Ashley Lake System	Dalton and Washington	631.0 ±
Salem	Wenham Lake	Beverly	1.1 ±
Sharon	Wells	Sharon	21.0 ±
Spencer	Shaw Pond	Leicester	66.1 ±
	1945		
Salem and Beverly	Wenham Lake	Beverly	1.14 ±
Sharon	Wellfield	Sharon	21.0 ±
New Bedford	Great and Little Quittacas Ponds	Lakeville	143 ±
Tisbury	Lake Tashmoo	Tisbury	5 ±
	1946		
Concord	Nagog Pond	Acton and Littleton	4
Danvers	Middleton Pond	Middleton	1.62
Dennis	Wells	Dennis	34.43
North Andover	Lake Cochichewich	North Andover	1 ±

ACQUISTION OF LAND FOR PROTECTION OF WATER SUPPLIES — Continued

CITY OR TOWN	Source of Supply	Location of Land	Area of Land in proposed taking (acres)
	1947		
Athol	Newton or Buchman Brook Reservoir	Athol	398 ±
Pittsfield	Sackett Brook Reservoir	Washington	760 ±
Shrewsbury	Oak Street wells	Shrewsbury	11 ±
	1948		
Pittsfield	Cleveland Brook Reservoir Construction 1949 to July 1 None	Hinsdale	600 ±

CONSUMPTION OF WATER FOR PROTECTION OF WATER SUPPLIES

The average daily water consumption for each of the years 1941 to 1949, inclusive, in the various cities and towns where records are kept and submitted to the Division and the estimated population and per capita water consumption for the year 1949 are shown in the following table.

Average Daily Consumption of Water in Various Cities and Towns, 1941–1949, inclusive

City or Town	1941	1942	1943	1944	1945	1946	1947	1948	1949		
									Estimated Population	Gallons	Gallons per capita
Metropolitan District											
Arlington	2,278,500	2,234,000	2,335,000	2,542,400	2,446,000	2,710,400	2,551,600	2,652,800	46,757	3,039,200	65
Belmont	1,626,200	1,580,300	1,499,600	1,719,500	1,764,100	2,015,800	2,079,100	2,138,776	30,900	2,225,800	73
Boston	97,767,600	102,100,500	106,046,300	109,622,600	110,676,200	110,950,800	114,958,300	117,480,200	768,726	113,771,500	148
Chelsea	3,554,800	3,831,200	3,865,600	4,086,300	4,275,700	4,336,300	4,033,700	3,860,200	38,500	3,926,000	102
Everett	5,762,300	6,326,100	7,093,700	7,000,400	7,130,500	6,915,500	8,204,900	8,250,500	49,600	7,888,700	159
Lexington	749,700	699,600	821,900	848,600	808,900	879,600	1,052,200	1,043,700	15,460	1,345,000	87
Malden	4,378,500	4,275,600	4,417,600	4,523,300	4,702,200	4,830,200	4,705,700	4,716,200	59,630	4,889,900	82
Medford	3,630,300	3,707,500	3,814,600	4,332,400	4,074,000	4,393,700	3,936,600	3,816,400	69,000	4,003,200	58
Melrose	1,464,500	1,502,600	1,519,400	1,525,000	1,522,600	1,674,600	1,674,300	1,737,100	29,710	1,812,700	61
Milton	1,039,600	1,016,700	1,104,100	1,071,400	984,200	1,099,100	1,143,900	1,307,200	22,564	1,399,000	62
Nahant	252,400	228,200	246,300	250,100	234,000	245,300	247,300	255,700	2,470	308,800	125
Quincy	5,076,000	5,004,400	5,994,000	5,970,800	6,043,900	6,502,900	6,028,200	6,250,200	84,790	6,783,200	80
Revere	1,924,500	2,215,300	2,424,100	2,446,100	2,585,600	2,753,900	2,992,100	2,906,000	36,890	2,767,200	75
Somerville	9,913,000	9,755,400	10,410,300	10,744,300	10,903,100	11,415,800	11,392,700	11,159,900	107,980	11,121,900	103
Stoneham	657,600	629,300	653,300	749,500	643,400	686,800	694,200	835,500	12,820	1,089,700	85
Swampscott	822,100	836,900	892,300	893,200	859,100	961,100	1,024,900	924,400	12,335	999,200	81
Watertown	3,003,500	3,269,600	3,272,800	2,718,700	2,523,400	2,714,700	2,800,900	2,834,000	38,800	2,987,800	77
Winthrop	1,401,900	1,362,000	1,464,700	1,404,300	1,394,700	1,504,300	1,612,810	1,534,700	19,830	1,645,800	83
Abington and Rockland	774,000	798,000	851,600	913,800	911,800	890,000	967,000	1,034,310	15,923	1,212,300	76
Acton	132,000	127,000	129,600	121,900	114,300	135,000	137,848	149,993	3,003	178,300	59
Acushnet	130,000	111,900	110,200	129,400	140,700		254,300	268,600	4,374	285,270	65
Agawam	426,000	464,870	508,000	435,800	441,400	513,100	502,280	524,900	8,882	702,270	79
Amesbury	789,300	775,800	829,000	883,800	931,800	934,800	785,300	793,850	10,824	738,500	68
Amherst	628,600	629,300	678,700	638,100	624,600	741,000	772,517	837,100	7,632	886,700	116
Andover	1,340,500	1,140,600	1,070,000	1,161,600	1,112,000	1,216,000	1,285,900	1,379,800	12,558	1,457,100	116
Ashburnham	91,700	74,100	81,900	78,400		108,400	63,800	92,166	2,381	86,525	36
Ashland	641,000	665,000	690,900	577,400	599,300	683,400	771,440	833,217	3,273	743,900	225
Athol	581,900	628,600	625,100	627,000	702,800	800,600	834,000	936,237	12,303	926,200	75
Attleboro	1,303,534	1,352,900	1,536,300	1,570,700	1,839,200	1,975,000	2,113,700	2,394,024	22,618	2,500,600	110
Avon	147,000	134,000	116,000	108,400	118,800	136,700	138,540	136,667	2,691	155,120	58
Ayer	267,100	398,100	304,500	415,600	486,200	532,700	508,100	258,762	4,283	380,000	89
Barnstable	769,000	752,100	830,800	1,035,600	1,028,000		1,450,000	1,208,610	8,898	1,545,729	174
Bedford	181,200	184,000	178,000	193,500	184,700	176,800	205,033	204,112	4,460	223,400	50
Belchertown	33,400	33,200	33,200	33,200	34,300	49,900	51,700	49,760	3,982	50,426	13
Bellingham	83,000	78,000	92,800	93,900	98,500	114,200	228,400	364,377	3,906	363,000	93
Beverly	1,787,900	1,723,000	1,887,000	1,957,800	1,983,800	2,012,100	2,064,000	2,455,270	27,836	2,402,000	87
Billerica	350,500	309,800	333,000	351,500	382,600	421,700	472,000	488,662	8,961	520,730	58
Blandford	16,800		19,300	19,200	18,800	20,000					
Bourne	148,000	180,300	159,800	191,600	170,900	157,600	200,300	227,000	3,682	266,450	72
Braintree	1,344,000	1,546,000	1,704,000	1,686,900	1,725,500	1,830,500	1,316,700	1,545,240	23,400	1,519,300	65
Bridgewater	235,800	242,400	252,300	270,800	273,000	287,600	302,808	334,563	8,641	326,851	38

Average Daily Consumption of Water in Various Cities and Towns, 1941–1949—Continued

City or Town	1941	1942	1943	1944	1945	1946	1947	1948	1949		
									Estimated Population	Gallons	Gallons per capita
Brockton	3,011,000	2,908,000	3,146,700	3,188,000	3,248,500	3,430,500	4,760,000	3,501,226	67,490	3,670,700	54
Brookfield	41,000	55,000	59,400	49,700		89,300	60,000	111,314	1,390	105,600	76
Brookline	5,032,200	4,831,000	4,956,500	4,999,900	4,998,800	5,197,400	5,264,880	5,350,290	62,663	5,797,400	92
Cambridge	13,750,000	13,434,900	14,852,300	15,215,900	14,920,170	15,013,700	16,124,834	16,300,000	111,320	16,502,000	148
Canton	717,000	857,000	717,300	808,300	832,300	1,134,000	1,210,700	904,981	6,962	860,650	123
Chatham	114,000	109,800	130,200	177,200	182,000	109,000	114,637	126,650	2,237	153,610	68
Chelmsford	350,000	345,200	334,100	394,900	419,200	440,800	448,466	508,963			
Chicopee	3,483,300	3,746,000	3,809,900	4,593,100	4,968,800	4,766,300	4,794,000	5,036,472	46,996	5,312,000	113
Clinton	996,400	1,032,100	1,095,900	1,377,200	869,500	1,093,300		1,330,440	12,973	1,410,100	109
Cohasset	336,000	298,800	353,200	392,600	288,200	347,900	254,070	361,202	3,883	396,600	102
Concord	518,000	458,000	451,600	496,000	476,100	478,100	689,140	682,937	8,710	850,870	98
Danvers and Middleton	1,013,100	1,128,500	1,070,000	1,110,300	1,135,100	1,180,600	1,276,000	1,329,066	14,962	1,406,300	80
Dalton	1,400,000	1,300,000	1,062,300	1,340,800	1,496,300	1,531,700		1,465,082	4,496	1,456,000	324
Dartmouth	216,000	245,700	291,100	313,100	328,700	314,000	337,000	283,500	10,627	387,000	36
Deerfield	42,900	45,000	40,700	44,600	46,000	49,700	49,000	43,710	3,402	45,000	13
Dedham	1,135,000	1,120,800	1,183,800	1,086,600	1,147,400	1,403,800	1,366,000	1,359,156	17,580	1,495,600	85
Douglas	280,600	232,400	127,200	132,400	148,300	151,700	152,935	166,600	2,707	144,438	53
Dracut	269,000	200,300	222,900	222,400	239,800	297,000	294,353	350,718	7,510	377,300	50
Dudley								335,900	4,812	366,000	76
Dunstable	2,835	2,900	3,013	3,140	3,015	3,288	3,500	4,000	440	5,480	12
Duxbury	302,000	273,800	266,800	291,000	310,600	272,400	319,606	324,272	2,490	398,230	160
East Bridgewater	217,000	193,000	228,900	235,000	253,200	319,500	354,000	374,582	4,149	342,400	83
East Brookfield	36,400	34,600	33,000	33,400	57,700	46,100	58,740	60,675	1,113	66,888	60
East Longmeadow	114,500	122,500	387,000	245,100	202,600	181,100	194,000	231,000	4,127	279,400	67
Easthampton	964,100	928,800	1,030,000	1,133,700	1,145,900	1,214,300	905,350	1,417,000	10,788	1,521,700	141
Edgartown	165,500	128,100	136,600	136,000	132,500	167,800	174,110	167,440	1,296	206,780	160
Fairhaven	490,000	527,900	549,500	631,300	661,000	761,800	505,409	916,243	12,979	820,340	63
Fall River	7,505,500	7,567,800	7,472,200	7,520,500	7,998,200	9,089,100	9,601,600	8,751,450	115,062	9,479,000	82
Falmouth	917,885	894,000	897,400	860,400	899,000	897,500	934,300	982,964	8,450	1,054,100	125
Fitchburg	5,474,300	5,307,000	5,041,000	6,585,400	6,237,300	6,687,900	6,796,620	6,925,885	45,327	6,764,900	149
Foxborough	631,000	635,000	719,900	836,300	806,400	931,700	942,390	1,033,781	6,580	1,097,560	167
Framingham	1,568,000	1,583,000	1,774,100	1,923,900	2,105,500	2,314,700	2,478,870	2,972,770	27,332	3,101,000	113
Franklin	465,000	474,200	494,900	523,300	538,200	557,000	562,200	479,657	7,713	511,000	66
Gardner	1,036,700	985,600	1,077,700	1,133,300	1,153,300	1,263,700	1,276,150	1,372,733	20,276	1,356,000	66
Georgetown	49,900	37,000	36,900	43,000	46,800	56,000	65,400	67,800	2,118	72,600	34
Gloucester	1,928,100	1,893,700	1,962,000	2,123,600	2,142,400	2,274,900	2,249,000	2,738,700	25,515	2,750,430	108
Grafton	112,000	270,200	237,300	213,500	184,900	151,100	221,616	169,700	8,380	376,700	45
Great Barrington	445,500	467,600	489,600	472,000	507,600	330,000	489,000	514,000	6,558	471,000	71
Greenfield	1,511,600	1,609,300	1,633,800	1,690,100	1,745,500	1,865,200	1,927,000	1,966,908	18,098	1,858,700	103

Groton	445,000	466,200	541,300	384,700	434,900	523,500	623,786	602,081	3,063	791,000	250
Groveland	46,400	38,000	68,700		88,100	108,000	136,060	150,406	2,172	160,700	74
Hamilton	65,600	63,300	62,000	70,900	67,700	85,000	99,000	113,200	2,667	145,200	54
Hanover	211,000	341,000	492,800	585,800	492,600	328,400	390,220	379,940	3,132	596,400	190
Hanson and Pembroke	144,700	159,300	143,800	158,100	146,100	194,200	172,400	143,060	4,601	169,200	37
Harwich	62,000	55,400	60,000	91,300	104,600	118,800	167,020	200,458	2,071	288,680	139
Haverhill	4,246,300	3,957,000	4,102,700	4,330,800	4,461,800	4,987,000	5,193,000	5,163,800	46,162	5,113,500	111
Hingham and Hull	1,169,100	1,297,500	1,967,400	2,032,800	1,757,300	1,666,301	1,676,000	1,759,300	15,379	1,017,000	66
Holden	81,900	83,000	85,480	95,600	88,200	109,833	129,560	139,416	5,584	167,300	30
Holliston	112,000	101,800	151,600	150,600		143,200	136,320	149,257	3,560	164,000	46
Holyoke	7,531,400	7,569,000	7,993,300	8,242,300	8,372,000	8,516,700	9,086,620	9,892,230	53,795	9,454,000	176
Hudson	456,500	555,000	583,400	595,700	560,700	566,200	578,930	685,366	8,193	726,550	88
Ipswich	330,100	313,800	338,000	361,800	388,200	378,800	435,600	445,910	6,820	501,630	74
Kingston	253,000	238,100	258,600	248,500	275,300	285,680	273,870	307,370	3,033	359,300	118
Lancaster	150,900	179,700	183,900	160,700	120,800	155,900	188,400	213,869	3,096	220,800	71
Lawrence	4,363,700	4,737,500	5,371,000	5,468,400	5,372,900	5,891,000	5,908,300	6,418,400	86,627	6,416,000	74
Leicester	189,600		222,000	236,100	245,700	252,200	242,300	310,400	5,396	327,000	60
Lenox			300,000	299,200	300,000	300,000	300,000	300,000	3,000	300,000	100
Leominster	3,202,200	3,576,200	3,479,954	3,949,800	3,838,700	3,867,400	3,970,000	4,137,000	24,607	4,221,000	171
Lincoln	331,500	275,700	303,500	341,000	298,200	327,438	350,700	339,040	2,170	365,500	168
Littleton	106,100	112,100	127,500	138,700	123,600	160,900	161,700	187,721	1,691	221,880	131
Longmeadow	421,000	382,000	400,500	448,800	394,900	470,300	452,660	531,430	6,908	741,900	107
Lowell	5,686,100	5,790,000	6,016,800	6,152,800	6,103,400	6,438,300	6,131,400	6,753,803	101,230	6,754,000	67
Ludlow	332,400	384,100	472,400	388,800	379,300	411,200	432,600	447,000	8,065	508,600	62
Lunenburg	81,900	90,000	103,700	138,500	80,000	83,000	87,800	108,900	3,027	127,000	41
Lynn	8,773,800	9,840,600	10,336,800	10,457,000	9,958,500	9,512,100	10,485,000	11,279,800	110,777	11,900,000	107
Lynnfield	74,500	71,400	84,900	95,400	89,800	109,490	60,630	130,447	3,428	135,300	39
Manchester	371,300	281,400	272,000	253,600	235,300	280,000	288,100	337,975	2,593	343,380	132
Mansfield	635,000	636,100	794,600	849,200	848,500	944,700	1,006,090	979,120	7,336	960,890	131
Marblehead	853,900	991,100	755,000	843,200	813,500	960,900	1,031,370	1,139,520	13,858	1,232,600	90
Marion	200,000	179,500	171,900	187,700	164,900	175,460	224,640	201,099	2,192	284,286	130
Marlborough	851,300	813,500	747,400	807,400	780,700	836,900	760,280	771,220	16,100	829,900	51
Marshfield	377,000	400,000	427,900	451,000	449,300	432,600	518,348	684,732	2,405	598,500	248
Mattapoisett	100,000	94,600	86,300	108,200	103,400	113,800	309,790	140,800	2,303	138,500	60
Maynard	328,000	364,000	306,400	299,500	295,800	362,600	386,480	360,158	7,181	415,500	58
Medfield	82,000	86,800	96,300	96,500	102,400	114,500	134,011	118,660	4,200	118,100	28
Medway	260,000	284,000	294,300	216,400	154,800	127,800	148,537	137,325	3,416	149,200	44
Merrimac	207,500	211,000	230,000	251,700	264,800	307,800	268,700	265,360	2,435	265,000	109
Methuen	1,081,800	982,800	876,300	952,700	911,700	1,017,000	1,028,000	1,127,300	24,184	1,210,600	50
Middleborough	339,000	340,800	351,100	349,400	344,900	348,300	364,720	429,344	10,047	442,700	44
Milford and Hopedale	922,000	844,300	862,000	934,800	1,065,700	1,208,600	1,155,730	1,103,360	19,611	1,072,200	54
Millbury	370,000	486,100	501,500	505,200	599,800	452,200	432,180	380,000	8,212	530,600	64
Millis	192,000	199,100	196,200	224,800	222,800	252,900	257,150	238,470	2,370	276,000	116
Monson		490,000	554,400	484,600	406,100	434,400	415,260	477,540	5,714	408,400	71
Montague and Erving	912,800	978,100	882,200	913,400	883,700	894,600	858,000	1,464,600	7,618	957,700	125

Average Daily Consumption of Water in Various Cities and Towns, 1941–1949—Continued

City or Town	1941	1942	1943	1944	1945	1946	1947	1948	1949		
									Estimated Population	Gallons	Gallons per capita
Nantucket	466,290	511,300	600,500	563,500	595,900		497,200	707,000	2,870	705,040	245
Natick	955,700	938,000	1,043,800	1,094,900	1,064,000	1,195,600	1,268,000	1,346,590	17,339	1,582,500	90
Needham	769,000	746,000	812,400	918,900	915,100	1,038,300	1,105,900	1,205,730	16,157	1,397,000	86
New Bedford	10,053,000	10,668,000	11,880,600	13,147,600	12,769,000	13,680,300	14,379,450	15,183,143	110,308	15,175,000	137
Newburyport	1,521,800	1,457,500	1,532,000	1,591,400	1,657,200	1,749,780	1,735,550	1,755,360	14,209	1,716,000	120
Newton	5,363,200	5,269,000	5,560,400	5,852,500	5,560,500	6,108,100	6,306,300	6,454,177	82,650	6,913,000	84
North Adams	2,912,300	2,740,100	2,882,100	3,139,300	2,934,200	4,008,100	3,004,530	3,627,000	22,244	3,345,000	150
North Andover	513,200	541,900	501,000	500,700	513,700	570,000	566,400	579,142	8,266	616,700	74
North Attleborough	904,000	841,600	800,400	811,700	841,100	972,400	971,358	1,029,667	12,506	1,071,400	86
Northampton	3,206,900	3,060,000	3,168,200	3,219,700	3,077,300	2,896,000	3,294,000	3,633,347	25,123	3,730,000	148
Northborough	100,600								3,419	129,700	38
Northbridge	772,000	669,400	743,600	824,000	776,600	888,200	991,850	1,046,850	10,212	1,054,470	103
North Brookfield	438,100	357,900	383,000	507,900	421,400	460,400	439,450	460,000	3,121	558,000	178
North Reading	52,500	50,700	47,000	53,600	59,900	70,038	86,670	85,900	3,251	110,900	34
Norton	219,000	235,000	245,500								
Norwood	1,090,700	1,128,300	1,179,200	1,280,000	1,286,800	1,403,900	1,313,420	1,500,000	17,408	1,648,000	95
Oak Bluffs	122,000	116,000	154,800	154,200	134,900	141,700	166,370	186,653	1,345	195,170	145
Orange	127,900	128,400	161,800	260,200	301,200	380,000	498,000	397,552	5,883	313,000	53
Oxford	150,000	157,500	169,300	200,800	186,100	184,000	213,230	240,600	5,341	237,000	45
Palmer	348,300	247,800	239,400	408,200	407,700	409,700					
Paxton	17,400	14,300	14,321	15,400	24,200	17,400	23,040	29,334	897	30,330	34
Peabody	2,825,000	2,800,400	2,680,000	2,889,500	2,780,200	2,981,900	3,372,690	3,179,585	22,777	3,123,400	137
Pepperell	315,300	266,500	323,800	343,800	382,400	372,400	358,480	362,675	3,123	375,400	120
Pittsfield	6,991,200	7,226,400	7,485,000	7,355,300	7,251,400	7,169,220	8,644,400	9,169,571	56,661	8,813,000	155
Plainville	101,416	99,700	92,800	100,300	95,000		138,350		2,265	128,400	56
Plymouth	1,417,000	1,760,000	2,015,000	1,559,100	1,749,400	1,362,400	1,370,090	1,483,112	13,885	1,527,700	110
Provincetown	363,000	363,200	369,000	402,700	374,100	427,700	517,380	552,663	3,564	452,800	127
Randolph and Holbrook	669,700	618,000	785,900	905,900	866,000	774,200	976,614	801,715	13,151	944,000	71
Reading	672,100	614,100	629,000	670,600	634,200	709,100	734,300	787,950	13,496	888,400	65
Rockport	373,300	287,600	303,200	320,200	321,800	316,100	357,400	377,113	4,341	386,000	89
Russell	4,070	3,500	9,000	5,500	9,500	9,500	10,000	9,836	1,221	12,000	10
Rutland	221,700	222,500	222,400	226 400	241,400	246,700	245,860	283,000	1,561	293,600	188
Salem	4,461,600	4,134,900	4,192,000	4,723,800	4,746,200	4,705,000	4,908,000	5,253,060	44,129	4,949,000	112
Salisbury	306,300	246,000	274,000	288,200	276,400	319,000	359,500	420,898	2,819	413,300	146
Saugus	785,000	791,000	858,000	840,100	788,000	880,000	860,150	920,846	18,132	960,340	53
Scituate	522,000	543,000	589,400	677,100	725,200	701,700	665,626	706,042	5,467	752,900	137
Sharon	421,000	390,000	453,000	558,900	523,700	427,100	353,327	336,263	4,342	537,900	124
Shelburne	97,300	93,000	90,600	83,000	83,200	160,000	165,000	148,900	1,672	155,000	92
Shirley	90,900	82,200	96,100	92,900	93,400	93,210	91,754	93,612	2,460	101,000	41
Shrewsbury	405,700	387,500	373,800	416,500	448,000	467,500	588,900	494,000	10,664	530,990	49

Somerset	288,000	274,900	291,200	328,800	343,700	368,350	398,100	401,146	7,569	441,700	58
Southborough		142,100	155,100	164,200	163,800		176,800				
Southbridge	919,000	977,000	992,700	1,089,900	1,243,600	1,323,100	1,385,380	1,431,337	18,150	1,376,500	76
South Hadley	724,400	404,920	466,300	434,300	452,900	512,200	478,700	537,622	7,750	543,800	70
Southwick	38,300	35,200	42,200	41,300	40,700	55,500	72,400	102,700	2,130	107,700	51
Springfield	17,200,000	17,383,500	18,954,000	19,464,000	19,890,000	20,750,000	22,545,000	23,090,000	168,170	23,172,000	138
Sterling	23,300	23,400	24,700	28,900	29,000	36,000	51,000	30,371	2,044	58,900	29
Stockbridge	215,700	162,900	172,900	170,200	210,000	226,500	200,800	198,017	1,739	193,600	111
Stoughton	691,000	619,000	614,700	669,900	641,600	688,200	621,220	694,098	9,408	881,000	93
Sturbridge	95,600	138,800	103,500	186,700	118,100	126,595	162,000	133,800	2,411	151,900	63
Sudbury	21,000	22,000	29,300	29,300	28,900	32,800	36,300	38,901	2,290	51,340	22
Taunton	2,823,000	3,742,000	3,941,300	3,991,100	3,409,300	3,344,400	3,388,920	3,285,339	39,586	3,180,900	80
Tisbury	246,000	229,400	229,700	344,100	348,800	365,900	312,240	309,520	1,719	347,500	202
Townsend	155,400	126,400	128,000	149,800	149,100	158,200	153,340	162,721	2,484	197,090	79
Uxbridge	352,800	396,300	347,400	345,000	436,200	465,600	604,640	688,337	6,809	532,900	78
Wakefield	839,500	845,500	851,900	935,400	1,035,400	992,100	1,092,070	1,151,460	20,640	1,114,400	54
Walpole	1,010,000	1,077,000	1,040,400	1,319,000	1,197,700	1,343,700	1,338,270	1,400,300	9,182	1,315,300	143
Waltham	2,798,000	2,884,000	3,450,200	3,810,600	3,726,000	3,483,500	3,419,120	3,469,700	46,310	3,844,900	83
Ware	372,000	349,200	351,000	364,000	373,100	436,200	690,170	531,915	7,595	562,600	74
Wareham	568,000	604,200	608,300	588,300	586,400	591,400	695,230	648,483	8,300	800,000	96
Warren	102,000	104,300	116,300	118,900	108,400	124,500	131,780	140,736	3,498	170,610	49
Wayland	389,000	356,000	393,200	402,700	377,900	419,000		414,135	4,218	407,020	96
Webster	680,240	754,600	793,300	786,200	756,700	756,800	853,250	922,047	13,812	915,100	67
Wellesley	1,444,000	1,367,000	1,464,600	1,571,200	1,505,900	1,753,700	1,630,200	1,682,870	19,544	2,047,200	104
West Bridgewater	199,000	186,000	190,600	235,700	216,200	232,300	232,190	237,300	3,891	205,750	53
West Brookfield	99,500	95,400	82,200	121,700	134,800	98,200	143,530	136,335	1,513	182,400	120
Westfield	2,099,100	1,947,000	1,887,600	2,082,300	2,066,800	2,323,300	2,370,400	2,429,734	20,886	2,458,000	118
Westford	131,200	138,100	145,100	126,300	159,000	169,200	173,430	160,400	3,815	185,170	48
Weston	242,000	231,700	225,500	215,100	233,800	290,200	258,400	298,250	5,180	349,000	67
West Newbury	19,300	20,500	22,400	18,600	32,200	37,700	34,200	38,563	1,503	49,560	33
West Springfield	2,033,900	1,584,000	2,397,900	2,571,700	2,289,100	2,410,800	2,529,000	2,537,668	21,307	1,341,000	63
Weymouth	1,432,000	1,482,000	1,597,400	1,553,700	1,471,200	1,565,400	1,575,000	1,675,218	31,228	1,887,100	60
Whitman	328,000	329,000	351,700	369,500	389,500	399,070	402,440	429,400	8,715	447,400	51
Wilbraham	64,100	68,400	70,900	92,400	80,400	118,200	134,500	91,998	3,763	155,000	41
Williamsburg	87,700	123,000	123,100	123,200	135,300	133,000	132,000	113,360	1,943	141,000	72
Wilmington	272,800	241,700	248,000	295,800	287,000	376,900	643,900	674,360	6,299	763,443	121
Winchendon	263,200	246,000	236,400	180,300	194,000	211,850	310,000	303,020	6,461	269,000	42
Winchester	1,109,000	1,042,000	1,115,900	1,147,300	1,005,200	1,124,100	1,133,900	1,147,833	15,475	1,393,900	90
Woburn	1,757,100	1,589,600	1,820,000	1,779,800	1,773,800	1,818,000	2,020,000	2,046,544	19,994	2,197,000	109
Worcester	19,482,000	20,715,800	21,403,700	21,316,500	20,560,700	20,291,000	21,822,750	22,518,121	202,779	22,323,000	110
Wrentham	209,000	199,000	210,600	224,400	220,700	228,000	234,900	276,000	5,341	328,900	61
Yarmouth	97,000	102,000	108,700	113,900	120,600	120,300	126,270	223,489	2,601	244,100	94

Climatological Data

During the 9-year period 1941–1949, many extremes of weather were experienced in Massachusetts. During the summer and fall of the year 1941, one of the most severe droughts in the history of the State was experienced. A second severe drought also was experienced during the summer and fall of 1949. The winter seasons of the years 1942–43, 1943–44, 1944–45 and 1947–48 were much colder than normal and cold periods of comparatively long duration were experienced in December, January, and February of each season. The winter season of 1947–48 produced an unusually large amount of snow. An average of 93 inches was received in Massachusetts which was about 41 inches more than normal.

In September 1944, a severe hurricane of tropical origin passed over southeastern Massachusetts, with wind velocity as high as 85 miles an hour. During this storm considerable damage was done to shore property in southeastern Massachusetts on Cape Cod. The rainfall preceding and accompanying the hurricane was extremely heavy just to the northeast of the center of its path. More than 8 inches of precipitation was received at several stations during the 3-day period immediately preceding and during the hurricane. In July 1945, extremely heavy rains were reported in the northwestern section of Massachusetts, resulting in flash floods which caused considerable property damage.

At the end of the year 1948, a merging of two atmospheric disturbances south of New England resulted in extremely heavy rainfall in the western part of Massachusetts. During the 3-day period in which this storm occurred certain rainfall stations received more than 10 inches of rain. This heavy rainfall caused the Hoosic, Housatonic, Deerfield and Westfield Rivers to reach flood stages on December 31. In general, the flood peaks exceeded those of the flood of 1927 but were less than those of September 1938. The Housatonic River near Great Barrington, however, reached a stage which was greater than any on record since the establishment of a gaging station in 1913. The flood control reservoir on the Westfield River undoubtedly eliminated what would have been a major flood on the Westfield River.

The organization set up under the office of the Adjutant General of the Massachusetts Committee on Public Safety was called to action during the hurricane of September 1944. At the time of the New Year's Eve flood of 1948 the Massachusetts Committee on Public Safety had been dissolved and the Governor's Disaster Relief Commission took action. In this connection the Division of Sanitary Engineering supervised the rehabilitation of water supplies and sewerage works in the affected areas.

Rainfall

The average rainfall in Massachusetts has been below normal in all except three of the past nine years. The total rainfall deficiency for the past nine years has amounted to 14.51 inches.

The following table shows the normal rainfall as deduced from the records of seven long-term stations located at Amherst, Boston, Dalton, Fitchburg, Lowell, New Bedford and Northbridge; also the rainfall for the years 1941–1949, inclusive.

Monthly Rainfall in Inches for Years 1941–1949 Inclusive

Month	Normal	1941	1942	1943	1944	1945	1946	1947	1948	1949
January	3.58	3.17	3.76	3.63	1.99	3.60	3.47	3.10	4.34	4.00
February	3.31	2.25	2.84	1.59	2.48	4.24	3.50	1.86	2.42	3.31
March	3.79	2.34	7.38	3.71	4.43	2.10	1.58	3.41	3.44	1.98
April	3.59	1.21	1.38	3.65	4.17	4.03	2.49	4.69	3.42	4.18
May	3.61	2.80	2.81	5.47	1.36	5.65	5.93	4.19	6.74	3.97
June	3.53	4.11	4.04	2.52	5.67	6.49	4.05	3.54	5.17	1.00
July	3.82	4.27	5.08	4.92	2.89	4.75	3.17	4.45	3.89	2.49
August	4.06	3.69	3.03	2.38	2.42	3.16	7.26	1.61	2.19	2.83
September	3.58	0.96	3.17	1.65	6.51	2.14	3.97	3.46	1.08	4.56
October	3.45	2.23	3.74	4.88	2.30	2.82	1.37	1.75	3.25	1.94
November	3.82	2.91	5.37	4.29	5.61	6.80	1.10	5.39	5.57	2.44
December	3.56	3.73	5.88	0.98	3.23	5.74	3.80	3.35	3.29	2.40
Totals	43.70	33.67	48.48	39.67	43.06	51.52	41.69	40.80	44.80	35.10

Sudbury River

The average annual yield of the Sudbury River during the past nine years has varied from 351,000 gallons per day per square mile in 1949 to 1,100,000 gallons per day per square mile in 1945.

In the extremely dry year of 1941 the flow was below normal for every month and in 1945 was above normal in seven of the twelve months. The following table gives the record of the yield of the Sudbury River in million gallons per day per square mile for each of the past nine years and the mean for the past 75 years; the drainage area at the point of measurement is 75.2 square miles.

Yield of the Sudbury River Drainage Area in Million Gallons per Day per Square Mile

Month	1941	1942	1943	1944	1945	1946	1947	1948	1949	Mean for 75 years 1875-1949
January	.736	.443	.994	.264	.970	2.153	1.022	.343	.748	1.112
February	1.359	.741	1.458	.565	1.016	1.514	1.085	1.023	1.549	1.429
March	1.353	3.046	2.342	1.857	3.044	2.508	2.003	3.507	1.292	2.621
April	1.025	1.134	1.157	2.642	1.084	1.005	1.642	1.758	.976	1.953
May	.352	.459	1.683	.490	1.758	1.235	1.489	1.485	.604	1.078
June	.164	.110	.246	.372	1.261	0.906	0.597	1.663	—.241	.536
July	—.050	.345	—.045	—.343	.459	—.077	0.306	.628	—.315	.222
August	—.235	.099	—.165	—.519	.191	.545	—.041	—.090	—.263	.178
September	—.243	—.092	—.216	.148	.061	.233	.000	—.362	—.156	.246
October	—.210	.106	.157	—.139	.103	.239	—.082	—.072	—.104	.346
November	.015	.667	.550	.739	.978	.217	.578	.646	—.066	.735
December	.185	1.937	.119	1.566	2.237	.445	.381	.394	.247	0.963
Average for year	.364	.753	.686	.633	1.100	.909	.746	.910	0.351	.949
Average for driest 6 mos.	—.094	.173	.065	—.001	.504	.267	.189	.192	—.187	0.375

The rainfall on the Sudbury River watershed and the total yield expressed in inches in depth (inches of rainfall collected) for each of the past nine years 1941–1949, inclusive, together with the average for 75 years are given in the following table:

Rainfall in Inches, Received and Collected on the Sudbury River Drainage Area

Column (1) Rainfall — Column (2) Rainfall Collected

Month	1941		1942		1943		1944		1945	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
January	3.81	1.313	4.42	0.790	3.37	1.772	1.77	.304	3.09	1.730
February	2.14	2.190	2.96	1.194	1.49	2.350	2.60	.609	5.12	1.637
March	2.75	2.413	7.39	5.433	4.05	4.178	4.68	2.140	2.21	5.430
April	1.30	1.769	1.73	1.958	3.54	1.997	4.68	2.947	3.04	1.871
May	2.24	0.628	2.51	0.819	4.80	3.002	0.91	.565	5.07	3.135
June	4.56	0.284	3.08	0.190	2.17	0.424	5.13	.415	6.22	2.176
July	3.68	—0.089	7.90	0.616	4.71	—0.079	1.80	—.395	2.78	.819
August	2.99	—0.420	2.34	0.176	1.80	—0.295	1.65	—.598	4.23	.341
September	0.53	—0.419	1.89	—0.158	0.85	—0.374	6.33	.165	1.59	.105
October	1.73	—0.373	3.20	0.190	5.74	0.280	2.09	—.160	2.25	.183
November	2.70	0.025	5.10	1.151	3.95	0.950	6.54	.824	7.06	1.688
December	3.46	0.331	7.02	3.454	1.20	0.212	3.53	1.798	6.50	3.990
TOTALS	31.89	7.652	49.54	15.813	37.67	14.417	41.71	8.614	49.16	23.105

Month	1946		1947		1948		1949		Mean for 75 Years (1875–1949)	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
January	3.83	3.841	2.91	1.823	5.19	0.612	3.65	1.335	3.96	1.983
February	3.41	2.438	2.18	1.749	2.18	1.706	3.24	2.496	3.82	2.322
March	1.71	4.475	3.26	3.572	3.41	6.255	1.78	2.305	4.18	4.676
April	2.65	1.734	4.65	2.835	2.91	3.035	3.80	1.685	3.65	3.372
May	5.01	2.203	3.89	2.656	5.70	2.649	4.02	1.078	3.29	1.923
June	2.86	1.564	3.26	1.031	4.88	2.871	0.71	—.370	3.42	.925
July	1.81	—0.138	4.82	0.547	4.83	1.120	1.54	—.563	3.62	.397
August	8.58	.972	1.88	—0.073	1.36	—.160	4.69	—.468	3.74	.317
September	4.32	.402	3.45	—0.001	0.88	—.624	2.95	—.269	3.55	.424
October	0.45	.426	1.11	—0.146	2.86	—.129	1.57	—.185	3.37	.616
November	1.24	.374	5.44	.997	6.31	1.121	2.51	—0.113	3.87	1.268
December	4.19	.794	4.31	.680	1.78	0.702	2.24	.441	3.75	1.718
TOTALS	40.06	19.085	41.17	15.670	42.29	19.158	32.70	7.372	44.22	19.941

Nashua River

The average annual yield of the south branch of the Nashua River at the outlet of the Wachusett Reservoir in Clinton during the past nine years has varied from 549,000 gallons per day per square mile in 1941 to 1,215,000 gallons per day per square mile in 1945. The following table gives the record of the yield of the Nashua River in million gallons per day per square mile for each of the past nine years and the mean for the past 53 years; the drainage area at the point of measurement is 107.69 square miles.

Yield of the Nashua River Darinage Area in Million Gallons Per Day Per Square Mile

Month	1941	1942	1943	1944	1945	1946	1947	1948	1949	Mean for 53 years 1897-1949
January	0.789	0.814	0.988	0.386	1.112	1.949	1.107	0.571	1.482	1.209
February	1.193	0.706	1.599	0.712	1.146	1.369	1.285	0.982	1.790	1.270
March	1.138	3.546	2.675	1.699	3.214	2.684	2.090	3.402	1.459	2.556
April	1.361	1.261	1.759	2.105	1.623	1.163	1.907	1.603	1.594	2.251
May	0.697	0.919	2.267	0.886	2.180	1.713	1.592	2.314	.968	1.338
June	0.404	1.034	0.765	1.176	1.399	1.279	0.727	2.404	.344	.879
July	0.307	0.747	0.434	0.057	0.489	0.364	0.173	0.947	—.004	.476
August	0.304	0.410	—0.153	0.066	0.588	0.720	0.254	0.067	.213	.384
September	—0.012	0.322	0.107	0.312	0.128	0.455	0.282	0.156	.037	.434
October	—0.312	0.445	0.529	0.330	0.350	0.661	0.067	0.014	—.017	.451
November	0.306	0.975	1.131	0.716	.809	0.367	0.596	0.920	.271	.808
December	0.476	1.417	0.553	1.026	1.510	0.716	0.521	0.680	.366	1.095
Average for year	0.549	1.054	1.051	0.787	1.215	1.121	0.880	1.172	.701	1.095
Average for driest 6 mos.	0.165	0.646	0.47[illegible]	0.417	0.625	0.548	0.314	0.463	.140	.570

The rainfall on the Nashua River drainage area and the total yield expressed in inches in depth (inches of rainfall collected) for each of the past nine years 1941–1949, inclusive, together with the average for 53 years are shown in the following table:

Rainfall in Inches, Received and Collected on the Nashua River Drainage Area

Column (1) *Rainfall — Column* (2) *Rainfall Collected*

Month	1941 (1)	1941 (2)	1942 (1)	1942 (2)	1943 (1)	1943 (2)	1944 (1)	1944 (2)	1945 (1)	1945 (2)
January	3.65	1.408	4.46	1.451	3.78	1.762	1.62	0.689	3.84	1.984
February	2.55	1.923	2.94	1.137	1.85	2.575	2.64	1.188	4.50	1.846
March	2.63	2.029	7.91	6.325	3.59	4.771	4.65	3.031	2.47	5.734
April	0.86	2.349	1.55	2.177	3.93	3.037	4.24	3.635	4.21	2.802
May	2.24	1.243	3.84	1.639	5.70	4.044	1.25	1.581	5.39	3.889
June	2.97	0.698	5.55	1.785	1.96	1.320	7.46	2.029	6.17	2.414
July	3.71	0.547	5.80	1.333	4.31	0.774	1.13	0.101	5.12	0.872
August	3.02	0.542	2.20	0.730	2.23	—0.273	0.95	0.117	3.72	1.049
September	0.71	—0.021	2.52	0.556	1.44	0.185	6.79	0.538	2.33	0.221
October	2.44	—0.556	3.39	0.793	5.67	0.944	2.17	0.588	2.15	0.624
November	3.09	0.527	5.41	1.683	5.26	1.954	4.64	1.235	5.49	1.396
December	3.55	0.850	6.00	2.528	0.77	0.986	4.07	1.831	6.22	2.694
TOTALS	31.42	11.539	51.57	22.137	40.49	22.079	41.61	16.563	51.61	25.525

Month	1946 (1)	1946 (2)	1947 (1)	1947 (2)	1948 (1)	1948 (2)	1949 (1)	1949 (2)	Mean for 53 Years 1897–1949 (1)	Mean for 53 Years 1897–1949 (2)
January	3.86	3.477	3.38	1.975	4.25	1.018	4.40	2.643	3.84	2.156
February	4.26	2.205	2.72	2.070	2.98	1.639	3.42	2.884	3.64	2.063
March	1.76	4.788	3.77	3.729	3.87	6.069	1.89	2.602	4.06	4.559
April	2.77	2.008	5.31	3.292	3.05	2.767	4.55	2.752	3.87	3.885
May	6.33	3.055	3.64	2.840	7.39	4.128	3.75	1.726	3.53	2.387
June	3.23	2.208	3.20	1.254	6.06	4.150	.60	.594	3.93	1.517
July	4.36	0.649	4.18	0.308	5.84	1.689	2.21	—.007	3.96	.850
August	6.54	1.284	1.91	0.453	1.89	0.119	3.42	.380	3.77	.686
September	5.52	0.785	3.68	0.487	0.81	0.269	2.53	.064	3.88	.749
October	1.03	1.179	1.22	0.121	3.11	0.025	2.22	—.031	3.13	.805
November	1.47	0.633	5.91	1.029	7.15	1.588	2.54	.467	3.88	1.395
December	4.12	1.278	3.60	0.929	2.86	1.212	3.38	.652	3.87	1.952
TOTALS	45.25	23.549	42.52	18.487	49.26	24.673	34.91	14.726	45.36	23.004

Merrimack River

The Merrimack River, which is the second largest stream in Massachusetts, has a total drainage above its mouth at Newburyport of 5000 square miles, of which 1250 square miles are within the limits of Massachusetts. The records of flow of the Merrimack River have been kept continuously in the office of the Essex Company since 1880. The net watershed above the point of measurement is considered to be 4,463 square miles.

The following table gives the records of the flow of the Merrimack River at Lawrence for each of the past nine years and the mean for the past 70 years — the amounts being expressed in cubic feet per second per square mile of drainage area:

Flow of the Merrimack River at Lawrence in Cubic Feet Per Second Per Square Mile

Month	1941	1942	1943	1944	1945	1946	1947	1948	1949	Mean for 70 Years 1880-1949
January	1.571	.911	1.364	.757	1.573	2.138	1.060	.682	2.262	1.333
February	1.874	.733	1.472	.876	1.254	1.784	2.014	.983	1.829	1.372
March	1.441	3.189	2.754	1.808	4.5 5	4.296	2.834	3.732	2.339	2.804
April	2.356	3.297	2.959	4.120	3.248	2.289	3.749	3.113	2.648	3.619
May	.952	1.607	3.804	2.341	4.105	2.659	3.085	3.211	1.742	2.324
June	.539	1.610	1.467	2.147	2.583	1.934	2.361	2.404	.693	1.341
July	.536	.877	.630	1.085	1.380	.571	.959	1.065	.329	.782
August	.294	.665	1.038	.429	.726	.893	.550	.511	.272	.644
September	.267	.452	.561	.843	.566	.624	.496	.297	.394	.676
October	.326	.513	.764	.736	.876	1.112	.259	.290	.352	.775
November	.529	1.210	2.151	.762	1.309	.841	.955	.924	.618	1.147
December	.594	1.725	1.201	1.386	2.400	.827	.810	.634	.797	1.165
Average for year	.940	1.399	1.680	1.441	2.044	1.664	1.594	1.487	1.190	1.498
Average for 6 driest mos.	.415	.888	1.058	.873	1.210	.811	.672	.620	.443	.865

Examination of Rivers

Under the provisions of the General Laws, the Department maintains general oversight over the surface waters of the state. Massachusetts is especially fortunate in that sources of water supply are obtained from unpolluted sources with the exception of that of the city of Lawrence which uses the Merrimack River as its source of supply. The river systems of the State are such that it is possible to obtain water supplies in the upland regions of these streams and to discharge waste materials below the cities and towns without endangering other sources of water supply.

Many of the larger cities of the Commonwealth are located along the coast, or on large streams, and it was originally possible to dispose of sewage without treatment by means of sea outfalls or direct river discharge without creating a nuisance in many instances. However, with the growth of cities and towns and certain industries it has been necessary to provide sewage treatment to maintain satisfactory conditions in our rivers. The natural recuperative powers of Massachusetts streams are very great, and thus the streams do quickly recover, even after serious pollutional loads are added.

Most of the small streams of the Commonwealth are not polluted, but the main threads of the streams receive sewage and industrial waste either directly or after treatment. Certain streams, such as the Nashua River below Fitchburg, the Rumford River in Mansfield and Norton, the French River at Webster, the Quinebaug River below Southbridge, the Housatonic River below Dalton and in Lee, portions of the Hoosic River, and the Merrimack River below Haverhill, have on several occasions been found to be devoid of dissolved oxygen and nuisance conditions have prevailed. Much of the Division's efforts have been directed to eliminating sources of pollution which have caused these nuisance conditions. Special legislation was enacted in 1949 providing for an investigation of the sanitary condition of the Housatonic River. Legislation was also requested for an investigation of the Sudbury River by a Joint Board to consist of the State Planning Board, the Department of Agriculture, the Department of Conservation, and the Department of

Public Health. It will be necessary to request similar legislation for the investigation of the sanitary condition of other rivers as the funds and permanent staff available to the Department are not adequate to do this work.

River Sampling

River sampling stations have been maintained by the Department for a great number of years. The schedule was revised and enlarged prior to the 1949 season to include all of the interstate rivers in order to have information available on which to base the future classifications of streams in connection with the work of the New England Interstate Water Pollution Control Commission. During the year 1949 the Department maintained 255 river sampling stations on the various rivers of the Commonwealth. Samples were collected from June through November at most of these stations for dissolved oxygen content and chemical analysis. In addition, samples were collected on several occasions for bacterial examination. The number of sampling stations on each river were as follows:

Aberjona (12), Ipswich (7), Merrimack (19), North (Salem-5), Shawsheen (2), Assabet and Sudbury (17), Charles (18), Neponset (16), Taunton (17), Ten Mile (4), Rumford (17), Blackstone (16), Nashua (15), Otter (2), Quinebaug & French (14), Ware & Quaboag (13), Connecticut & Chicopee (14), Green (2), Millers (5), Mill, Manhan, Deerfield (8), North (Colrain-2), Scantic (1), Westfield (5), Farmington (2), Hoosick (8), Housatonic (14).

New England Interstate Water Pollution Control Commission

Under date of November 20, 1940, Mr. Victor M. Cutter, Chairman of the National Resources Planning Board, Region One, appointed a committee "to set up criteria for classification of pollution in New England streams and to investigate the possibilities of actually making such a classification." This committee consisted of the following members:

Lt. Col. J. S. Bragdon, District Engineer, U. S. Engineer Office, Providence, Rhode Island.

E. W. Campbell, Director, Division of Sanitary Engineering, Maine Department of Health, Augusta, Maine

Edward L. Bike, State Supervisor, Recreation Study, U. S. National Park Service

W. C. Herrington, U. S. Fish and Wildlife Service, Department of the Interior

C. D. Howard, Chief, Division of Chemistry and Sanitation, New Hampshire State Board of Health, Concord, New Hampshire

Eskil C. Johnson, Sanitary Engineer, Sewage & Shellfish Section, Rhode Island, State Department of Health, Providence, Rhode Island

Dr. C. C. Pierce, U. S. Public Health Service, Wall, Nassau & Pine Streets, New York City.

Philip Shutler, Director, Vermont State Planning Board

Edward L. Tracy, Sanitary Engineer, Vermont State Board of Health, Burlington, Vermont

Herbert E. Warfel, Biologist, New Hampshire Fish and Game Commission, Concord, New Hampshire

Arthur D. Weston, Chief Sanitary Engineer, Massachusetts Department of Public Health, Boston, Massachusetts

Warren J. Scott, Director, Bureau of Sanitary Engineering, State Department of Health, Hartford, Connecticut, Chairman

The committee arranged for Gordon M. Fair, Professor of Sanitary Engineering, Harvard University, to act as consultant for the committee. This committee which became known as the Special Committee of Classification of New England Waters, made its report to the National Resources Planning Board, setting forth a system of classification of waters according to highest use.

Class A—Waters as source of drinking water or for the cultivation of market shellfish.

Class B—Waters used for bathing

Class C—Waters used for recreational boating, fishing, cultivation of seed oysters, or industrial supply with treatment

Class D—Waters used primarily for transporting of waste without uses.

Standards were set for each of these classifications to cover the physical appearance, dissolved oxygen content, and bacterial quality.

In order to promote cooperative programs for cleaning up interstate streams the Special Committee recommended, in part, that the National Resources Planning Board request the governor of each New England state to appoint a State committee for classification of the State's waters in accordance with the classifications prepared in its report, such committees to include official representatives of the State agencies supervising (1) health, (2) water pollution or water conservation, (3) fish and game, and (4) planning; together with a representative of industry. Under date of February 5, 1941, Victor M. Cutter, Chairman of the National Resources Planning Board, made such request to the Honorable Leverett Saltonstall, Governor of Massachusetts. The Governor appointed to such a committee Raymond J. Kenney, Commissioner of Conservation, Otis D. Fellows, Chief Engineer of the State Planning Board, and Richard K. Hale, Director of the Division of Waterways, Department of Public Works, with Arthur D. Weston, Chief Sanitary Engineer, Department of Public Health, as Chairman. Massachusetts was the first State to appoint such a committee. Similar committees were appointed by the governors of each New England State with the exception of one. Subsequently, the chief engineers of the various regulatory agencies of the New England States met frequently and prepared tentative classifications of the various interstate streams in accordance with the standards prepared by the Special Committee of the National Resources Planning Board.

This informal cooperation between the states in the matter of stream pollution control ultimately led to a recommendation that a compact be established to set up a permanent organization to coordinate the work of the various New England states in this matter.

Under the provisions of Chapter 421 of the Acts of 1947 the State Planning Board was authorized to enter into a compact with the other New England States to establish a New England Interstate Water Pollution Control Commission. The Preamble of this Compact reads as follows:

"Whereas, The growth of population and the development of the territory of the New England States has resulted in serious pollution of certain interstate streams, ponds and lakes, and of tidal waters ebbing and flowing past the boundaries of two or more states; and

Whereas, Such pollution constitutes a menace to the health, welfare and economic prosperity of the people living in such area; and

Whereas, The abatement of existing pollution and the control of future pollution in the interstate waters of New England area are of prime importance to the people and can best be accomplished through the co-operation of the New England States in the establishment of an interstate agency to work with the States in the field of pollution abatement:

Now, therefore, the states of Connecticut, Maine, Massachusetts, New-Hampshire, Rhode Island and Vermont do agree and are bound as follows:"

The Compact recognizes such variable factors as location, size, character, and flow, and the many varied uses of the waters of New England, and that no single standard of sewage and waste treatment was practicable. The Commission was directed to establish reasonable physical, chemical, and bacterial standards of water quality satisfactory for various classifications of use, and each signatory State agreed to prepare a classification of its interstate waters according to the present and proposed highest use of these waters. The signatory States pledged to provide for the abatement of existing pollution and for the control of future pollution of interstate, inland, and tidal waters of New England, and to protect and maintain the waters in a satisfactory condition consistent with the highest classified use of each body of water.

Rhode Island was the first State to ratify this compact. To date, Rhode Island, Connecticut, Massachusetts and New York, insofar as it lies within the New England Drainage Basin Watershed, have ratified the Compact. The Compact, after ratification by the States, was submitted to the Congress of the United States and was approved by that body.

The Governor of Massachusetts appointed the following to the Commission:

Dr. Vlado A. Getting,
Commissioner of Public Health
Lewis R. Hovey
Leo Marceau
Lawrence F. Miller and
Robert H. Russell

The Compact Commission has held five meetings, Dr. Vlado A. Getting, Commissioner of Public Health, was elected Chairman, Walter J. Shea, Temporary Secretary, and Leo Marceau, Treasurer. The first meeting was held in Boston on November 25, 1947. The Commission established a Technical Advisory Board consisting of the chief engineers of the various regulatory agencies of each State. Other New England States have been invited to be represented at each meeting of the Commission and at each meeting of the Technical Advisory Board, in order that all of the New England States might be acquainted with the work of the Commission and advise the Commission relative to matters pertaining to the States which they represent.

Tentative standards for water classification were adopted February 11, 1949. The State of Vermont has passed enabling legislation to join the Commission but formal execution of the Compact has been delayed pending the need of further classification. The Department is continuing to cooperate with the other New England States and the Commission to establish effective controls of the pollution of the various streams. Plans are now under way for the establishment of a permanent office in Boston and the appointment of a permanent engineering secretary to represent the Commission.

Cooperation with U. S. Public Health Service

Beginning with the Fifty-fifth Congress in 1897, there have been federal water pollution control measures before all but six Congresses. Separate bills were passed by the House and Senate in 1936 and in 1940, but agreement was not reached on any single bill. The Eightieth Congress, Second Session, enacted Public Law 845 and set the policy of Congress in matters of water pollution control. This policy is to:

(a) recognize, preserve, and protect the primary responsibilities and rights of the States in controlling water pollution.
(b) support and aid technical research to devise and perfect methods of treatment of industrial wastes not susceptible to known effective methods of treatment.
(c) provide Federal technical services to State and interstate agencies and to industries.
(d) provide financial aid to State and interstate agencies and to municipalities.
(e) place the responsibilities of the program with the Surgeon General of the U. S. Public Health Service and the Federal Works Administrator.

Under the provisions of this Act, the U. S. Public Health Service has divided the country into 14 regional river basin districts. The New England district, with headquarters in Boston, embraces all of New England and that portion of New York which is included in the New England Interstate Water Pollution Control Compact.

No Federal funds were made available for grants for planning or as aids to States or interstate agencies for investigation during the fiscal year 1949. However, it is anticipated that certain limited funds will be made available to the various State and interstate regulatory agencies for investigations or studies of industrial wastes relative to the control of pollution from industrial sources.

Rules and Regulations for Prevention of Stream Pollution

During the period covered by this report, Chapter 388 of the Acts of 1941 was adopted giving this Department limited authority on new sources of pollution but it gave the Department no authority to control on sewer systems existing on Jan-

uary 1, 1941, nor on industrial wastes from plants existing on that date. During the war it seemed impracticable to obtain more satisfactory legislation, but in 1945 the condition of various rivers became so objectionable, particularly the North River in Salem and Peabody and the Taunton River in Taunton and Berkley, that the matter was again agitated. The Legislative Committee on Public Health made various inspections and held hearings in Taunton, Salem and Lee.

The first comprehensive stream pollution control law for the Commonwealth was enacted by the Legislature with an emergency preamble in 1945 and is known as Chapter 615 of the Acts of that year. The act provides that the Department of Public Health shall prescribe and establish rules and regulations to prevent pollution or contamination of any or all of the lakes, ponds, streams tidal waters, and flats within the Commonwealth. Such rules and regulations were prescribed and established by the Department of Public Health at the meeting of its Public Health Council on Tuesday, August 14, 1945, and were approved by the Governor and Council on September 19, 1945. In general these rules and regulations provide that no sewage, human excrement, house slops or sink wastes, garbage, manure or putrescible matter, manufacturing refuse, waste product or any polluting liquid poisonous or injurious to humans or animals, shall be discharged into any waterway within the Commonwealth except as it may be approved by the Department of Public Health when in its opinion the best practicable and reasonably available means to render the same harmless have been provided in accordance with plans approved by the Department.

This legislation has been of material assistance to the Department in preventing the continued pollution of various lakes, ponds, streams and tidal waters and flats. Under the provisions of the law it is necessary to publish these rules and regulations in a newspaper of the town where such rule or regulation is to take effect, or, if no newspaper is published in such town, to post a copy of such rules and regulations in a public place in the town. The towns in which these Rules and Regulations have been published up to June 30, 1949, are as follows:

	City or Town	*Date*
1.	Taunton	Nov. 14, 1945
2.	Worcester	Nov. 14, 1945
3.	Auburn	Nov. 14, 1945
4.	Salem	Nov. 16, 1945
5.	Peabody	Nov. 16, 1945
6.	Woburn	Mar. 22, 1946
7.	Fitchburg	Apr. 25, 1946
8.	Attleboro	July 25, 1946
9.	Foxborough	June 28, 1946
10.	Mansfield	June 28, 1946
11.	Framingham	July 22, 1946
12.	Provincetown	Jan. 6, 1947
13.	Middleborough	Jan. 15, 1947
14.	Falmouth	Feb. 19, 1947
15.	Sunderland	Jan. 2, 1947
16.	Bridgewater	Jan. 22, 1947
17.	Swansea	Apr. 23, 1947
18.	Norton	Apr. 25, 1947
19.	Weymouth	May 27, 1947
20.	Dudley	June 11, 1947
21.	Webster	July 29, 1947
22.	Ayer	Aug. 27, 1947
23.	Nahant	Mar. 16, 1948
24.	North Adams	June 9, 1948
25.	North Brookfield	July 28, 1948
26.	North Attleborough	Oct. 21, 1948
27.	Edgartown	May 13, 1949
28.	Gay Head	May 12, 1949
29.	West Tisbury	May 12, 1949

City or Town	Date
30. Chilmark	May 12, 1949
31. Oak Bluffs	May 12, 1949
32. Tisbury	May 13, 1949
33. Scituate	June 13, 1949

It has been necessary to use this legislation in court only in connection with the construction of sewage treatment works at Taunton and the improvement of one of the main sewers of the city of Woburn and in connection with three sources of industrial wastes in Taunton. Court cases have been prepared against North Brookfield and Peabody but litigation was not necessary. The act has been referred to by the Department in numerous letters where certain municipalities and industries continue to violate the rules and regulations prescribed by the Department under the provisions of Chapter 615 of the Acts of 1945. Cases are now pending against the towns of Rockland and Nahant and certain individuals in Provincetown.

Only one of the cases brought by the Department under the provisions of Chapter 615 of the Acts of 1945 entailed any very extensive litigation, viz., Attorney General *v.* City of Woburn. This case was tried during a period covering several days before Judge Hanify of the Superior Court, and it was ordered, adjudged and decreed:

> "That the city of Woburn, a municipal corporation, its officers, servants, agents and employees be, and they hereby are, enjoined from discharging any sewage or waste containing any putrescible organic matter or other deleterious substances into the Aberjona River or any tributary thereof."

This decree was entered on April 8, 1947, and the city of Woburn appealed to the Supreme Court. The case was brought not only under Chapter 615 of the Acts of 1945, an amendment of Section 5 of the General Laws, Chapter 111, but also under the provisions of the special act relating to the Aberjona River, Chapter 291 of the Acts of 1911. The Supreme Judicial Court in 322 Mass. 634 stated that the decree of the Superior Court was amply supported by the evidence and the decree was affirmed with costs.

Municipal Sewage Treatment Works

The Division of Sanitary Engineering, as required by Chapter 111 of the General Laws, has from time to time examined the various municipal sewage treatment works in this Commonwealth and the main outlets of municipal sewers and has investigated the effect of the sewage disposal. Examinations have also been made of the sewage treatment works of the state, county and other institutions and industrial plants. Regular periodic samples have been collected of the sewage and effluent of the municipal sewage treatment works.

Of the 351 cities and towns in this Commonwealth, 135 municipalities are now served by public sewerage systems. While no accurate figure is available at this time as to the population actually served by these sewers, the total population of the above municipalities, according to the 1945 census, is 3,997,638. Sewage from 90 of the above 135 municipalities is disposed of by discharge into inland or tidal waters. Sewage from the remaining 45 municipalities representing a total population of 902,873 persons is discharged to sewage treatment works. 216 Massachusetts municipalities have no recognized public sewerage systems; these towns represent a total of 495,643 persons or 11% of the total Massachusetts population of 4,493,281.

New Municipal Sewerage Systems

During this period public sewers have been introduced in four municipalities, namely, Ayer, East Longmeadow, Ludlow, and Weymouth. Of these four, the first three towns also have treatment works; sewage from Weymouth is discharged tothe mains of the South Metropolitan Sewerage System.

New Municipal Sewage Treatment Works

City or Town	*Year*	*Treatment*	*Sewage or Effluent Discharged Into*
Ayer	1943	Comminutor, Imhoff tank, trickling filter, secondary sedimentation, sludge beds.	Nonacoicus Brook
East Longmeadow	1941	Bar rack, grit chamber, Imhoff tank, high rate trickling filter, secondary sedimentation, chlorination, glass covered sludge bed.	Pecoosic Brook
Ludlow	1941	Bar rack, comminutor, grit chamber, aeration, mechanically equipped settling tank, sludge digestion, glass covered sludge beds.	Chicopee River

Major Additions to Sewage Treatment Works

City or Town	*Year*	*Improvement*
Brockton	1941	Primary settling, sand filters.
Framingham	1946	Chlorination.
Franklin	1948	Settling tanks, trickling filters rotary distributors.
Gardner	1949	Primary sedimentation, trickling filter, secondary sedimentation, sludge digestion. (Replacing two old plants).
Hopedale	1949	Imhoff tank, trickling filter, secondary sedimentation.
Marlborough	1948	Grit chambers, comminutors, Imhoff tanks, high rate trickling filters, final settling tanks.
Natick	1946	Chlorination.
North Attleborough	1948	High rate trickling filters, mechanically equipped tanks, sludge digestion, open sludge beds.
North Brookfield	1949	Chlorination, sand filters.
Worcester	1948	Trickling filters rotary distributors.

Acquisition of Land for Sewage Treatment Works

Under the provisions of General Laws, Chapter 83, Section 6, the Department is required to hold a public hearing when a town proposes to purchase land or take the same by eminent domain for the treatment, purification and disposal of sewage. During this period hearings have been held relative to the taking of land by nine municipalities. In the instance of Ayer, land was acquired under the provisions of Chapter 255 of the Acts of 1941, and by Bridgewater, under the provisions of Chapter 472 of the Acts of 1948.

The takings are shown on the following table:

Municipality	*Areas of Land in Proposed Taking (Acres)*
Ayer	–
Bridgewater	6.0
Fall River	16.9
Grafton	10.0
Ipswich	3.0
Middleborough	4.0
North Brookfield	2.1
Taunton	58.0
Westfield	6.0

Analytical Results and Record of Operation

Due to the large volume of work assigned to the Division of Sanitary Engineering, it has become necessary to request the operators of the various sewage treatment works in the Commonwealth to collect samples for chemical analysis at their plants and to submit the same to the Department for analysis. Sample bottles for this purpose are sent to the various operators four times each year. The tables below contain data relative to the analyses for the samples collected during the year 1949. Only a limited amount of data is presented; however, detailed analyses are available in the office of the Division of Sanitary Engineering to any who are interested in such information.

TABLE I — *Sewage Treatment Plant Data*

1949

CITY OR TOWN	Year of Construction of and Additions to	Population 1945	Approx. No. of House Connections	Av. Daily Sewage Flow M.G.D.	Type of Treatment	Effluent Discharged to
Amherst	1940	7,089	1,172	.699	Primary settling	Connecticut River
ATTLEBORO	1912	22,375	2,368	1.348	Primary settling—Sand filters	Ten Mile River
Ayer	1943	3,967	465	.271	Imhoff tank—Trickling filter—Secondary settling	Nashua River
Barnstable	1936	8,647	239	2.69	Imhoff tanks—Sand filters	None
Belchertown	1942	3,769	105	0.129*	Primary settling—Sand filters	Batchelor Creek
Billerica	1902	8,504	–	–	Sand filters	Concord River
BROCKTON	1893–1905–1908–1912	65,202	9,516	3.441	Primary settling—Trickling filters—Secondary settling	Coweeset River
BROCKTON	1941	–	–	–	Primary settling—Sand filters	Coweeset River
Clinton	1898	12,736	2,034	1.491	Primary settling—Sand filters	Nashua River
Concord	1899–1928–1934	8,382	944	.430	Sand filters	Concord River
East Longmeadow	1941	3,805	–	–	Imhoff tank—Trickling filter—Secondary settling	Pecoosic Brook
Easthampton	1908	10,578	–	–	Primary settling—Sand filters	Manhan River
Fitchburg	1914	43,770	–	3,524	Imhoff tank—Trickling filter—Secondary settling	Nashua River
Foxborough	1885	6,457	–	–	Sand filters	Rumford River
Framingham	1890–1924–1933	25,502	4,837	1.830	Imhoff tank—Trickling filter-Secondary settling	Bannister Brook
Framingham	1938	–	–	–	Imhoff tank—Sand filters	Bannister Brook
Franklin	1915–1948	7,531	1,024	.345	Primary settling—Trickling filter—Secondary settling	Mine Brook
GARDNER	1901–1909–1931–1949	20,245	3,028	–	Primary settling—Trickling filter—Secondary settling	Otter River
Greenfield	1940	17,020	3,130	1.049	Primary settling	Green River
Hopedale	1900–1923–1949	3,317	–	–	Imhoff tank—Trickling filter—Secondary settling	Mill River
Hudson	1904–1910	8,126	1,283	0.726	Primary settling—Sand filters	Assabet River
Leicester	1894–1928–1939	5,154	–	–	Primary settling—Sand filters	Town Meadow Brook
Lenox	1888–1933	2,951	421	–	Primary settling—Sand filters	Housatonic River
Leominster	1937	23,549	4,000	2.195	Primary settling—Activated sludge—Secondary settling	Nashua River
Ludlow	1941	8,065	737	–	Primary settling	Chicopee River
Mansfield	1940	6,978	–	–	Imhoff tank—Trickling filter—Secondary settling	Rumford River
Marion	1906–1930	2,120	300	0.203	Primary settling—Sand filters	Buzzard's Bay
MARLBOROUGH	1891–1908–1948	15,680	–	0.934	Imhoff tank—Trickling filter—Secondary settling—Sand filters	Hop Brook
Maynard	1929	7,017	1,078	0.364	Imhoff tank—Trickling filter—Secondary settling	Assabet River
Medfield	1907	4,199	–	–	Sand filters	Charles River
Milford	1907–1924–1936	15,801	2,144	.795	Imhoff tanks—Trickling filters—Secondary settling	Charles River
Millis	1919	2,329	–	–	Primary settling—Sand filters	Charles River

Nantucket (2)	1930	2,870	–	–	Sand filters	Atlantic Ocean
Natick	1896–1935	15,789	2,056	0.918	Imhoff tank—Trickling filter—Secondary settling	Bannister Brook
North Adams	1935	22,230	3,336	1.619	Primary settling	Hoosick River
North Attleborough	1909–1931–1948	11,552	–	–	Primary settling—Trickling filter—Secondary settling—Sand filters	Ten Mile River
Northbridge	1906–1920	10,212	1,214	.893	Primary settling—Sand filters	Blackstone River
Pittsfield	1901–1915–1937				Primary settling—Trickling filter—Secondary settling	Housatonic River
Pittsfield	–	53,560	8,865	5.770	Primary settling—Sand filters	Housatonic River
Southbridge	1908–1925	17,561	–	1.553	Primary settling—Sand filters	Quinebaug River
Spencer	1897–1923–1935	6,765	–	–	Sand filters	Seven Mile River
Springfield (Main Plant)	1940	159,896		19.558	Primary settling	Connecticut River
Springfield, Indian Orchard	1940	–	22,437	1.112	Primary settling	Chicopee River
Stockbridge	1899–1921	1,739	252	–	Sand filters	Housatonic River
Westborough	1892–1911	6,665	–	0.358	Sand filters	Assabet River
Winchendon	1928	6,461	–	0.221	Primary settling—Sand filters	Millers River
Worcester	1898–1925–1948	198,741	33,936	21.712	Imhoff tanks—Trickling filters—Secondary settling	Blackstone River

*Includes sewage of Belchertown State School.

TABLE II — *Sewage Analyses*
1949
(Parts per Million)

City or Town	Raw Sewage			Effluent Primary Treatment			Effluent—Trickling Filters or Activated Sludge			Effluent Secondary Settling			Effluent Sand Filters			Overall Reduction Per cent	
	Susp. Solids			Susp. Solids			Susp. Solids			Susp. Solids			Susp. Solids				
	Total	Loss on Ignition	B. O. D.	Total	Loss on Ignition	B. O. D.	Total	Loss on Ignition	B. O. D.	Total	Loss on Ignition	B. O. D.	Total	Loss on Ignition	B. O. D.	S. S.	B. O. D.
Amherst	169	129	200	71	58	173	–	–	–	–	–	–	–	–	–	58	14
Attleboro	51	43	76	–	–	–	–	–	–	–	–	–	23	11	15	55	80
Ayer	142	126	260	70	66	156	17	15	11	50	38	38	–	–	–	65	85
Barnstable	189	156	350	58	54	178	–	–	–	–	–	–	–	–	–	–	–
Belchertown	524	463	715	59	55	190	–	–	–	–	–	–	6	4	13	99	98
Billerica	159	142	387	–	–	–	–	–	–	–	–	–	14	10	40	91	90
Brockton	252	220	242	139	122	260	93	82	47	63	54	37	–	–	–	75	85
Brockton							–	–	–	–	–	–	34	22	42	87	83
Clinton	152	117	221	41	35	114	–	–	–	–	–	–	7	5	2	94	99
Concord	164	139	252	–	–	–	–	–	–	–	–	–	17	9	1	90	99+
East Longmeadow	61	50	83	22	19	35	45	32	29	26	22	26	–	–	–	57	69
Easthampton	147	125	177	123	88	148	–	–	–	–	–	–	10	4	4	93	97
Fitchburg	205	162	217	74	58	159	43	33	11	45	35	12	–	–	–	78	94
Foxborough	91	78	212	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Framingham	253	196	213	94	75	180	112	78	49	70	51	44	–	–	–	72	79
Framingham				–	–	–	–	–	–	–	–	–	68	33	43	73	80
Franklin	212	177	294	83	73	121	98	88	50	40	37	52	–	–	–	81	82
Gardner	367	313	443	81	66	147	68	55	88	34	25	61	–	–	–	91	86
Greenfield	215	158	211	68	55	88	–	–	–	–	–	–	–	–	–	68	58
Hopedale	171	119	285	75	64	115	58	51	50	31	30	23	–	–	–	82	92
Hudson	256	211	330	78	70	196	–	–	–	–	–	–	53	35	49	79	85
Leicester	169	126	95	–	–	–	–	–	–	–	–	–	14	12	10	92	89
Lenox	130	110	165	108	84	143	–	–	–	–	–	–	17	16	20	87	88
Leominster	200	164	176	59	51	118	–	–	–	10	9	9	–	–	–	95	95
Ludlow	127	108	297	60	53	168	–	–	–	–	–	–	–	–	–	53	43

Mansfield	417	206	364	101	79	376	36	30	49	50	43	68	–	–	–	88	81
Marion	439	362	296	40	33	92	–	–	–	–	–	–	9	6	5	98	98
Marlborough	289	240	440	51	47	130	59	51	81	30	27	58	9	7	4	97	99
Maynard	197	171	322	124	110	299	82	69	81	65	52	42	–	–	–	67	87
Medfield	243	197	465	–	–	–	–	–	–	–	–	–	9	8	25	96	95
Milford	1221	984	723	44	41	143	41	31	20	44	34	18	–	–	–	97	98
Millis	7	5	21	–	–	–	–	–	–	–	–	–	3	2	1	57	95
Nantucket (2)	100	89	102	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Natick	162	139	183	63	51	165	48	37	19	44	32	17	–	–	–	73	91
North Adams	189	162	389	94	82	245	–	–	–	–	–	–	–	–	–	50	37
North Attleborough	83	70	143	47	41	92	32	28	35	–	–	–	19	16	25	77	82
Northbridge	182	147	232	62	51	118	–	–	–	–	–	–	31	26	29	83	87
Pittsfield }							27	24	13	59	56	9	–	–	–	70	96
Pittsfield }	196	158	201	47	40	99	–	–	–	–	–	–	5	4	2	97	99
	160	135	173	83	76	145	–	–	–	–	–	–	10	8	56	94	68
Southbridge																	
Spencer	172	149	257	–	–	–	–	–	–	–	–	–	29	11	10	83	96
Springfield	119	88	126	59	46	103	–	–	–	–	–	–	–	–	–	50	18
Springfield, Indian Orchard	261	122	151	89	58	114	–	–	–	–	–	–	–	–	–	66	25
Stockbridge	46	42	68	–	–	–	–	–	–	–	–	–	4	4	1	91	99
Westborough	214	179	393	–	–	–	–	–	–	–	–	–	11	9	8	95	98
Winchendon	855	667	802	44	35	104	–	–	–	–	–	–	18	11	6	98	99
Worcester	330	181	194	107	72	133	113	75	47	57	38	29	–	–	–	83	85

Examination of Sewer Outlets Discharging Into the Sea

Since the war the Department has attempted to make annual examinations of all of the main sewer outlets including those discharged into the sea as required by law. The most important outlets discharging into the sea are those of the Metropolitan Sewerage Districts at Nut Island in the southerly part of the harbor and Deer Island in the northerly part of the harbor. Sewage treatment works for the treatment of the sewage of the South Metropolitan Sewerage District at Nut Island are now being completed by the Metropolitan District Commission at a cost of some $6,750,000, and it is hoped that when these works are put into operation it may be practicable for the Department to approve certain additional areas for bathing and to remove the restrictions on the taking of shellfish from certain areas in the southerly part of the harbor. Works are now being designed for the treatment of the sewage collected in the North Metropolitan Sewerage System. Funds for conveying the sewage to the sewage treatment works are available, and it is expected that the preliminary plans for the treatment works will shortly be completed. The treatment works at Nut Island and Deer Island will consist primarily of sedimentation and chlorination with the digested sludge being discharged on the ebb tide in deep water in or near President Roads. The city of Boston has prepared complete contract drawings for treatment works at the Calf Pasture. These plans have been approved by the Department, and under the provisions of Chapter 598 of the Acts of 1949 the city is required to construct these and appurtenant works before July 1, 1955. The city is authorized to borrow funds outside the debt limit not exceeding $12,000,000.

In regard to the smaller sewer outfalls into the sea the town of Rockport has constructed an outfall through which a considerable quantity of its sewage is being discharged into tide water having a depth of 34 feet at low tide. The outfall sewer of the South Essex Sewerage District has been cleaned on one or more occasions in the period covered by this report and, in addition, a substantial grit and grease chamber has been constructed for the removal of grit and grease from the sewage of the city of Peabody. A new outfall sewer has been constructed for the removal of the sewage of the town of Swampscott to take the place of the existing outfall constructed nearly 50 years ago which was found to be in an unsatisfactory condition. Late in the period covered by this report the town of Plymouth authorized an engineering study to be made for the discharge of sewage after primary treatment into Plymouth Harbor or into the sea through an outfall off Rocky Point. The town of Provincetown has given consideration to an outfall into tide water but as the cost was very considerable the town has elected to postpone any sewage treatment works other than to provide for the construction of a large number of local cesspools. The town of Falmouth has completed the first step of the outfall sewer at Woods Hole. The town of Fairhaven has completed its studies for sewage disposal and rather than to discharge the sewage after treatment into valuable shellfish areas has decided to treat the sewage at an isolated point and discharge it after sedimentation and chlorination into the Acushnet River. At New Bedford the city is completing new intercepting sewers along the waterfront with a view to preventing the continued discharge of sewage into the Acushnet River. The city of Fall River is completing its sewage treatment works providing for sedimentation, chlorination and the discharge of the effluent through a submerged outlet into Mount Hope Bay. It is hoped that during the coming year the city will finance the construction of an intercepting sewer to remove all of the sewage now being discharged into the Taunton River and Mount Hope Bay to the sewage treatment works.

Shellfish

The period covered by this report has seen considerable activity in connection with the sanitary control of shellfish. No extensive changes have been made in the shellfish from contaminated areas. It has been necessary since the adoption of Chapter 463 of the Acts of 1948 to examine annually all of the contaminated areas. This has been an arduous task for the Division of Sanitary Engineering as it is felt that as the approval or disapproval of shellfish harvesting areas is based largely on sanitary surveys with limited reliance on the analyses of overlying waters and the shellfish. Furthermore the annual advertising and posting is a problem which if continued must result in the request for a very substantial addition to the funds available for shellfish control. Three reports (H. 1475–1946, H. 1850–1947, H.

1770–1948 and H. 2275–1949) have been prepared with the assistance of the Department relative to general questions on the sanitary control of shellfish with particular reference to a development of a more adequate means of treating shellfish from moderately polluted areas. The results of these studies have been an appropriation of $120,000 for the construction of a new plant by the Division of Marine Fisheries for the treatment of shellfish. The only plant now in operation for the treatment of shellfish is that operated by the city of Newburyport. The following is a table showing the number of barrels handled at that plant beginning in the year 1941:

Deliveries made to chlorinating Plant at Newburyport of Clams taken from Contaminated Areas

Year		*No. of Barrels*	
1941		17,831	97/100
1942		19,412	
1943	Dec. 1, 1942 to June 30, 1943	9,093	127/180
1943	July 1, 1943 to Dec. 31, 1943	9,110	
1943 1944	July 1, 1943 to June 30, 1944	17,324	
1944 1945	July 1, 1944 to June 30, 1945	15,298	13/18
1945 1946	July 1, 1945 to June 30, 1946	14,884	7/12
1946 1947	July 1, 1946 to June 30, 1947	12,123	
1947 1948	July 1, 1947 to June 30, 1948	9,391	
1948 1949	July 1, 1948 to June 30, 1949	12,910	1/5

In addition to annual examinations of shellfish areas, many areas have been re-examined for approval by the Department for the taking of shellfish for purification at a plant approved in writing by the Department. Of this, there are some 15 areas in Boston Harbor which have been approved as suitable for the taking of shellfish for treatment purposes.

The following table shows the number of out-of-state shellfish certificates which were approved during the last nine years:

1941	374	1946	587
1942	344	1947	378
1943	166	1948	229
1944	288	1949	224
1945	255		

Cross Connections

The Department has continued the enforcement of its rules and regulations pertaining to cross connections as adopted February 9, 1937, under authority of Section 160, Chapter 111 of the General Laws of the State. Full time by one engineer and part time by from one to two others has been devoted to the protection of the public water supplies against contamination through cross connection with secondary water supplies.

On May 12, 1942, the rules and regulations were amended so as to continue to safeguard the public water supplies, yet fit any possible emergency, and facilitate the successful prosecution of the war production program. On February 8, 1949, the rules and regulations were readopted in the original form. The original rules and regulations of the Department provide that where a physical cross connection between a pipe containing a municipal water supply and a pipe containing a secondary water existed on December 1, 1937, the date of discontinuance of that cross connection could be temporarily extended with the permission of the Department, provided the public water supply service was equipped with a set of approved double check valves installed in accordance with the Department's specifications

and requirements so that the valves could be readily tested for tightness or be opened for overhauling and repairs. The rules and regulations further provided that after December 31, 1937, no physical connection between the distribution system of a public water supply and that of any other water supply would be permitted. The secondary water classification is interpreted to include reused or recirculated municipal water, sewage and industrial solutions.

The following table shows the distribution and number of approved double-check valve installations which have been permitted in accordance with these rules and regulations:

(Period Ending)	Number of Municipalities having Industrial Plants with Double Check Valve Installations	Number of Industrial Plants having Double Check Valve Installations	Number of Sets of Active Double Check Valve Installations in State
Dec. 31, 1941	125	589	901
Dec. 31, 1942	126	626	956
Dec. 31, 1943	131	639	991
Dec. 31, 1944	133	647	1006
Dec. 31, 1945	133	660	1020
Dec. 31, 1946	133	664	1014
Dec. 31, 1947	134	665	1020
Dec. 31, 1948	134	657	998
June 30, 1949	134	658	1002

In continuing permission to maintain such approved cross connection installations, the Department requires the company owning the installation to test the same for tightness once each month. The Department has made arrangements with the local water works officials whereby one of their employees will test the check valves with the representative of the company once every three months, reporting the results to this Department on forms furnished them. Once a year an experienced engineer from this Department tests each set of check valves, sees that the bonnets are removed and the interiors thoroughly cleaned out, that the rubber facings are replaced when necessary, that moving parts are lubricated, that all gauges and valves are in good working order, that drains are clear and that, on again placing the installation in service, it tests satisfactorily for tightness. Thus, he endeavors to leave the installation mechanically perfect for the ensuing year.

The following table shows the number of such annual inspections made by the Department engineer and records how satisfactorily the check valves met the test prescribed by the Department:

Date (Period) Ending)	No. of sets of Double Check Valves receiving Annual Inspection by State Engineer	No. of sets of Double Check Valves testing satisfactorily before overhauling	Percentage testing satisfactorily	No. of sets of Double Check Valves testing satisfactorily after overhauling	Percentage testing satisfactorily
Dec. 31, 1941	796	605	76.0	788	99.0*
Dec. 31, 1942	902	704	78.0	902	100.0
Dec. 31, 1943	946	760	80.3	946	100.0
Dec. 31, 1944	941	747	79.4	941	100.0
Dec. 31, 1945	881	731	83.0	881	100.0
Dec. 31, 1946	910	761	83.6	910	100.0
Dec. 31, 1947	786	645	82.0	786	100.0
Dec. 31, 1948	878	718	81.8	878	100.0
June 30, 1949	447	366	81.9	447	100.0

*Necessitated through lack of necessary rubber facings, repair parts, etc. Each set was repaired by the company and reinspected by the Department's engineer after a few days. During the interval one check valve protected the public water supply.

From the above table it will be noted that each year approximately twenty per cent of the double check valve installations failed at first to entirely meet the requirements of the Department. The Department's test for tightness is rather stringent inasmuch as it is performed with municipal water pressure entrapped between the inside and outside tightly-closed gate valves and no back pressure is used against the inside check valve. Experience has shown that where the check valves are fre-

quently tested and are properly cared for they usually meet this rigid test but in any case the check valves are overhauled and made to meet this test before the Department's engineer leaves the premises. Our engineer has found that the smaller the size of the check valve, the more likely it is to fail to meet this test for tightness and that in only extremely rare instances is a check valve ever found in such a poor mechanical condition that it is valueless. While the above table does not mean that twenty per cent of the check valve installations would permit contamination of the public water supply, should conditions be right for such failure, it does show that due to neglect the swing-type check valves did not work fast enough to meet the requirements of the Department and further that it is necessary for each check valve installation to be inspected regularly by an experienced man because the Department relies upon the quick and complete closing of these valves in order to protect the public water supply and at the same time protect the drinking water used by plant employees. Since 1937, when the double-check valve method of protection came under control of this Department, there has been no known contamination of a water supply which involved the failure of an approved check valve installation.

Recreational Camps, Overnight Camps or Cabins and Tourist Camps

Chapter 140 of the General Laws was amended by Chapter 416 of the Acts of 1939 to require annual licensing by the local boards of health of all recreational camps, overnight camps or cabins and trailer camps. This law specifies that the Department shall be notified of the granting of such licenses and that the Department shall have jurisdiction to examine the water supply and methods of sewage disposal. Said Chapter 140 was further amended by Chapter 396 of the Acts of 1941 and Chapter 153 of the Acts of 1945. Chapter 396 provided that the owner of the camp should be advised by registered mail relative to the examination of the water supply and sewage disposal while Chapter 153 authorized local boards of health to issue renewal licenses without a notice and hearing. The following table shows the number of camps licensed annually since 1941:

Year	Overnight and Trailer Camps	Recreational Camps	Total
1941	471	184	655
1942	326	156	482
1943	154	109	263
1944	168	152	320
1945	211	126	351
1946	269	151	420
1947	470	208	678
1948	542	203	745
1949	544	208	752

The effect of the war on the number of camps in operation is readily seen from the above tabulation.

The camp licensing law has resulted in providing safe sources of water supply and sanitary works for the disposal of sewage in connection with these camps.

Fluoridation of Water Supplies

Under the provisions of Chapter 38 of the Resolves of 1945, the Division of Sanitary Engineering assisted in the preparation of special legislative reports of the Department of Public Health relative to the decay of teeth resulting from a lack of fluorine (House Document 1608–1945) and a further study and report under the provisions of Chapter 51 of the Resolves of 1946 (House Document 1786).

Fluoride determinations made by the Division of Sanitary Engineering in 1936 and 1937 failed to show fluorine present in any sample in excess of 0.15 of a part per million. Further analyses were made, starting in the years 1944 and 1945, which confirmed the earlier results, except that fluorine in the amount of 1.2 parts per million was found in the water supply in Farnumsville, Grafton; 1.0 part per million in the deep well water supply of Lyonsville at Colrain; 0.7 of a part per million in the deep well at Fisherville in Grafton. Of the 368 sources of water supply analyzed, 97.5% contained 0.20 of a part per million or less of fluorides; 62.2% contained 0.10 of a part per million or less; and the average of all samples was 0.11 of a part per million. The fluoride content of all public water supplies as determined in 1944–45 was published in House Document 1608–1945.

The possibility of relationship between mottled enamel and fluoride content of water consumed was first brought to light in 1931. Studies by public health officials have indicated that the use of water containing excessive amounts of fluorine may result in mottled enamel. Experiments are being carried on in various states as to the effect of the addition of fluorine to drinking water supplies for the reduction in the number of dental caries in children. There has been considerable interest in Massachusetts in the possibility of treating public water supplies with fluorine.

The Division of Sanitary Engineering has assisted the Dental Health Unit in starting certain experimental treatment of two of the institutions' water supply systems with sodium fluoride, using the third institution as a control. It is anticipated that this experimental treatment of water with fluorine will be carried on for a period of two years. Because of the varying qualifications of the public water supplies in the Commonwealth, the Division feels that treatment of public water supplies should be undertaken only with the provision that the hydrological and mechanical set-ups and also the laboratory and dental control are adequate.

Radioactive Isotopes

Radioactive isotopes have become available for distribution through the Isotopes Division of the Atomic Energy Commission and are being used for research purposes at various institutions and for therapeutic purposes at several hospitals in Massachusetts. In order to obtain radioactive isotopes for these purposes it is necessary to satisfy the Atomic Energy Commission that the user is familiar with their handling and use. Only very little supervision of the use of these materials is provided by the Atomic Energy Commission. Monitoring services are available in this State through private groups whereby the users of radioactive isotopes are advised relative to the exposure of individuals. There has been no supervision of the use or disposal of radioactive materials by the State.

It is anticipated that the Division of Sanitary Engineering soon will make a survey of all users of radioactive materials in order to ascertain the safeguards used to protect the workers and the public health and to determine the methods used for the disposal of these materials. Following the survey the need of regulations will be considered.

The Division has assisted the Division of Sanitary Engineering of Harvard University in a short study of the use of radioactive materials for determining the velocity and quantity of water flowing in streams by variation of the so-called salt dilution method. A similar cooperative study is now being made to determine the rate of dispersion of radioactive iodine in ponds and sewage settling tanks. Reports on these subjects are not available as yet.

Bathing Places

While under the Massachusetts laws the Department of Public Health has no specific authority with regard to bathing places, it is the Department's policy upon request from local boards of health, other public authorities, organizations, and, in special cases, individuals to examine indoor and outdoor bathing places.

In advising relative to the construction and operation of swimming pools and other bathing places, it is the practice of this Division to follow the recommendations of the Joint Committee on Bathing Places of the Conference of State Sanitary Engineers and the Engineering Section of the American Public Health Association. In accordance with the recommendations of that committee this Division in passing on the suitability for public bathing of any outdoor bathing water is guided by three considerations: (1) information obtained by a sanitary survey of sources of pollution, consideration of flow currents, etc.; (2) the results of bacteriological analyses of the water; and, (3) the results of chemical analyses of the water. Furthermore, it is the policy not to approve any outdoor bathing places unless suitable and adequate bathhouse, drinking water, and toilet facilities have been provided.

As with various other activities of this Division, the demand for the advice of this Division with regard to the suitability of bathing places, particularly outdoor beaches, has greatly increased, particularly in the past three years. This is shown by the following table:

Year	*Bathing places examined*
1941	54
1942	47
1943	35
1944	60
1945	66
1946	68
1947	126
1948	120
1949	248

Of the 248 bathing places examined during the year 1949, the Department found 100 to be satisfactory; the other 148 were found to be unsatisfactory. A large proportion of the unsatisfactory bathing places were determined to be such, not because of the bacteriological quality of the bathing water, but because suitable facilities had not been provided.

Work at Institutions

During the war years very little work was done in connection with sanitary facilities at State Institutions, both because of the high price and scarcity of materials and the scarcity of labor. The following is a summary of the work done in each of the fiscal years since July 1, 1946:

July 1, 1946 to June 30, 1947

Lakeville State Sanatorium
- Installation of sprinkler alarm switches
- Preparation of specifications for fire alarm system
- Painting of inside of domestic water supply tank } Preparation of
- Painting of fire tank inside and out } specifications

North Reading State Sanatorium
- Repairs and painting boiler feed tank
- Preparation of specifications for centrifugal pump
- Preparation of specifications for installation of Hersey detector meter on domestic water supply line

Pondville Hospital
- Preparation of specifications and repiping certain buildings
- Improvement in refrigerating system
- Painting of fire service tank

Rutland State Sanatorium
- Sewer connections to the "Farm House" and bungalow
- Contract let for new water storage tank and pipe line
- Contract for fire alarm system
- Preparation and specifications for installing water main to the farm buildings

Westfield State Sanatorium
- Preparation and specifications for painting new water tank
- Replacing of piping in the Girls' Building
- Resurfacing of roads on institution property

Bussey Institute
- Installation of oil-burning equipment
- Installation of piping in laboratory equipment

July 1, 1947 to June 30, 1948

Lakeville State Sanatorium
- Painting of fire and domestic water supply tanks
- Preparation of new specifications for fire alarm system

North Reading State Sanatorium
- Preparation and specifications for renewal of piping in certain buildings
- Purchase of Hersey meter for domestic water supply system

Rutland State Sanatorium
- Completion of fire alarm system
- Installation of fire alarm system
- Installation of water pipe line to farm buildings and resetting of hydrants
- Replacement of interior piping in attendants' building

Pondville Hospital
- Replacement of water pipe line in Cottage B

Westfield State Sanatorium
- Preparation of specifications for replacements to old domestic water tank
- Replacing of piping in the Girls' Building
- Painting of old and new water supply tanks
- Repairs to old water supply tank
- Preparation of plans and specifications for improvements to sewage disposal system from Dairy and Farm Buildings

Bussey Institute
- Installation of electrical circuits oil-burning equipment
- Installation of piping in laboratory equipment
- Interior painting third floor
- Calling for bids for outdoor incinerator
- Calling for bids for installation of storeroom
- Calling for bids on replacement of hot water heater and piping

July 1, 1948 to June 30, 1949

Lakeville State Sanatorium
- Letting of contract for fire alarm system

Pondville Hospital
- Replacement of hot and cold water piping in Cottages A, C, D, and part of the "White House"

North Reading State Sanatorium
- Replacement of hot and cold water piping in the Administration Building and in the Nurses' Hall
- Installation of Hersey water meter
- Purchase of centrifugal pump
- Retouching of painting on water tanks done the previous year
- Survey of steam piping

Rutland State Sanatorium
- Installation of water storage tank and pipe line
- Installation of fire alarm system
- Installation of 6-inch water main to farm buildings
- Replacement of water piping in the men attendant's building
- Installation of heater for new fire tank

Westfield State Sanatorium
- Repairs of old domestic water tank
- Preparation of plans and specifications for improvements to sewage disposal system and installation of chlorinator

Bussey Institute
- Installation of outdoor incinerator
- Installation of storage room
- Installation of hot water heater and piping
- Preparation of designs for installation of freight elevator

Housing

The effect of poor housing conditions upon public health has been a problem confronting local and State authorities for many years. Adequate control of housing from the viewpoint of public health requires the adoption and enforcement of regulations establishing basic minimum standards for the maintenance of housing sanitation.

Legislation adopted under Chapter 631 of the Acts of 1947 authorized the Department of Public Health to draw up regulations to establish minimum requirements of fitness for dwellings and also provided for the Board of Standards in the Department of Public Safety to draw up minimum requirements for the construction, alteration, repair and use of buildings with the assistance of the Commissioner of Public Health.

This Department adopted regulations under date of December 6, 1949. These regulations, however, do not become effective unless they are accepted by a city or town. Two towns have accepted these regulations at this time.

Veterans' housing and numerous sub-division developments have presented a problem to local health authorities who in turn have requested the assistance of this Division with regard to water supply and sewage disposal.

Fish Dehydrating Plants

This subject, ordinarily covered under offensive or noisome trades, General Laws, Chapter 111, Section 152, has raised many questions before the Division during the last few years largely because of the fact that fish byproducts from trash fish and waste from edible fillets have offered a good market when converted into fish meal, fish concentrates and other similar products. At the beginning of the period covered by this report, there was a fish dehydrating plant as a part of the works of LePage's Inc., in Gloucester, two in Boston, one on the waterfront of Gloucester Harbor and still another in North Woburn. As the market for fish products improved, two new large dehydrating plants were constructed on the State Fish Pier in Gloucester, a new one in New Bedford and, at the time of writing this report, one additional one is under construction at Wareham and a second one is contemplated in New Bedford. The processes consist of pressing cooked fish for the removal of certain liquid products and for drying the solid matter, grinding it and producing fish meal for animal feed.

Serious complaints have been made relative to the plant at LePage's, Inc., in Gloucester, the Woburn plant and, more recently, the New Bedford plant. These complaints and petitions required the holding of hearings under the said Section 152. Very extensive odor-control devices were installed at the North Woburn plant and at the New Bedford plant which consist quite largely of burning the more objectionable drier gases and scrubbing with water the condensable and soluble gases from other portions of the processes. The situation has been corrected in North Woburn and the petition against this plant was dismissed under date of February 11, 1947. No complaints have been made relative to this plant since the petition was dismissed. The Department is holding on the table the petition on the New Bedford plant. The two new plants on the State Fish Pier, Gloucester, have thus far resulted in no substantial complaint to the Department.

The aggregate capacity of the eight fish dehydrating plants in Massachusetts is approximately 1100 tons per day. It is understood that additional plants are being contemplated.

The experience of this Division shows that the handling of fish, especially trash fish that is not too fresh and has not been iced, is an odor-control problem of the greatest magnitude. At least one of the plants has solved the problem and it is hoped that the others will shortly be under control.

The statutes on noisome trades, General Laws, Chapter 111, sections 143 through 154, are some of the oldest in the laws of this Commonwealth, the first act relative thereto having been adopted in 1692. Many changes have, of course, been made but the odor situation in relation to the operation of fish dehydrating plants was such in 1948 as to result in a further amendment of the statutes by Chapter 480 of the Acts of 1948, which provides that this Department, may advise the board of health of a city or town previous to the assignment of a place for the exercise of a noisome

trade and that any person aggrieved by the action of the board of health in assigning such a location, may, within 60 days, appeal from such assignment to this Department, following which the Department may, after a hearing, rescind, modify or amend such an assignment.

WATER AND SEWAGE LABORATORY

During the period from January 1, 1941, to June 30, 1949, inclusive, the work of the Water and Sewage Laboratory in the State House was devoted chiefly to the chemical analysis and microscopical examination of samples from public water supplies and rivers, while chemical analyses were made of samples collected from semi-public water supplies, bathing beaches, municipal and institutional sewage treatment plants. The following table summarizes the analytical work performed in the State House Water and Sewage Laboratory for the above period:

	1941	1942	1943	1944	*1945	1946	1947	1948	1949
Samples from public water supplies									
Surface waters	1487	1539	1402	1436	–	1546	1394	961	1004
Ground waters	1275	1303	1083	1152	–	1084	1224	949	996
Special samples									
Surface waters	286	257	271	259	–	351	452	390	409
Ground waters	1725	1282	737	897	–	1455	1649	1819	1002
Samples from rivers	1243	1277	1148	1082	–	1279	1672	1634	1388
Samples from sewerage systems and sewage disposal works	898	949	1027	924	–	1190	1119	1015	1096
Samples of wastes and effluents from factories	80	84	64	128	–	79	282	139	116
Samples in connection with Military Surveys	1428	542	52	–	–	–	–	–	–
Miscellaneous samples (Partial analyses)	979	262	318	241	–	352	74	70	111
Total	9401	7495	6102	6119	*6257	7336	7866	6977	6122
Microscopical Examinations	2208	2066	1737	1906	1825	1961	2153	1773	1791

*Not classified as to type of sample.

A considerable amount of field work was done by members of the laboratory staff, principally in connection with problems of corrosion control which occurred in public water supply systems.

In addition to routine work this laboratory undertook a great variety of work often involving complex analytical procedures. Considerable work was done in regard to improving the methods of analysis, especially in connection with fluorides, phosphates, phenols, zinc, cyanides, sulfides, fats, the insecticide DDT, and rodenticides ANTU and 1080. Because of limited budget and laboratory space, the routine work has been curtailed to a minimum in spite of increased demand for laboratory services from the general public. It has been necessary to devote a greater portion of the staff's time to research and special analytical work.

Corrosion Control

Corrosion has been one of the outstanding problems in connection with public water supplies as the waters of this State are seemingly soft with a pH below neutral. The Department has studied these problems extensively both in the laboratory and in the field. Advice has been given to a large number of municipalities where corrosion problems have occurred. Optimum pH has been determined for many of the public water supplies by the use of Langelier Saturation Index and recommendations made relative to the required dosages of lime or soda ash. The Department has made a great effort to impress on the water supply officials that it is very important in corrosion control that the treatment be adequate and uninterrupted if consumer complaints are to be avoided. Inadequate dosages or periods of no dosages at all due to breakdown or clogging of equipment or lack of chemical will entirely nullify any beneficial efforts from the periods of adequate treatment.

The Effects of the Use of Hexametaphosphate Compounds on the Corrosion of Metallic Piping

The use of various polyphosphates, especially hexametaphosphate, to reduce the corrosive properties of potable water supplies began in Massachusetts about 1941. The effectiveness of such treatment has been studied in the laboratory both by laboratory experiments and actual field observations since that time. The following is a brief summary of the results of these observations to date:

Iron and Steel Pipe—The use of hexametaphosphate in connection with the corrosion of iron and steel pipe to reduce "red water" trouble resulting therefrom has been quite successful. If properly applied, threshold treatment with dosages of 0.5 to 2.0 parts per million over a long period of time has resulted in a marked reduction of "red water" conditions.

Copper and Brass Pipe—The use of these chemicals to inhibit corrosion of either brass or copper piping has met with only indifferent success. We have met no instances of any marked reduction in the corrosion of either brass or copper by the use of this type of treatment. We do have some instances where no effect or even a slightly adverse effect on the corrosiveness of the water toward copper and brass has resulted from the treatment with this chemical.

Lead—The laboratory has carried out a large number of experiments with both old and new lead service pipe under controlled laboratory conditions over a period of more than a year. In addition, analyses have been made in connection with this type of treatment where installed in municipalities that had lead service lines in use. In general, we have found that in case of lead pipe the effect of the addition of this chemical on the corrosiveness of the water toward lead pipe depended on the pH of the water. Experiments carried out at pH values of about 6.0 indicated that there is no increase in the corrosive properties of the water and that there are even indications of a slight decrease of such corrosiveness. With waters having a pH of 6.5 to 7.0 there seems to be no marked effect on the corrosion of lead. For instance, numerous samples collected over a period of one year from certain taps in a municipality using this type of treatment and having a surface water with a pH of 6.5 to 6.8 showed no evidence of any marked change of lead content after such treatment was undertaken. However, experiments carried out with waters having a pH of 8.0 to 8.4 showed a very marked increase in the corrosion of both old and new lead service pipe when treatment with hexametaphosphate was undertaken. It would seem that the use of hexametaphosphate with waters having a pH much over 7.0 may result in an increase in the corrosion of any lead service pipe which is present and an increase in the lead content of such waters.

Additional Properties of Hexametaphosphate—In view of the fact that sodium hexametaphosphate has the property of forming soluble complexes with insoluble calcium salts, some question arose as to its possible effect on cement-lined or asbestos-cement pipe. Experiments conducted in the laboratory with two 12-inch sections of 4-inch asbestos cement pipe showed that dosages of 10 parts per million of this compound added to water stored in the pipe had no effect on the solvent action of the water in the pipe. In addition, studies were made in one of our municipalities where this compound was being added to the water at the rate of 2 parts per million. Samples collected over a period of five months from a tap located at the end of a 1600-foot asbestos-cement main showed no increase in the solvent action of the water on this pipe.

Another experiment had to do with the question as to whether the presence of hexametaphosphate in a water would interfere with the ion exchange that takes place in zeolite treatment. It was found that in dosages up to 10 parts per million no such interference took place but in higher dosages zeolite treatment was unsatisfactory.

Inhibitors

The laboratory has had occasion to analyze many commercial compounds sold for the treatment of both potable water supplies and water used in air-conditioning systems. The large majority of these compounds were found to consist of aqueous solutions of sodium silicate with occasional small amounts of compounds such as

chromates, and organic materials. On the other hand, a compound composed of a 35 per cent solution of phosphoric acid together with a small amount of organic matter has also been sold for this purpose. The use of commercial inhibitors in connection with potable water supplies should be avoided.

The Use of Anti-Freeze Materials in Water Supply Lines

Recent developments in the use of such devices as hot water and steam lines embedded in sidewalks and roads for thawing during freezing weather have resulted in the use of various anti-freeze materials introduced into water lines which in many instances are cross-connected with potable water supplies. Requests for advice as to suitable compounds for use in such instances led to a study of the problem and a survey of the field of anti-freeze materials.

It was found that there were over 230 brands of anti-freeze compounds on the market. These generally fall into one of the following categories:

1. *Alcohols*—The alcohols commonly used as bases for anti-freeze are methanol, ethanol, isopropanol, and mixtures of these.
2. *Glycols*—Ethylene glycol and propylene glycol are widely used. Diethylene glycol also has been used.
3. *Salt-Base*—Calcium, magnesium, and sodium chlorides are most commonly used.
4. *Petroleum Base Compounds*—Highly refined petroleum fractions containing no aromatics or olefins. Oils and kerosene also have been used.
5. *Miscellaneous Substances*—Monoethanolamine chloride or other suitable salt of an aliphatic amino base and a strong acid have been used. Honey, sugars, glycerine, trimethylene glycol and diacetone alcohol also have been used.

In addition to the anti-freeze material there are frequently present in the anti-freeze compounds an inhibitor to prevent corrosion as well as other miscellaneous compounds.

A number of these anti-freeze compounds were analyzed in the laboratory. It would appear from these data as well as the data mentioned above that the large majority of anti-freeze compounds available at the present time are entirely unsuitable for use where cross-connections with a potable water supply may exist. Some of the materials such as methanol, denatured ethanol and ethylene glycol are undesirable because of their toxicity. Other compounds in themselves not harmful such as calcium chloride, contain added ingredients in the form of corrosion inhibitors which are quite toxic in character—for instance, chromates.

Corrosion of Lead Pipe

As a result of a complaint of possible lead poisoning due to the consumption of the water of a municipal supply drawn through a long, lead service pipe, a study was made of the corrosion of lead in one of the municipalities having several small ponds as sources of water supply. In this particular municipality lead pipe had been regularly used for service lines up to 1934 or 1935 although since that time no lead has been used for service lines. There are three reservoirs which feed various sections of the town and samples from unusually long, lead service lines on each of these reservoirs were collected for analysis.

It was found that several samples, both running and standing, collected from services supplied by one such reservoir gave amounts of lead far in excess of those specified by the U. S. Public Health Service. Samples collected from the other two gave quantities less than those indicated by the U. S. Public Health Service. Chemical analyses of the three waters are as follows:

	Color	Chlorides	Hardness	Alkalinity	pH
		(Parts per Million)			
Pond A (High lead results)	23	4.3	22	18	6.8
Pond B (Low lead results)	20	4.5	26	25	6.8
Pond C (Low lead results)	15	3.9	15	14	6.6

There is little difference in the corrosive properties of these waters as indicated by chemical analysis to account for the difference in the corrosiveness of these three waters toward lead pipe.

Effect of High Chlorine Residuals on the Corrosion of Lead Pipe

In connection with certain studies on the desirability of using high chlorine residuals to reduce gas-forming bacteria in a large surface water supply, the laboratory was requested to carry out experiments on the effects of water carrying high chlorine residuals as high as 10 to 15 parts per million on the corrosion of lead pipe.

It was decided to study these effects by measuring the solubility of metallic lead and certain lead salts in water carrying these high residuals. The experiments were carried out using a surface water and determining the solubility of lead filings, lead carbonate, lead sulphate and the incrustant material removed from an old lead service and composed of lead carbonates, sulphates, small amounts of iron hydroxide and organic matter.

From experiments carried out in previous years on the effect of small dosages of chlorine on the corrosion of lead pipe, it was felt that the pH of the chlorinated water was of prime importance in determining the corrosiveness of the water with respect to lead pipe.

Where chlorine is added to the water in the form of calcium hypochlorite there is an increase in the pH due to an increase in the hydroxyl ions, but when gaseous chlorine is used there will be a decrease in the pH due to the formation of small amounts of hydrochloric acid by hydrolysis of the chlorine.

The variations in pH are illustrated by the following experiment using Metropolitan water:

Using Chlorine Gas		Using High Test Hypochlorite	
Chlorine Residual (Parts per Million)	pH	Chlorine Residual (Parts per Million)	pH
0	6.6	0	6.6
15	4.1	15	7.3
25	3.6	25	8.0

The effect of chlorinated water on the solubility of lead and lead salts, using both waters treated with chlorine gas and with calcium hypochlorite and a contact period of 30 minutes is as follows:

Lead Content After 30 Minutes' Contact

	With Chlorine Residual of—		
	0 p.p.m.	15 p.p.m. Using Cl Gas	15 p.p.m. Using HTH
	pH = 6.6	pH = 4.1	pH = 7.5
Lead metal (filings) . .	.60	15.5	.65
Lead sulphate . . .	2.9	23.5	2.9
Lead carbonate . .	1.05	16.0	.80
Lead lining from old lead pipe	1.8	19.0	1.6

In addition, the following tables give the results obtained where the contact period was 24 hours:

Using Chlorine Gas
Lead Content After 24 Hours' Contact with Water

	With Chlorine Residual of —		
	0 p.p.m.	10 p.p.m.	15 p.p.m.
	pH = 6.6	pH = 5.7	pH = 4.1
Lead metal (filings) . .	5.0	8.0	23.5
Lead sulphate . . .	13.5	18.0	28.5
Lead carbonate . .	1.7	7.5	15.5
Lead lining from old lead pipe	–	16.0	21.0

Using High Test Hypochlorite

	pH = 6.6	pH = 7.0	pH = 7.5
Lead metal (filings) . .	5.0	6.0	6.5
Lead sulphate . . .	13.5	10.0	9.0
Lead carbonate . .	1.7	1.5	1.2
Lead lining from old lead pipe	–	3.5	4.

From these data it is evident that the solvent action of water carrying a high residual free chlorine content is dependent on the pH of such a water. Where chlorine gas has been used the small amount of hydrochloric acid formed has a solvent action on both metallic lead and lead salts, especially the carbonates, and waters so treated will therefore be more corrosive to both new and old lead pipes. Where hypochlorites are used and there is no marked change in the pH, the solvent action of waters so treated is not markedly affected.

Corrosion of Aluminum

From time to time the Department has investigated complaints of corrosion of aluminum-ware attributed to the use of the public water supply. It has been found that most of these complaints have to do with the pitting of aluminum utensils in which water is allowed to stand for a considerable period of time as, for instance, aluminum pans filled with water and placed on a radiator for purposes of humidification. This type of corrosion is ordinarily to be attributed to galvanic action, the corrosion of the aluminum being due to the presence in the metal of minute amounts of other metals as impurities. Particles of these metals set up minute electrolytic cells with the aluminum, and corrosion takes place. In general, waters in the pH range from 6.5 to 7.0, which constitute a majority of the waters in Massachusetts, are not apt to cause corrosion of aluminum utensils under ordinary conditions of use.

Experiments on Iron and Manganese Removal

Experiments were carried out on a ground water supply for the removal of iron and manganese by chlorination, followed by the addition of lime or soda ash to raise the pH, and subsequent filtration. Coagulation was by mechanical stirring at either 60 or 90 r.p.m. The following tables summarize the results of these experiments:

Effect of the Addition of Soda Ash

	Total Solids	pH	Alkalinity		Hardness	Iron	Manganese	Chlorine Demand
			Phenol-phthalein	Total				
	(p.p.m.)		(Parts per Million)					
Well Raw Water	112	6.0	–	22	35	1.0	.70	1.23
Test No. 1 .	212	9.4	20	110	33	.52	.46	–
100 p.p.m. 60 r.p.m.								
Test No. 5 .	330	10.1	80	228	–	.62	.36	–
225 p.p.m. 60 r.p.m.								

Effect of the Addition of Hydrated Lime

Well Raw Water	112	6.0	–	22	35	1.0	.70	1.23
Test No. 2 . 35 p.p.m. 60 r.p.m.	128	9.4	12	55	61	.53	.46	–
Test No. 8 . 55 p.p.m. 90 r.p.m.	140	10.2	42	80	–	.12	.08	–

These data would indicate that the most effective removal of iron and manganese by this method of treatment can be obtained by chlorination, the addition of lime to a rather high pH, followed by flocculation, sedimentation and filtration.

Phosphorus in Surface Water

Considerable data have been accumulated to show that phosphorus is one of the chief elements in determining the extent of biological activity in surface waters. Occurrence of excessive microscopic growths is limited by the phosphorus content of the water. Ponds having quantities of phosphorus and nitrogen in excess of certain minimum values are far more likely to have frequent occurrences of excessive microscopic growths and consequent difficulties with odors and tastes. For this reason the laboratory has undertaken to determine the phosphorus content of the various surface waters used for public water supplies.

It has been found that in general it can be expected that excessive growths of microscopic organisms will take place when the inorganic phosphorus content exceeds 0.01 of a part per million. Several hundred such determinations made thus far show that all of our public water supply sources so far examined have a phosphorus content less than this critical amount. However, some ponds not used for public water supply and having difficulty with excessive microscopic growths were found to have amounts of phosphorus in excess of this amount.

Use of Marble Chips in Treatment of Acid Wastes

The laboratory has carried out considerable experimental work on the neutralization of acid wastes by flow through beds of marble chips. Both downflow and upflow types of treatment were tried. The following table summarizes the results of treatment of various wastes with the downflow type of bed:

Neutralization of Acid Wastes by Downflow Through Bed of Marble Chips (3 – 5 mm.)

Initial Acidity	Acidity after 5 minutes' contact	pH after 5 minutes' contact
4,100	240	4.0
1,720	100	3.8
1,500	70 alk.	5.6
400	42 alk.	5.7
340	39 alk.	5.7
250	52 alk.	5.8
150	40 alk.	6.2
70	30 alk.	6.3
45	36 alk.	6.4

Using the upward flow type of treatment bed, it was found that effective reduction of the acid content could be obtained with certain size marble chips and at certain rates of flow. The reduction in acidity also was found to vary with the depth of the bed of marble chips. This table gives data on the change in pH and acidity of an acid waste with different depths of marble chips. The following table illustrates the effects of variation in the rate of upward flow:

Depth of Marble Chip Bed (in feet) size 1.5–3.0 (mms)	Acidity of Effluent	pH of Effluent
0	2,800	1.8
1	700	2.0
2	500	2.2
3	300	2.35
4	170	2.5
5	78	2.8
6	24	3.45
7	2	4.1

The rate of upward flow and acidity of effluent are shown in the following table:

Rate of Upward Flow gal. per sq. ft. per min.	Acidity of Effluent
60.	245.*
36.6	182.
20.	41.
10.	0.

The effect of variation in the size of the marble chips, using the same rate of flow, is shown below:

Size of Marble Chips (mms.)	Acidity of Effluent	pH of Effluent
0.5–2.0	212**	2.4
1.5–3.0	310**	2.3

*Initial Acidity 516
**Initial Acidity 590; initial pH 2.0

Treatment of Fish Stick Water

A question arose as to the relative effectiveness of two methods of processing "stick water" obtained at fish-processing plants. The process as ordinarily carried out at local plants consists of passing the liquid through a 90-mesh shaker screen, settling in a tank for about 2½ hours and then skimming off the oil. The remaining liquid then goes to evaporators where it is evaporated to 50 per cent solids content. A newer method consists of more mechanical equipment including screens, decanters and centrifuges. It was claimed that this latter method resulted in a more efficient removal of suspended solids and therefore a reduction in possible carry-over during subsequent evaporations and a consequent improvement in the quality of the condensing water.

A comparison of the two methods of treatment was carried out on a laboratory scale using a sample of untreated "stick water" freshly obtained from a local plant. Portions of the sample were screened through an 80-mesh screen, allowed to settle for one hour and 2½ hours, the oil skimmed off, and then analyzed. Two other portions were similarly treated except that at the end of the settling period the material after skimming off the oil was centrifuged for 15 minutes at 2,000 r.p.m. The following is a summary of the data obtained:

"Stick Water"		Solids (Parts per Million) Total	In Solution	Suspended	Per Cent Reduction	Albuminoid Ammonia (Parts per Million) Total	In Solution	In Suspension	B.O.D. (Parts per Million) Total	In Solution
Untreated	Total	69,200	51,700	17,500	–	2,600	2,300	300	41,000	25,600
	Volatile	56,900	40,000	16,900	–					
	Fixed	12,300	11,700	600						
After screening and settling one hour	Total	57,800	51,700	6,100	65.1					
	Volatile	45,500	40,000	5,500	67.4					
	Fixed	12,300	11,700	600	–					
After screening and settling 2½ hours	Total	55,600	51,000	4,600	73.7					
	Volatile	43,400	39,400	4,000	76.3					
	Fixed	12,200	11,600	600	–					
After screening, settling one hour, followed by centrifuging for 15 minutes	Total	51,400	49,900	1,500	91.4					
	Volatile	39,700	38,600	1,100	93.5					
	Fixed	11,700	11,300	400	–					
After screening, settling 2½ hours, followed by centrifuging for 15 minutes	Total	50,600	49,700	900	94.9					
	Volatile	38,700	38,200	500	97.1					
	Fixed	11,900	11,500	400	–					

Treatment of Combined Municipal and Industrial Wastes

The laboratory has carried out certain experiments in connection with the proposed sewage treatment plant in one of the towns of the State. It was expected that the sewage here would be difficult to treat due to the presence of relatively large volumes of alkaline paper wastes. For instance, a sample of the sewage composited according to the expected flows had a pH of 12.4, a B.O.D. of 1,150 ppm and a suspended solids content of 713 ppm. Samples of the wastes from the various industries in the town, which were to be discharged to the sewage treatment plant, were collected and a composite sample representing the sewage was prepared by mixing industrial waste and domestic sewage in proportions based on flow figures.

In the proposed plant there were plans to use the carbon dioxide gas present in the flue gases for the purpose of reducing the pH of the sewage. Samples of the composite sewage were treated with carbon dioxide gas to reduce the pH to about 9.0, 8.5, 8.0, 7.5, and 7.0. The amount of carbon dioxide gas was measured and, after the pH had been adjusted, the sample was flocculated for 30 minutes and then samples were collected at the end of the following sedimentation periods: 3, 4, 6, 8, and 10 minutes.

The proposed plans also contemplated the use of ferric salts, preferably ferric sulphate. Preliminary experiments with various dosages of this chemical were not very encouraging. Other experiments were then carried out involving the addition of a mineral acid to further reduce the pH.

In addition to these forms of chemical treatment which were those contemplated in the plans drawn up for the sewage treatment plant, the laboratory tried out briefly the use of other chemicals; namely, calcium hydroxide, calcium chloride, ferrous sulphate, and alum, to reduce especially the B.O.D. of the composite sewage.

It was found that none of these chemicals in reasonable dosage would give a satisfactory reduction. The best results as far as B.O.D. reduction went were obtained by lowering the pH of the sewage to 4.0 or less by the use of mineral acid and allowing a sedimentation period after flocculation of at least 30 minutes. Under these conditions, a B.O.D. reduction of about 40 per cent was obtained.

Treatment of Wool Scouring Wastes

The laboratory undertook a series of experiments on methods of treatment of wool scouring wastes. These wastes are characterized by a high B.O.D. content (7,000 ppm in a recent sample), a high grease content (average 4,500 to 5,000 ppm), large amounts of suspended solids (average about 6,000 ppm) and are usually quite alkaline (pH 10.0–12.0). Satisfactory treatment requires a marked reduction of all these ingredients. Having in mind a treatment process involving the use of calcium hypochlorite which has been carried out on similar wastes in certain mills, these experiments were intended to compare that method with other possible methods of treatment.

Using Calcium Hypochlorite

Using calcium hypochlorite, it was found that quantities up to 2,500 ppm followed by one hour's settling had only a slight effect on the wastes. Using 5,000 ppm there was a marked separation with a clear liquid on the bottom of the cylinder and scum on the surface about two inches thick. The original B.O.D. of the waste used was 1,900 ppm; with 2,500 ppm of calcium hypochlorite the residual chlorine of the clear liquid was 97.5 ppm and the B.O.D. of the clear liquid was 1,900 ppm; with 5,000 ppm of calcium hypochlorite the residual chlorine was 452 ppm and the B.O.D. of the clear liquid was somewhat over 800 ppm. Samples treated with quantities up to 50,000 ppm all gave similar separation of grease which floated on the surface and underlying this was a clear straw-colored liquid. Samples of waste, which had been treated at the mill with calcium hypochlorite in the process mentioned above and which have been analyzed in the laboratory in recent years, have in general given similar results; that is, the clear effluent has been very low in suspended solids and grease content but has a B.O.D. of about 800 ppm.

Using Calcium Chloride

Experiments were run with calcium chloride in dosages up to 30,000 ppm. All dosages over 2,500 ppm resulted in a marked separation of the grease and a clear supernatant liquor. The following table gives the data on the results of samples treated with various amounts of calcium chloride:

Table Showing the Effect of the Addition of Calcium Chloride to Wool Scouring Wastes
Analysis of Effluent after 2 Hours' Settling

Calcium Chloride Added p.p.m.	Sus. Solids		Fats		B. O. D.		Vol. of Sludge	Remarks
	p.p.m.	Per cent Removal	p.p.m.	Per cent Removal	p.p.m.	Per cent Removal	X 100 Total Volume	
0	5,900	–	4,500	–	4,900	–	–	
2,500	400	93.	–	–	1,900	–	33.	supernatant liquid somewhat turbid
5,000	115	98.	320	93.	1,230	75.	51.	supernatant fairly clear
10,000	–	–	–	–	850	83.	57.	supernatant clear
20,000	–	–	–	–	–	–	53.	supernatant clear
30,000	14	99.8	63	98.5	750	85.	43.	supernatant clear
50,000	–	–	–	–	–	–	32.	–

In addition, the following chemicals were tried: sodium hypochlorite, calcium hydroxide, and calcium hydroxide, followed by the addition of carbon dioxide. These experiments indicate that satisfactory removal of fats and suspended solids and marked reduction of B.O.D. content can be obtained using proper dosages of calcium hypochlorite, calcium chloride or calcium hydroxide. The results obtained with calcium chloride are in general about as good as those obtained with similar dosages of calcium hypochlorite, with the exception that the B.O.D. of the effluent is somewhat higher, the difference in B.O.D. of course being due to oxidation by the large amounts of chlorine in the hypochlorite. Calcium chloride treatment has the advantage in that the sludge carrying the fats is precipitated to the bottom of the tank, whereas with calcium hypochlorite the sludge rises as a scum to the surface and a portion tends to settle to the bottom. Calcium chloride is of course considerably cheaper to use than calcium hypochlorite. Calcium hydroxide also can be used but only in very large dosages. Where the effluent from this treatment process is to be subsequently treated by biological filtration processes it would seem that the treatment with calcium chloride is by far the preferable method because the effluent contains no bactericidal substances such as free chlorine or caustic alkalinity which must be neutralized before biological treatment. Dilution of the waste with water before treatment with calcium chloride seems to help in rapid settling of the sludge. Quantities of calcium chloride in excess of 2,500 ppm can be used possibly with aeration of the treated waste before settling. The settled waste will then be quite satisfactory for use on any biological filter.

Treatment of Cyanide Wastes

The laboratory has carried on experiments on the treatment of cyanide wastes by chlorination for some time and the data obtained agree in general with the voluminous literature since published on the subject. The following practical applications of this method are illustrative of the results which can be obtained and practiced.

Three samples of plating wastes, namely, a sample of nickel-plating waste, silver-plating waste, and plating wastes from the findings department, were used in these experiments. The original cyanide content of these wastes was found to be as follows:

Waste	Sodium Cyanide Content (Parts per million)
Nickel-plating	3,800
Silver-plating	11,260
Findings department	20,520

It was found that satisfactory reductions of the cyanide content of such wastes should be obtained by the use of sodium hypochlorite solution. The following table indicates the amounts of commercial sodium hypochlorite solution required for this purpose:

Waste	Amount of Commercial Sodium Hypochlorite Solution Required (Gallons per gallon of cyanide waste)
Nickel-plating	.08
Silver-plating	.25
Findings department	.40

With sodium cyanide concentrations of 4,000 parts per million or less, the treatment process consists merely of adding the correct volume of hypochlorite to the original vat, stirring for about 15 minutes to one-half hour, and then disposing of the wastes. The cyanide concentration of the treated waste is negligible. With sodium cyanide concentrations of over 4,000 parts per million, treatment with sodium hypochlorite results in a marked increase in temperature and the evolution of a certain amount of gases such as ammonia and carbon dioxide. Such wastes which in addition require larger volumes of hypochlorite solution should preferably be treated not in the original vat but drained into a separate tank located in a well-ventilated space. The contact period, however, is about the same, one-half hour. The use of bleaching powder in place of sodium hypochlorite is unsatisfactory, but a combination of bleaching powder and caustic soda can be used.

Effect of Storage on Distillery Wastes

In connection with the study of the treatment of wastes at a large distillery in one of the cities of the State, the question arose as to the effect of 48 to 72 hours' storage of the waste materials, consisting of thick slops, thin slop and syrup, on the quality of these substances to be used as feed materials. Half-gallon, glass-stoppered bottles partly filled with samples of these wastes were kept in the laboratory at room temperature of about 75°F. The samples were tested daily to determine any change in the odor of the material or the change in pH. The following table summarizes the results:

Period of Storage (75° F.)
(Hours)

	Start		24		48		72		96		120		144	
	pH	Odor	pH	Odor	pH	Odor	pH	Odor	pH	Odor	pH	Odor	pH	Odor
Thick Slop	3.83	Cereal	3.83	Cereal	3.83	Cereal	3.83	Cereal	3.83	Cereal	3.83	sl. sour	3.83	sl. sour
Thin Slop	3.85	Cereal	3.83	Cereal	3.83	Cereal	3.83	Cereal	3.83	Cereal	3.83	Cereal	3.83	Cereal sl.
Syrup	3.83	Cereal	3.83	Cereal	3.83	Cereal	3.83	Cereal	3.83	Cereal	3.83	Cereal	3.80	musty, sour

Treatment of Tannery Wastes

A. *Removal of Sulfides from Tannery Wastes:*—Experiments were carried out on the effectiveness of various iron salts including ferrous and ferric sulfate and ferric chloride in removing soluble sulfides from dilute and concentrated tannery wastes. In using ferric chloride on dilute sulfide wastes (265 parts per million of sulfides as hydrogen sulfide) and concentrated wastes (2,000 parts per million hydrogen sulfide) it was found that the amount of soluble sulfides removed was approximately proportional to the amount of ferric chloride added. For complete removal of the sulfides an amount of iron salts about 10 per cent in excess of the theoretical must be added. In the laboratory, satisfactory sedimentation, when using this dosage, was obtained in less than one hour. Likewise, using ferrous sulfate, it was found that a dosage similar to that of ferric chloride gave satisfactory removal of the soluble sulfides.

B. *Experiments on the Treatment of a Municipal Sewage and Tannery Wastes:*—In connection with studies of a proposed municipal treatment plant, experiments were carried out to determine the effect of the addition of certain quantities of tannery wastes to the municipal sewage.

Experiments also were carried out on effects of plain sedimentation of this municipal sewage and on mixtures of this sewage with various amounts of the wastes from the tannery. The proportions of sewage to waste used were those indicated by the rates of flow determined on the day the samples were collected. Experiments also were carried out on the treatment of composite wastes from the tannery by plain sedimentation and by chemical treatment followed by sedimentation. The chemicals used included alum, ferric sulfate, carbon dioxide gas, mineral acid, ferrous sulfate, and ferric chloride. The results obtained from the use of the latter two are not reported since they were quite similar to those obtained with the other coagulants. The data obtained are summarized in the following tables:

Results of Treatment of Municipal Sewage and Tannery Wastes

Table No. 1—*Municipal Sewage*

Period of Sedimentation	Suspended Solids		B.O.D.		
(Hours)	p.p.m.	Per Cent Removal	p.p.m.	Per Cent Removal	pH
Municipal Sewage—Treatment: Plain Sedimentation					
0	244	–	200	–	6.7
1	64	74	106	47	–
2	40	84	92	54	–
Municipal Sewage + Tannery Wastes.—Treatment: Plain Sedimentation (Combined in the proportions 1.6 m.g.d. : 314,000 g/d)					
0	330	–	250	–	9.2
1	137	58.5	165	33.	–
2	92	72.	155	37.5	–
Municipal Sewage + Tannery Wastes. — Treatment: Plain Sedimentation (Combined in the proportions 3.4 m.g.d. : 314,000 g/d)					
0	301	–	210	–	8.6
1	121	60.	115	45	–
2	88	71.	110	48	–

RESULTS OF TREATMENT OF MUNICIPAL SEWAGE AND TANNERY WASTES

TABLE NO. 2—TANNERY WASTES

Period of Sedimentation (Hours)	Suspended Solids p.p.m.	Suspended Solids Per Cent Removal	B.O.D. p.p.m.	B.O.D. Per Cent Removal	pH
Treatment: Plain Sedimentation					
0	750	–	540	–	11.7
1	288	62	370	31.5	–
2	190	75	300	45.	–
Treatment: Addition of Alum (100 p.p.m.) followed by Sedimentation					
0	750	–	540	–	11.4
1	270	64	240	55	–
2	260	65	230	57	–
Treatment: Addition of Ferric Sulphate (300 p.p.m.) followed by Sedimentation					
0	750	–	540	–	10.8
1	48	93.6	200	63	–
2	46	93.9	180	66.5	–
Treatment: Addition of CO_2 followed by Sedimentation					
0	750	–*	540	–	8.1
1	363	52*	295	45	–
2	172	77*	285	47	–
Treatment: Addition of H_2SO_4 (900 p.p.m.) followed by Sedimentation					
0	750	–	540	–	6.1
1	172	77	280	48	–
2	170	77	270	50	–
Treatment: Addition of H_2SO_4 (1000 p.p.m.) followed by Sedimentation					
0	750	–	540	–	4.5
1	18	97.6	250	54	–
2	15	98.0	250	54	–

*A large proportion of the suspended solids consisted of a fine precipitate of calcium carbonate.

MISCELLANEOUS RESEARCH

In addition, the laboratory engaged in many activities. For instance, a good deal of time was devoted by the laboratory force to investigations of complaints of offensive odors emanating from industrial operations, pollution of streams, dumps, and other sources. Interesting work has been carried on in recent years on the chemical treatment of aquatic plants. Successful results have been obtained on the treatment of Lemna and Elodea with certain esters of 2, 4–D. During the war, especially, work was done on the use of replacement oil instead of linseed oil in paint formulas for red lead paint for painting the interior of stand pipes. It appeared that such paints, while inferior in lasting quality, were satisfactory for the purpose. Experiments were carried out on a smaller scale on paper and many other types of industrial waste.

THE LAWRENCE EXPERIMENT STATION

During the nine-year period, 1941–1949, the research work of the Experiment Station in connection with the filtration and other purification of water and the disposal of domestic sewage has steadily expanded: meanwhile the participation of the Station in the engineering work of the Division, beginning in the early war years has very greatly increased, and in the past year and a half a sanitary engineer has

been assigned as a member of the staff at Lawrence. This work involves not only the collection of samples but assistance and instruction to operators of water and sewage plants in both laboratory and engineering fields in general and in specific problems and difficulties, the supervision of shellfish treatment plants, and particularly the construction and operation of experimental treatment plants which were in most cases adaptation of experimental work at the Station. A great deal of the work has been in latter years in connection with stream pollution and the treatment or disposal of industrial wastes.

The following table summarizes the samples examined at the Station during the period:

	1941	1942	1943	1944	1945	1946	1947	1948	1949	Total
Chemical samples in connection with the investigation of the disposal of domestic sewage, filtration of water and of rivers and bathing places	2,120	2,186	2,740	2,584	3,344	3,232	3,208	3,023	3,799	26,236
Chemical samples in connection with the investigation of industrial wastes	196	329	145	223	217	381	390	645	817	3,343
Chemical and mechanical samples of sand and other filtering materials	249	386	183	106	260	225	281	164	325	2,179
Total Chemical	2,565	2,901	3,068	2,913	3,821	3,838	3,879	3,832	4,941	31,758
Bacterial samples in connection with water supplies, bathing places, stream pollution, and all other regular work of the Department	19,526	16,783	17,010	17,542	13,600	14,416	15,583	15,588	16,156	146,204
Bacterial samples in connection with military camps and adjacent areas	1,379	1,274	471	182	30	–	–	–	–	3,336
Bacterial shellfish samples	768	768	723	1,111	963	687	1,200	577	913	7,710
Total Bacterial	21,673	18,825	18,204	18,835	14,593	15,103	16,783	16,165	17,069	157,250
Grand Total	24,238	21,726	21,272	21,748	18,414	18,941	20,662	19,997	22,010	189,008

The collection and examination of samples in or near military areas was only part of the cooperation given the Armed Forces during the war years; in addition to these analyses much other assistance was given in the form of loans of apparatus and supplies, participation in water and sewage problems, and particularly work on certain industrial waste problems.

In connection with public water supplies, work involving more than collection and analysis of samples has been carried on in cooperation with fifty-two water departments and the Metropolitan Water Supply. This work has included especially assistance in filtration and coagulation problems, chlorination and other disinfection, colors, odors and tastes, cooperation in laboratory control work, including the training of personnel and the installation of new or enlarged laboratories, control of corrosion and especially assistance in regard to new and emergency supplies. The Station also has taken an active part in the expanding stream pollution program and the stream classification work in connection with the New England Interstate Water Pollution Control Commission. There has also been a large amount of work on private and semi-private supplies and on bathing beaches and swimming pools.

In field work in connection with the disposal of sewage, the results of the general research work of the Station have been applied to the usual problems of sewage treatment and in addition in many cases specific investigations have been conducted both at Lawrence and in the community under study. Many of the older treatment plants have been given assistance in operation and in laboratory control and in special problems, especially those relative to sedimentation and filtration of sewage and digestion of sludge. In most of the newer plants, the plans have been largely influenced by the work of the Station, and in every case plans submitted have been examined in light of our previous experimental work, and in several cases additional specific work has been done, frequently resulting in modification of quantities or of

procedure. Analyses of filtering material and especially assistance in furnishing specifications for such material have been given, not only for municipal and large private plants, but very frequently for home disposal areas especially in housing developments.

Shellfish Research

In the field of shellfish sanitation, the Station has continued through the entire period to exercise supervision over the Newburyport Shellfish Treatment Plant by means of frequent visits, check bacterial examinations and other observations as well as assembling and averaging records of plant operation. Throughout the period experiments have been carried on for improvement of the cleansing process, and beginning in 1947 very intensive studies were made as part of the shellfish investigation which resulted in the Reports of the Special Commission from 1947 on and plans drawn up from time to time as a result of that work.

In 1943 it seemed possible that a certain type of disease known as mussel poisoning which had been prevalent on the Pacific coast and in Europe for many years had appeared among the shellfish on the eastern coast, and this threat seemed so serious that the U. S. Public Health Service had forbidden the taking of any shellfish. To investigate the possibilities of this infection the Experiment Station, together with the Biological Laboratories, investigated the shellfish from every area in Massachusetts and also performed a very considerable amount of similar work on samples from adjacent states. As a result of these investigations it was shown that the possibility of danger from mussel poisoning was extremely slight.

Ever since 1904 research in methods of analysis and preparation of shellfish for analysis have been studied at the Station. As a result of the report of the *APHA Shellfish Committees in 1941 and later and the adoption of the maceration methods suggested by that Committee, the Experiment Station began an intensive study of such methods; it was shown that maceration methods were far from being standardized and that the correlation with the older method of scoring of shell liquor was extremely poor. Correspondence with the U. S. Public Health Service and the representatives of other states led eventually to a very complete study in which the Station participated, not only on methods of preparation and of analyses but in regard to the relatively low importance of shellfish analysis as compared to sanitary surveys of areas and bacterial analyses of overlying waters. The U. S. Public Health Service at that time proposed that a maximum MPN of 230 should be set for all shellfish, and the investigations of the Experiment Station showed that this would practically prohibit the digging of any clams from Massachusetts beds. Further negotiations with the U. S. Public Health Service resulted in an immediate modification of the proposed standards with the eventual result that no final mathematical limit was set but that the responsibility for proper sanitary values of shellfish was continued with the individual states. In 1944 the work was incorporated in an extensive report which covered the items named above and included important epidemiological studies by the Department biologists and observations on the sanitary surveys and their significance by the engineers of the Division. In the meanwhile the Station has participated in the work of many national committees studying shellfish problems and has been given representation on the Committee of Shellfish Consultants of the U. S. Public Health Service.

Beginning in 1946 consideration was given to the possible role of aquatic birds in the contamination of shellfish. As a result, cooperative studies were begun with the U. S. Public Health Service and the Federal Fish and Wildlife Service on this problem.

During this period investigations were made of the sterilizing effect of cooking on various types of shellfish, both in the home and in commercial establishments. It was definitely established that many methods of cooking did not completely sterilize shellfish.

In 1949 investigation was made in a field closely allied to shellfish, that is in the sanitary quality of crab meat and lobster meat. Experiments showed that if these meats were prepared as a result of proper cooking complete sterility would result but that many commercial practices fall far short of this result.

*American Public Health Association

Water Bacteriology Research

In the field of research in water bacteriology, the State has made many investigations in the past 9 years. Throughout this period, studies have been made on the performance of many discriminatory media, proposed by others or developed by the Station for the purpose of differentiating various members of the coliform group bacteria. Several times it has been reported that in general most discriminatory media either tend to reduce the numbers of coliform bacteria found or fail to give the proper differentiation. In the study of the ordinary Imvic reactions, many continuous studies have shown that temperature of 30°C. rather than the old standard 37°C. gives much more satisfactory results. The 9th Edition of Standard Methods set up confirmation on Brilliant Green Bile medium as a practical equivalent of the normal completed test and many thousands of cultures have been examined at the Station by means of the two methods; the general results indicate sharp differences between the two proposed methods, especially in that many organisms which properly should not be considered as coliform bacteria with sanitary significance may be so reported if BGB is the only criterion, and further that many false fermenters may be reported as significant organisms.

Another important step in regard to false fermentation showed that these were occurring practically throughout the entire State but were particularly prevalent in the Metropolitan water supply. Study of thousands of cultures eventually led to the discovery that in a great measure this fermentation was due to the symbiotic action in which one or more organisms reduced the lactose of the standard culture tube to dextrose and that other organisms were then able to produce gas in the dextrose thus formed. Those organisms were found to be particularly resistant to chlorine. The general conclusion to be drawn from the study was that the occurrence of these organisms apparently had no sanitary significance. During the war, in connection with civilian defense it seemed wise to make arrangements for emergency control and examination of public water supplies both in connection with possible contamination by war gases and in connection with possible breakdowns of pumps, power lines and other facilities. A method of emergency bacterial examination was developed and taught to 200 men and women participating in civilian defence. A valuable by-product of these courses of instruction was the training of many volunteer assistants who were at least able to collect proper representative samples in case of emergency.

From time to time the Station has conducted investigations into bacteriostatic and bactericidal agents not only of standard disinfectants prepared for the purpose, but of many other chemicals which are not primarily intended for action on bacteria. These works included an extensive study on the bacterial effects of DDT which might be sprayed into reservoirs and public streams which might be used for public water supply and included also the effect of these chemicals on odors and tastes. It was found in general that DDT in the quantities commonly used had no significant effect on the bacterial content of water supplies and that in general neither odors nor tastes on a significant level were caused. Another interesting study was on the possible effect of the 2-4D weed killers developed for the purpose of restraining or killing broad leaf weeds; it was shown that if any reasonable concentration was used in or around sand filters that the weed killers had no deleterious effect on the biological action of the filter.

During the early part of the war the Station was asked to study Halazone tablets which were composed of a chlorine-bearing substance dispensed in such a size as to give adequate disinfection to a canteen of water and expected to be applied by the members of the armed forces in the field. Our investigation showed that the tablets were far from uniform in size and in chlorine content and that they were very difficult to dissolve. Furthermore, even when complete solution had been obtained, the available chlorine was not sufficient to disinfect satisfactorily water containing any considerable amount of organic matter.

The bacterial laboratory of the Experiment Station has carried on a very considerable amount of work in connection with the new Stream Pollution Programs and has been particularly valuable in preparing material for stream classification. Part of this work at least had been directly connected with the incidental effect of many industrial wastes on the bacterial content of water.

The Station has participated in an intensive study on degradation of water in distribution systems conducted under the auspices of the American Water Works Association. Similar work has been done from time to time in connection with chlorine troubles and particularly with the presence of tastes and odors in distribution systems. It seems from this work that with many of our soft New England waters large numbers of bacteria are always present in the bacterial slime deposit in the pipes. Some of these studies have shown that active oxidizing agents such as chlorine dioxide in the presence of chlorine may give very satisfactory reduction in the numbers of these bacteria present. Information has also been gained in the probable role of some of these bacteria in the chemical degradation of water.

For the past year the Experiment Station has been participating in research work in connection with the bacterial sections of the forthcoming Standard Methods for Examination of Water and Sewage, particularly in regard to discriminatory media and to the effect of time and temperature on stored bacterial samples. Similar work had previously been conducted by the Station in connection with the 6000 samples from public water supplies which are received each year. During the summer of 1949, preliminary studies on the effect of ultrasonic waves on bacteria were conducted at the Experiment Station.

Water Treatment Research

Investigation of methods of water purification during this period included the continuation of the long-time storage studies in which Merrimack River water is stored in the dark for approximately 30 days. Analysis of the raw and stored water has shown that the bacterial content of the water may be reduced as much as 99% and also that significant reductions in the chemical suspended matter are obtained. Because the storage basins are covered there is very little reduction in color. A series of sand filters which receive both stored and unstored water have shown that the bacteria remaining after storage are more difficult to remove by sand filtration than those in the original water. However, the final result of storage and filtration gives a water extremely satisfactory in bacterial content as well as in chemical characteristics.

Two large size coagulation and filtration systems were operated with special studies on optimum coagulation and also on secondary filtration at low rates of water previously treated at rapid rates. It was found that when the filter operating at rapid rates was properly operated that very nearly complete reductions in bacteria could be obtained and that further filtration gave relatively insignificant removal. However it was possible by careful operation of both steps of the process to obtain almost completely sterile water. A considerable amount of work was done on both these filter systems, repeating work previously done at the Station in regard to the precipitation of mats of coagulant on the upper surface of the filter which it was hoped might result in the need for less rigorous control of coagulation and possible operating economies. However, these experiments as well as the ones conducted earlier indicate that satisfactory results could not be obtained.

The appearance of very high numbers of bacteria in water supplies in which various phosphates were used as part of the treatment process led to an intensive study of the part played by phosphates, especially the polyphosphates, in water. A series of papers written on the subject showed that in both ground water and surface water enormous increases in the total number of bacteria and in the number of coliform organisms as well as considerable increases in pathogenic organisms such as E. typhi took place. These things occurred in the presence of polyphosphates in fairly high concentration but in the concentrations finally used in treatment of water supplies, the effect was relatively small. It was also found that certain phosphates might have valuable application as bacteriostatic agents in experiments where it is desired to maintain a constant number of bacteria. It was also shown that phosphates resulting from the partial decomposition of hexametaphosphates likewise stimulated bacteria and that the presence of certain inorganic acids might also stimulate the effect of phosphates. Various other investigations showed that there was little difference resulting from the presence of sodium or potassium iron and that nitrogen in various forms had a slight inhibiting effect for a short time but later on resulted in further increases in the effect of the phosphates. As a result of

these papers the manufacturers of stock phosphates advised water supplies using these materials to add chlorine or other sterilizing agents to the stock solutions.

During the war the shortage of alum made it desirable to study the effects of other coagulants in water treatment and in several plants the results of experiments on various iron salts were applied with considerable success. Likewise, wartime shortages of chlorine led to investigations of the possible use of bromine and later on chlorine dioxide as water disinfectants. In a series of papers on this subject it was reported that disinfection by bromine was possible although at greater expense as compared to chlorine; that organic matter in water affected the bromine to a much greater degree than it did chlorine and that while against pure cultures in sterile tap water or in sterile distilled water bromine was practically as effective milliliter for milliliter as chlorine, in water containing any particular amount of organic chlorine or bromine demand, bromine became progressively less valuable as compared to chlorine. It was also reported that bromine had a very considerable flash effect but that the residual effect of bromine was very considerably less than that of chlorine.

In regard to chlorine dioxide, it was reported that this material can be used very successfully as a bactericide but that, very much like bromine, its action was considerably less in the presence of even small amounts of organic matter as compared to the action of chlorine. It was likewise found that chlorine dioxide had somewhat less residual effect than equivalent amounts of chlorine, and that the bacteridical value of dioxide is not nearly as much affected by change in pH as is that of chlorine. It was also found that chlorine dioxide generally did not produce the disagreeable chlorophenol tastes which result from treatment by chlorine alone.

As a result of these studies and the work of others, chlorine dioxide and chlorine were used successfully in the water supply of the city of Chicopee where very disagreeable odors and tastes had for a long time been encountered. In another paper it was reported that provided proper doses of chlorine were used as the main disinfecting agent, appropriate doses of chlorine and chlorine dioxide gave very satisfactory results in the reduction of odors and tastes and had a very important action in reducing the numbers of bacteria present in the distribution system. Further studies with chlorine dioxide showed that in many cases this agent was very valuable in reducing tastes and odors resulting from such diverse causes as iron, manganese, oils, detergents and other dispersing agents and organic tastes produced by turnover in reservoirs.

The Station has studied continuously the effect of chlorine on bacterial removal and on the causing or prevention of tastes in water. It was been found for instance that extremely small amounts of certain new chemicals either resulted in the appearance of very small amounts of phenol in the water which when chlorinated gave disagreeable chlorophenol tastes and it was found that in many cases, especially in the softer waters, that super-chlorine or the so-called "breakpoint" did not result in complete removal of these tastes and odors. In many other places, however, superchlorination was found to give completely satisfactory results. As a result of these contradictory findings, it was recommended that individual studies of each water be made in regard to disinfection by chlorination. It was also found, especially in the water supply of the city of Lawrence which had as its source a river containing considerable amounts of organic matter and of industrial wastes, that treatment with activated carbon was satisfactory at certain periods only when extremely high concentrations were used. Other studies in regard to disinfection and removal of odors and tastes indicated that step addition of chlorine produced more satisfactory results and frequently resulted in more economical operation than when the indicated amount of chlorine was applied at one time. Many experiments were conducted on the treatment of water by such agents as activated clays, but most of these indicated that in most of our waters such agents are generally not satisfactory.

The general softness of Massachusetts waters brought many problems in regard to corrosion, and in about 25 communities assistance was given in the field in the addition of suitable alkaline materials to overcome or reduce this corrosion. This work necessitated the conducting of many experiments particularly in regard to the application of the Langelier Index and similar formulas to the New England waters which are generally very low in dissolved solids content. The general use of cement-lined pipe in Massachusetts is a valuable aid in the reduction of corrosion but in many cases the pipe when first in use yields a water very high in pH which fre-

quently results in disagreeable tastes. In several communities assistance has been given in regard to early curing of this pipe and removal of the tastes and odors.

The Station has been increasingly active in the study of tastes and odors produced by algae and similar organisms and likewise has been of assistance to several water departments in regard to filtration problems resulting from large growths from such organisms.

Chemical treatment for the correction of corrosion was applied at the North Reading State Sanatorium where it was particularly important to present a water as low in metals as possible for the children who are patients at the institution, and where it was also necessary to restrict as far as possible the use of chemicals in treatment in order to avoid intestinal disturbances in the children involved. At the Tewskbury State Hospital peculiar circumstances in connection with large amounts of iron and manganese caused serious deposits in the transite pipe used to carry the water supply to the institution; development of a method of penetrating this coating by chlorine and detergents resulted in removal of the deposits and a large increase in the capacity of the pipe. This treatment has been employed several times with very satisfactory results.

In connection with the growing interest in the use of fluorides in water to reduce dental caries, this Station has conducted a considerable amount of experimental work and has analyzed many of the water supplies of the State, practically none of which contains any significant amount of fluorides. Determinations of total and of available fluoride of various foods, especially seafoods, were also made. In order to facilitate field work, a short method of analysis of fluorides was developed and we were able to put this in such a form that field determinations could be readily made.

In connection with the sanitation of bathing places, the Station has made very many bacterial analyses. In addition, instruction has been given to personnel in various cities and towns so that they might control bathing places, and simple methods of application of chlorine and determination of available chlorine have been shown to much of this personnel. In connection with bathing beaches and swimming pools where filters are used, the staff at the Station has conducted many field experiments and has likewise given instruction to operators. The Station has been particularly interested in the use of diatomaceous earth filters for swimming pool treatment, and extensive experiments have been operated both at the Station and at indoor and outdoor pools. As a result of these experiments, it has been concluded that diatomaceous filters properly operated at safe rates can furnish very satisfactory treatment for swimming pools.

Sewage Treatment Research

The work in connection with the sewage research of the Station has included studies of sedimentation, including the operation of an Imhoff tank, six septic tanks with subsurface disposal areas, activated sludge tanks, over 50 trickling filters, and secondary sand filters.

The sewage used in experiments is pumped from one of the main sewage lines of the city of Lawrence, selected because it is almost completely free of industrial wastes, to holding tanks so arranged as to reduce sedimentation to a minimum, and thence by automatically controlled pump to an elevated settling tank, which has an average detention period of less than two hours. From this tank a uniform settled sewage is distributed by gravity to all the experimental filters. During the nine years the average B.O.D. of the raw sewage was 384 ppm, and that of the settled sewage 311 ppm, a reduction of 19%. In individual years the percentage reduction has been as low as 10% and as high as 33%. The reduction in suspended solids has ranged from 60 to 35%, with an overall average of 43%, from 212 ppm in the raw sewage to 122 ppm in the settled.

The Imhoff tank in use does not have sufficient capacity to furnish all the sewage required for experiments, and therefore only a small portion of the sewage receives treatment in this tank, resulting in a detention period much longer than normal. The average suspended solids in the effluent have been 70 ppm, a reduction of 67%, and the B.O.D. 177 ppm, a reduction of 54% from the raw sewage.

Two activated sludge tanks were operated during the nine year period. One of the tanks consisted of three compartments in series, each about 75 inches deep with

an overall capacity of 700 gallons. This tank had all the necessary settling tanks, surplus sludge storage and aeration tanks and apparatus for returning the sludge to any of the three compartments. The other tank consisted of three rectangular tanks in series with a water depth adjustable to 12 to 40 inches. This tank was also provided with all the necessary facilities for activated sludge operation. The average detention period in the first tank was about 3½ hours and the amount of air was varied from time to time with quantities as low as 0.6 of a cubic foot per gallon of sewage treated to as high as 1.5 cubic feet. The overall removal of B.O.D. from the settled sewage applied to the effluent of the final settling tank was 85% and the removal of suspended solids was 47%. There were no significant differences in performance which could be attributed to the amount of air being applied. The second tank was continuously operated with one cubic foot of air per gallon of sewage treated. The average reduction of B.O.D. in this tank was 83% but the removal of suspended solids was 59% which is significantly higher than the results obtained in the first tank. Experiments indicated that the shallower tank and the relatively stable amount of air used gave a final floc which settled more rapidly than the deeper tank. In both of these tanks air enriched with an additional 20% of oxygen, and for a period of about two weeks pure oxygen, was used in place of normal atmospheric air and the results of these experiments indicated that neither enriched air nor pure oxygen gave results as good as those normally obtained with atmospheric air.

Septic Tanks

During the nine years a series of septic tanks have been operated to study particularly the effect of detention time and to furnish material for flooding subsurface disposal areas. Four tanks were operated throughout the nine years; two others, Nos. 719 and 720, for seven years. All of the tanks are simple concrete boxes, with each compartment twice as long as its width; all have a water depth of 40 inches with an air space of 3 to 4 inches; the inlets and outlets are submerged tees. The compartments of the two-compartment tanks are built side-by-side with the common wall between the tank cut off so as to provide an end-around baffle. Tank No. 507 has received the fresh sewage of the Station; all the other tanks have received the settled Lawrence sewage used in other experiments. The following table describes the tanks and the method of operation:

Tank No.	No. of Compartments	Capacity Cu. ft.	Receives	Detention Period, days
719	1	23.3	Settled sewage	⅛
691	2	53.3	Settled sewage	½
720	2	46.7	Settled sewage	1
508	2	53.3	Settled sewage	2
690	2	53.3	Settled sewage	4 (1946–1949)
690	2	53.3	Settled sewage	6 (1941–1945)
507	1	26.7	Fresh station sewage	2

All the tanks are opened once each year for sludge measurement and analysis, and any sludge in excess of 4 to 6 inches in depth is removed before the tanks are again put into operation. The average accumulation of sludge in Tank No. 507, which has received fresh Station sewage has been 7.4 inches; the greatest average accumulation in any of the other tanks has been 2.6 inches in the first compartment of No. 691.

It has been found that the destruction of material deposited was much greater in the tanks with short detention periods as compared to those with longer detention; for instance, Tank No. 719 destroyed 74, 88 and 87% respectively of the solids, nitrogen and fats deposited in the tank, while for No. 508, the percentages were 48, 58 and 54, and for No. 690, during the time when its detention period was six days, the percentages were 43, 43 and 48.

The removal of total B.O.D. is roughly proportional to the length of the detention period, with 29% of the total B.O.D. deposited being destroyed in Tank No. 719, as against 56% in No. 690; but in removal of suspended B.O.D. the difference was much less, with percentages of 53 in No. 719 and 65 in No. 690. The effect of detention period of destruction of material is shown in the following table in terms of pounds per year per cubic foot of tank space. It is noticeable in most respects that Tank No. 507, which has received very fresh sewage, shows greater removals than any of the tanks which have received settled sewage, which is relatively less fresh and of course also contains relatively less suspended matter.

Tank No.	Days Detention	Pounds of Material Destroyed per Year per Cubic Foot of Tank Space		
		Solids	Fats	Nitrogen
719	⅓	1.90	.54	.137
691	½	1.74	.36	.072
720	1	.65	.24	.054
508	2	.54	.08	.022
690	4	.23	.09	.016
690	6	.27	.03	.007
507 (fresh sewage)	2	2.35	.46	.087

Tank No.	Days Detention	Total B.O.D.		Suspended B.O.D.	
		Percent Destroyed	Lb. per Cu. Ft. per Yr.	Percent Destroyed	Lb. per Cu. Ft. per Yr.
719	⅓	29	3.08	53	1.71
691	½	23	1.75	50	.94
720	1	33	1.62	48	.37
508	2	45	1.05	60	.27
690	4	52	.56	55	.13
690	6	56	.22	65	.06
507 (fresh sewage)	2	78	2.90	94	2.14

Since generally the main usefulness of septic tanks is in the preparation of sewage for further treatment by removal of suspended matter especially in subsurface disposal areas, the amount of suspended solids remaining in a septic tank effluent is very important. It has been found that the tanks with longer detention show a slightly greater percentage of removal of suspended solids, but Tank No. 719 which had the highest suspended solids remaining showed 67 ppm as against 50 ppm in No. 508. In fixed suspended solids which have a very significant effect on the clogging of subsurface areas, there never has been shown any real difference in the amount remaining.

Subsurface Disposal Areas

Several subsurface disposal fields have been operated continuously at the Station for many years receiving effluents from the septic tanks. Two areas have been operated for nearly 13 years; both are in very fine soil. One unit with sand with an effective size of 0.034 mm has received an average does of nearly 2.5 gallons of septic tank effluent per square foot of trench per day without any great reduction in permeability. The sand in the other unit is slightly coarser, with an effective size of 0.041 mm. Although these units are similarly dosed with the same effluent, and are located in exactly similar locations, this unit has progressively declined in ability to receive effluent from almost 5 gallons per square foot per day to a present figure of less than one gallon. Observation of these units and of larger areas at roadside

stands, etc. indicates the difficulty in estimating the long-time capacity of any given field; but it also seems to be indicated that in well-constructed fields, septic tanks can be dosed at a rate of about one gallon per square foot of trench per day.

Trickling Filters

Over fifty trickling filters have been operated during the past nine years, most of them at high rates. Since study of trickling filters since 1890 has indicated that six feet of stone is the optimum depth for filtration of Lawrence sewage, most of the filters are of this depth, but others have been operated with four, eight, and ten feet of stone. In addition to single-pass filters, many recirculating units have been operated, and several secondary filters, receiving effluents from other units have been run.

The B.O.D. loading has varied from 500 to 700 pounds per acre foot, the typical low-rate loading to a maximum of nearly 20,000 lbs. The accompanying figure shows the B.O.D. removal from all of these filters, together with that of averaged groups of filters receiving approximately the same load. It appears from the results shown that with loadings of 500 to 700 pounds per acre foot, B.O.D. reduction in the settled effluent of about 90% may be expected; that as loadings increase, the reduction in B.O.D. will drop sharply to about 7500 pounds and that with loadings in excess of that figure, comparatively little loss in efficiency will be found.

It has been found that with loadings up to about 1200 pounds per acre foot, considerable quantities of nitrates will be produced, and the effluents will have relative stabilities of 50% or higher, and significant reductions in organic nitrogen will be obtained. From this range up to about 2500 pounds per acre foot some slight degree of nitrification and removal of organic nitrogen will be found, and the effluents will show some degree of relative stability. With loadings beyond this figure there is little or no effect on organic nitrogen and the effluents will remain stable for not much longer than one day. It has been found that with loadings up to about 1500 pounds per acre foot, settled effluents have shown removals in suspended solids on the order of 80% or more from the settled sewage applied. With loadings from about 2000 pounds to 10,000 pounds, the removal of suspended solids has been about 50%, and with heavier loadings the percentage of reduction drops gradually to about 33%, but figures of about that magnitude were still obtained with the maximum loading of nearly 20,000 pounds. Since some reduction of B.O.D. is also obtained with this high loading, it may be assumed that even with this extremely great amount of B.O.D. applied, which was obtained by using a liquid rate of 40 million gallons per acre per day, a trickling filter still gives a considerable degree of treatment.

As far as possible, each of the recirculating filters operated has been paired with a single-pass filter receiving the same B.O.D. loading as that in the primary sewage applied to the recirculator. Several recirculating ratios have been studied, from 1:1 to 9:1, and in general our conclusions have been that a ratio of 3 of recirculated effluent to 1 of new sewage furnishes adequately the dissolved oxygen and high content of active oxidizing bacteria which seem to be the agents responsible for satisactory recirculation performance. A pair of filters operated quite similarly except in recirculation rates showed some slight degree of improvement in reduction of B.O.D. with a ratio or 5:1 as compared to 3:1 but it is questionable if the improvement obtained would warrant the additional pumping cost.

The recirculating filters with primary B.O.D. loads of from 1200 to 9000 pounds per acre foot showed about twice as high a percentage of B.O.D. removal as the single-pass filters with similar loads, and somewhat better performance in removal of suspended solids, but nitrification to any degree and removal of organic nitrogen, as well as reasonably high relative stability was found only in filters with primary loadings of 2500 pounds or less.

Experiments in regard to intermediate settling of recirculated effluent indicated that sedimentation periods as low as 15 minutes were satisfactory. In one experiment the intermediate settling tank was gently agitated by air; the filter for several months seemed to show improved performance, but eventually it began to show deposits of sludge on the top layers of stone, indicating that a complete lack of settling would be unwise.

Secondary single-pass filters which received settled effluents from high-rate recirculating filters gave very satisfactory performance. Two such two-filter units, in one case with the secondary filter operating at 15 million gallons per acre, per day, and the other at 20 million gallons per acre per day, gave overall removals of B.O.D. at times in excess of 85%. The combined loading of such systems was between 3500 and 5000 pounds and the settled effluents of the final filter in each case was as good as those from single-pass filters receiving only one-quarter as great a load.

Secondary sand filters receiving settled effluent from trickling filters also showed very excellent performance. Previous experiments with sand filters indicated that when settled sewage was applied, the maximum rate of application was about 100,000 gallons per acre per day, with a B.O.D. loading not much in excess of 100 pounds per acre. On several units containing 4 feet of sand, it was found possible to obtain effluents low in color and containing 10 ppm or less of B.O.D. with loadings up to 75 pounds per acre foot or a total of as much as 400 pounds per acre. It was found possible also to run these sand filters at loadings 50% greater than the amounts given above for several months before marked deterioration of the effluents was shown.

It was found also that such secondary sand filters gave much more satisfactory results when the effluent applied came from a recirculating filter rather than from a single-pass unit, and that in multiple systems, shallow primary filters were not as satisfactory as those with 6 feet or more of rock.

Industrial Wastes Research

During the period 1941 to 1949 something over 40 different wastes were investigated; in some cases simple sedimentation or coagulation was the only method involved. In many cases however a long study of an individual problem was conducted, including the methods used above and biological treatment as well.

In 1940 work on laundry waste was begun and in 1941 extensive studies on treatment of laundry wastes by coagulation and by trickling filter treatment were carried out. A complete report on this study was made a part of the report of the Division for 1941. It was shown that chemical coagulation of these wastes resulted in a very satisfactory supernatant; the report showed that slow stirring with the addition of acid could neutralize about two-thirds of the total alkalinity of the waste, followed by addition of alum or iron salts which was the most economical and most expeditious manner and that economies in the use of chemicals were thus obtained. Trickling filter studies showed that although the raw laundry waste frequently had a pH as high as 11, direct application to rates up to 1.5 million gallons per acre per day gave very satisfactory removal of B.O.D. and good clarification. With recirculation it was possible to increase this loading somewhat. At rates much higher than this, adequate treatment was obtained for a short while but accumulation of grease and the deleterious effect of the caustic alkalinity on the bacteria of the filter inhibited satisfactory treatment. Filtration of neutralized waste which resulted in removal of the grease made it possible to obtain satisfactory biological treatment with loads at least equal to those given by similar amounts of domestic sewage. Since that time laundry wastes from several other sources including two Army installations have been worked on and it has been found possible by partial treatment to utilize trickling filters for a very satisfactory complete treatment.

In connection with the wastes of one laundry it was found that intermittent discharges of starch into a stream had led to enormous growths of bacteria on the order of at least one billion bacteria per milliliter. It was found possible to coagulate these wastes and to effect almost complete removal of starch.

In several instances wastes from wood working plants were studied; in many cases simple sedimentation was sufficient treatment of these wastes but it was also found that certain materials were extracted from these wastes which later on served as food for bacteria and which also led to very great difficulties from tastes and odors when waters containing these extracts were chlorinated. The studies involved coagulation which was shown to require very high amounts of coagulant for complete treatment, biological filtration which offered a relatively complete answer and also studies of oxidation of the material in the stream, especially by chlorine dioxide which almost completely eliminated the tastes.

Many different kinds of wastes from paper mills were studied. Experiments were conducted both at Lawrence and in the field in regard to the treatment of flax cooking wastes resulting from the manufacture of cigarette paper. It was shown in both experiments that any reasonable amounts of mixture of such wastes with domestic sewage definitely inhibited coagulation and sedimentation. Attempts at chemical coagulation resulted in removal of 50 to 70% of the B.O.D. and a considerable amount of the color but the material remaining was still much too strong to be discharged into any reasonable sized stream. Dilution followed by coagulation especially with calcium chloride gave a high percentage of removal but the cost of this treatment was practically prohibitive. It was found that evaporation of these wastes followed by combustion gave a theoretically satisfactory yield of soda which would probably pay for all or most of the cost of treatment. Later studies on chemical coagulation followed by flotation of light paper mill wastes indicated this method would remove very satisfactorily suspended matter from white water wastes and if certain amounts of coagulant were used, deinking wastes or mixtures of deinking and coagulation wastes could be treated with reasonable certainty of satisfactory improvement. At the present time other investigators are making large scale studies of these processes.

Many different varieties of wastes from chemical plants were studied. Some of these wastes are high in content of both organic and inorganic acids and one waste in particular had a pH as low as 2. Extensive studies on trickling filters showed that this waste after some degree of neutralization responded very satisfactorily to treatment on trickling filters and a large scale pilot plant is now in operation for further confirmation of this study. It was interesting to note that by gradually reducing the pH of the mixed wastes fed to a trickling filter that the filter gradually became accustomed to lower and lower pH's and further studies in regard to trickling filter operation with wastes having a pH as low as 3 are now in operation. A study of wastes containing considerable amounts of zinc indicated that although a trickling filter could be accustomed to amounts of zinc as high as 50 ppm it was generally preferable to remove the zinc wholly or partially before trickling filter operations were used.

Another particularly important study of biological treatment of waste from a chemical plant was conducted in cooperation with engineers from the parent plant. It was found by proper adjustment and gradual building up of proper bacterial growth that it was eventually possible by the use of a trickling filter recirculated with a high ratio to effect satisfactory biological treatment of a waste containing formaldehydes in concentrations up to 1000 ppm.

In a similar fashion, wastes from three different manufactories producing various kinds of plastic wastes showed that trickling filters would operate satisfactorily if gradually accustomed to amounts of phenols and other organic materials up to approximately 100 parts per million although initially these wastes were shown to be quite bactericidal in action. Work on other manufacturing wastes of this type included a study of the effect of cyanides on sand beds and trickling filters and it was found possible by gradually increasing the dose of cyanides to have either type of filter work satisfactorily with doses of cyanides on the order of 50 ppm. It was found that once the growth accomplishing this work was established that removal of the cyanides caused a deterioration in the performance of the filter.

Much field work and a very considerable amount of experimental work was conducted on tannery wastes. In several cases studies were made of specific wastes to determine the probable effect of such wastes when mixed with domestic sewage which was being treated either by sand filters or by trickling filters. It was found that if the proportion of tannery wastes, especially if grease content was high, exceeded 10% of the total that operation of municipal filters received considerable damage. In such cases sedimentation, preferably assisted by coagulation with iron salts or with calcium chloride, sufficiently reduced the B.O.D. and suspended matter and the grease in the wastes so that the effluent of such treatment could then be satisfactorily handled by a normal municipal treatment plant. In three instances, experimental work of this nature at the Station and a subsequent operation of trickling filters receiving the partially or wholly coagulated waste indicated that trickling filters especially with recirculation could satisfactorily handle loadings of tannery

waste up to 1500 pounds per acre foot and that a pH acceptable to the filter might rate as high as 9.0.

Very extensive work was carried on in connection with wool scouring wastes. Very great quantities of these wastes are produced in Massachusetts in many cases on relatively small streams. The wastes are very high in grease and frequently have a B.O.D. as high as 30,000 ppm. For many years various methods of coagulation of these wastes had been studied and in 1947 it was demonstrated that the use of carbon dioxide to neutralize the high caustic alkalinity of the waste followed by or accompanying the use of calcium chloride as a coagulant made it possible to reduce grease content in some cases as much as 99% to effect removal of suspended material well in excess of 90% and to remove all of the suspended B.O.D. as well as small parts of the B.O.D. in solution. Complete reports of this work have been published in scientific journals. Large scale pilot operations have been conducted at several wool scouring plants throughout the State and in one such plant full scale operation is now showing a high degree of success.

In many cases the amount of organic matter and particularly the amount of B.O.D. remaining after even successful coagulation is so high that further treatment is necessary. Dilute trickling filters operated at three different commercial plants and at the Experiment Station have indicated that such filters will operate satisfactorily at loadings in the order of 1200 to 1500 pounds per acre foot and that almost any desired degree of removal of B.O.D. can be obtained. This work is being continued especially with a view to recovery of some or all of the valuable grease content in the wool. Laboratory experiments have shown that this wool grease can be removed in satisfactory condition to the extent of at least 50% of that remaining after treatment by centrifuge and that the wastes remaining after this removal may still be satisfactorily treated by biological means.

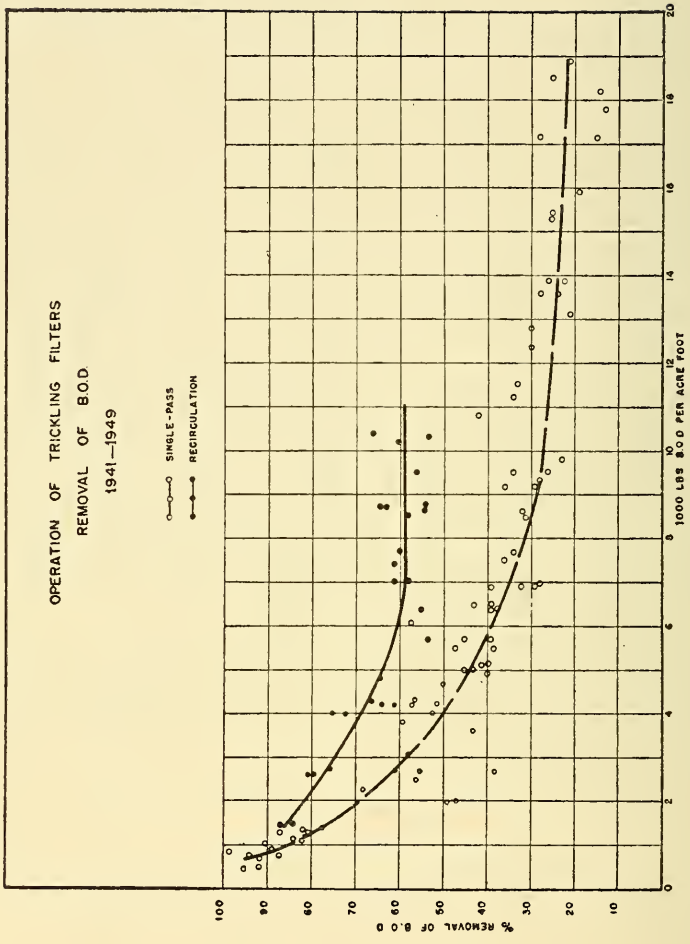
Another important textile waste which has received a considerable amount of attention at Lawrence are the wastes from various dyeing operations. In 1948 and 1949 through the cooperation of several mills, extensive study was made on both acid and alkaline dye wastes and on mixtures of the two. It was found that sedimentation even when assisted by chemical coagulation had relatively little effect on such wastes although it was generally desirable to install equalizer tanks because of the uncertain discharge of volumes and types of wastes particularly with respect to color. It was then shown that trickling filters had B.O.D. loads approximately equal to those giving satisfactory results with domestic sewage produced from satisfactory effluents and that with recirculation filters it was possible to obtain loadings of at least 1500 pounds per acre foot, obtain effluents which show removals of B.O.D. down to 20 or 30 ppm. freedom from suspended solids and complete removal of color. It was shown further that considerable amounts of such dye waste could be treated together with domestic sewage with any of the methods normally employed. These results have also been published in one of the scientific journals.

Other textile wastes receiving attention during the period included several types of cotton bleaching wastes and it was likewise shown that by proper adjustment and especially by fortification of these highly carbonaceous wastes with proper amounts of ammonia and phosphates that successful biological treatment could be obtained. In several individual problems, assistance was given to the manufacturers in obtaining the most effective and most economical methods of coagulation.

Studies were made also of many kinds of wastes resulting from the processing or manufacture of food. Fish wastes almost always involve odorous materials, considerable amounts of grease and fairly heavy B.O.D. loads. Assistance was given to one processor in attempts at biological treatment of mixed wastes from fish handling and the studies indicate that satisfactory treatment could be obtained only with very small loadings. It was also shown that very small amounts of such wastes when mixed with domestic sewage caused considerable difficulties from odors and that relatively small amounts of fish scales clogged and otherwise interfered with machinery for disposing of sewage and waste. In connection with odors from treatment of fish and especially from the manufacture of fish meal, extensive studies on chlorination indicated that in many cases chlorine alone even in very heavy doses did not completely eliminate such odors but that chlorination followed by burning at relatively high temperatures resulted in complete destruction of the odors.

Several different types of waste from distilleries and breweries were studied. In most cases it was found that the most successful preliminary treatment for such wastes was the complete removal of grains by screening, sometimes followed by sedimentation. Following such treatment biological filters were shown to operate with satisfaction provided the pH of the applied wastes was maintained at any given point. It was also shown that considerable amounts of such waste could be mixed with domestic sewage and treated in municipal plants provided that the input of such wastes was maintained at practically the same relative proportion of the mixture; in other words, if these wastes were discharged uniformly over a day, there was little or no interference with satisfactory biological treatment. Several kinds of dairy waste including those from the manufacture of ice cream were also studied. It was found that generally speaking, long storage of waste containing milk or milk products to the point of spasticity gave very satisfactory coagulation and separation of casein and other material and that the supernatant liquor responded well to biological treatment. The treatment of the remaining sludge, however, was rather difficult. At two or three industrial plants, assistance was given in the determination of the most economical method of coagulation and it was found that careful use of iron salts resulted in the production of the smallest amounts of sludge which was relatively stable and handled more easily than the sludge produced by any other coagulant. It was found in general that milk wastes, like many other wastes from food processing could be treated with very limited hope of success in septic tanks and that frequently such treatment gave effluents which were treated with difficulty on sand filters either subsurface or open to the air. Two different types of waste were very difficult to treat because of the high content of inorganic matter and of very stable organic materials. Wastes from potato chip manufacturing were found to contain very high amounts of fine inorganic matter which was very difficult to settle and which unless removed clogged very rapidly sand beds and even coated trickling filters in such a manner as to interfere with successful operation. Corn hulling wastes as ordinarily discharged were found to contain extremely high amounts of inert cellulose which interfered with the operation of septic tanks, sand beds and trickling filters. However, addition of small amounts of coagulant and careful screening resulted in a waste which did respond satisfactorily to biological treatment. Wastes from plants canning citrus fruits were found to be easily treated once the organic acids had been neutralized and the suspended matter removed by screening or careful coagulation. Such wastes after preliminary treatment had no serious effect when mixed with domestic sewage.

In general these experiments indicated that practically every variety of industrial wastes produced in the State could by careful study and especially by careful evaluation of the materials involved be satisfactorily treated and that in many cases interesting methods of biological treatment could be used provided the strength and the other characteristics of the waste were brought into line with similar characteristics of domestic sewage.


OPERATION OF TRICKLING FILTERS
REMOVAL OF B.O.D
1941—1949
SINGLE-PASS
RECIRCULATION
% REMOVAL OF B.O.D
1000 LBS B.O.D PER ACRE FOOT

Purification of Merrimack River Water by Storage and Filtration
Average Chemical Analyses

(Parts per Million)

	Color	Ammonia: Free	Albuminoid: Total	Albuminoid: In Solution	Nitrogen as: Nitrate	Nitrogen as: Nitrite	Oxygen Consumed	Iron	Alkalinity	Hardness	pH
Filter No. 576:											
Raw river water applied	40	.508	.301	.203	.146	.003	8.8	.65	19	27	6.6
Effluent	26	.262	.140	–	.097	.000	6.5	.44	26	29	6.6
Per cent removal	35	48	53	–	–	–	26	32	–	–	–
Filter No. 577:											
Stored river water applied	44	.201	.195	.170	.326	.001	8.5	.47	35	39	7.3
Per cent removal by storage	–	60	35	16	–	–	4	28	–	–	–
Effluent	37	.073	.128	–	.357	.001	7.3	.28	37	43	7.0
Per cent removal from applied	16	64	34	–	–	–	14	40	–	–	–
Per cent removal by storage and filtration	8	86	58	–	–	–	17	57	–	–	–

(Average 1943–1948: 5 years, 3 months operation, representative of whole period 1941–49)

Secondary Sand Filtration of Trickling Filter Effluent
Average Chemical Analyses

Depth, feet	Quantity Applied m. g. a. d.	B.O.D. Applied Lb. per acre—foot	(Parts per Million) Ammonia: Free	Albuminoid: Total	Albuminoid: In Solution	Kjeldahl Nitrogen	Nitrogen as: Nitrate	Nitrogen as: Nitrite	Oxygen Consumed	B.O.D.	Color	Relative Stability
Settled Sewage as Applied to Trickling Filters												
–	–	–	24	4.1	3.0	8.7	–	–	47	255	–	–
Settled Effluent from Trickling Filter No. 704 as Applied to Sand Filter No. 711												
4	10	5,300	–	–	–	5.7	–	–	35	120	–	11
Effluent from Sand Filter No. 711												
4	0.25	63	1.4	0.62	–	–	24.6	.036	9	8	34	99
Per cent Removal from Trickling Filter Effluent												
–	–	–	–	–	–	–	–	–	74	93	–	–
Per cent Removal from Settled Sewage												
–	–	–	94	85	–	–	–	–	81	97	–	–
Settled Effluent from Trickling Filter No. 735 as Applied to Sand Filter No. 712												
6	20	7,100	–	–	–	5.8	–	–	30	109	–	13
Effluent from Sand Filter No. 712												
4	0.25	57	1.1	0.64	–	–	23.9	.027	8	6	39	99
Per cent Removal from Trickling Filter Effluent												
–	–	–	–	–	–	–	–	–	73	95	–	–
Per cent Removal from Settled Sewage												
–	–	–	95	84	–	–	–	–	83	98	–	–
Settled Effluent from Trickling Filter No. 742 as Applied to Sand Filter No. 713												
6	15	5,300	–	–	–	6.4	–	–	38	195	–	11
Effluent from Sand Filter No. 713												
4	0.25	102	0.91	0.53	–	–	24.2	.018	7	7	35	99
Per cent Removal from Trickling Filter Effluent												
–	–	–	–	–	–	–	–	–	82	96	–	–
Per cent Removal from Settled Sewage												
–	–	–	96	87	–	–	–	–	85	97	–	–

(Average 1943–1948, 5 years, 3 months operation, representative of whole period 1941–49)

Average Solids in Samples Collected in Connection with the Lawrence Supply

	(Parts per Million)					
	Dissolved Solids			Suspended Solids		
	Total	Loss on Ignition	Fixed	Total	Loss on Ignition	Fixed
Raw Merrimack River Water	79	29	50	7	4	3
Coagulated and Settled Water as Applied to Filters	75	23	52	–	–	–
Effluent from Filters	107	28	79	–	–	–
Outlet from Distributing Reservoir	92	24	68	–	–	–
Tap at Water Department Shop	92	27	65	–	–	–
Tap at Experiment Station	88	21	67	–	–	

(Average 1943–1948, 5 years, 3 months operation representative of whole period 1941–49.)

Purification of Merrimack River Water by Storage and Filtration
Average Bacterial Analyses

	Bacteria per Milliliter		Coliform Bacteria in 100 ml.
	4 Days 20° C.	24 Hrs. 37° C.	
Filter No. 576:			
Raw river water applied	51,400	1,700	5,300
Effluent	2,700	280	460
Per cent removal	95.0	83.6	91.3
Filter No. 577:			
Stored river water applied	900	110	35
Per cent removal by storage	98.2	93.5	99.3
Effluent	730	15	24
Per cent removal from applied	18.9	86.5	31.4
Per cent removal by storage and filtration	98.6	99.1	99.5

(Average 1943–1948 5 years, 3 months operation—representative of whole period 1941–49)

Average Suspended Solids
(Parts per Million)

	Total	Loss on Ignition	Fixed
Regular Sewage	197	162	35
Settled Sewage	86	70	16
Per cent Removal in Settling	56	57	54
Imhoff Tank No. 545	44	34	10
Per cent Removal by Imhoff Tank	78	79	71

(Average 1943–1948—5 years, 3 months operation—representative of whole period 1941–49)

Septic Tanks — Data on Operation

	719	691	720	508	507	690
Detention period, days	⅓	½	1	2	2	4
Solids in tank, Jan. 1948, lb.	9.9	23.1	13.9	18.5	7.6	15.1
Solids deposited during 1948, lb.	34.4	52.7	21.2	16.7	70.8	17.8
Total solids, lb.	44.3	75.8	35.1	35.2	78.4	32.9
Solids in tank, Jan. 1949, lb.	11.7	25.2	12.6	25.1	11.4	12.5
Solids destroyed, lb.	32.6	50.6	22.5	10.1	67.0	20.4
Solids destroyed, per cent	74	67	64	29	86	62
Solids accumulated, lb.	1.8	2.1	0	6.6	3.8	0
Fats in tank, Jan. 1948, lb.	2.2	5.1	3.4	4.8	2.1	4.0
Fats deposited during 1948, lb.	17.2	26.8	9.7	5.3	18.2	4.8
Total fats, lb.	19.4	31.9	13.1	10.1	20.3	8.8
Fats in tank, Jan. 1949, lb.	2.4	5.1	3.2	5.9	2.1	2.6
Fats destroyed, lb.	17.0	26.8	9.9	4.2	18.2	6.2
Fats destroyed, per cent	87	84	76	42	90	70
Fats accumulated, lb.	0.2	0	0	1.1	0	0
Nitrogen in tank, Jan. 1948, lb.	.35	.74	.48	.52	.24	.49
Nitrogen deposited during 1948, lb.	2.83	3.75	2.06	1.46	3.80	.73
Total nitrogen, lb.	3.18	4.49	2.54	1.98	4.04	1.22
Nitrogen in tank, Jan. 1949, lb.	.37	.75	.44	.76	.48	.38
Nitrogen destroyed, lb.	2.81	3.74	2.10	1.22	3.56	.84
Nitrogen destroyed, per cent	88	83	83	61	88	69
Nitrogen accumulated, lb.	.21	.01	.00	.24	.24	.00

(Average 1943–1948—5 years, 3 months operation—representative of whole period 1941–49)

Operation of Septic Tanks
Biochemical Oxygen Demand

	719	691	720	508	507	690
Detention period, days	⅓	½	1	2	2	4
B.O.D. applied, lb.	246	340	148	87.0	76.0	42.4
B.O.D. destroyed, lb.	56.1	46	40.6	35.5	58.5	22.0
B.O.D. destroyed, per cent	23	13	27	41	77	52
Suspended B.O.D. applied, lb.	41.1	57.0	24.8	14.5	45.4	7.1
Suspended B.O.D. destroyed, lb.	18.0	13.8	8.5	57	42.0	3.6
Suspended B.O.D. destroyed, per cent	44	24	34	39	93	51

(Average 1943–1948—5 years, 3 months operation—representative of whole period 1941–49)

Secondary Sand Filtration of Trickling Filter Effluents
Average Suspended Solids

(Parts per Million)

	Total	Loss on Ignition	Fixed
Sewage applied to Trickling Filters	86	70	16
Settled 704 Effluent as applied to Sand Filter 711	46	39	7
Effluent from Sand Filter 711	11	7	4
Per cent removal from Trickling Filter Effluent	76	–	–
Per cent removal from Settled Sewage	87	–	–
Settled 735 Effluent as applied to Sand Filter 712	47	39	8
Effluent from Sand Filter 712	11	7	4
Per cent removal from Trickling Filter Effluent	77	–	–
Per cent removal from Settled Sewage	87	–	–
Settled 742 Effluent as Applied to Sand Filter 713	58	49	9
Effluent from Sand Filter 713	10	7	3
Per cent removal from Trickling Filter Effluent	83	–	–
Per cent removal from Settled Sewage	88	–	–

(Average 1943–1948, 5 years, 3 months operation representative of whole period 1941–49)

Operation of Septic Tanks
Average Suspended Solids

(Parts per Million)

		Total	Loss on Ignition	Fixed
Tank No. 719 (⅓ day detention)	applied	99	79	20
	effluent	65	49	16
	per cent removal	36	35	20
Tank No. 691 (½ day detention)	applied	99	79	20
	effluent	61	49	12
	per cent removal	38	38	40
Tank No. 720 (1-day detention)	applied	99	79	20
	effluent	64	47	17
	per cent removal	35	40	15
Tank No. 508 (2-days detention)	applied	99	79	20
	effluent	52	37	15
	per cent removal	47	53	25
Tank No. 690 (4-days detention)	applied	99	79	20
	effluent	54	39	15
	per cent removal	45	51	25
	applied	452	377	75
Tank No. 507 (2-days detention)	effluent	44	30	14
	per cent removal	90	92	81

(Average 1943–1948, 5 years, 3 months operation, representative of whole period 1941–49)

Average Chemical Analyses of Samples Collected in Connection with the Lawrence Supply

	(Parts per Million)											
		Ammonia										
			Albuminoid									
	Color	Free	Total	In Solution	Nitrate Nitrogen	Chlorides	Oxygen Consumed	Iron	Manganese	Alkalinity	Hardness	pH
Raw Merrimack River Water	44	.302	.325	.219	.135	7.7	9.2	.46	.058	18	27	6.6
Coagulated and settled water as applied to filters	13	.298	.126	–	.186	8.9	4.8	.21	–	8	33	5.8
Per cent removal	70	1	61	–	–	–	48	54	–	–	–	–
Effluent from filters	9	.291	.107	–	.129	10	3.1	.12	.047	38	50	8.6
Per cent removal	80	3	67	–	–	–	66	74	19	–	–	–
Outlet from Distributing Reservoir	7	.250	.106	–	.156	11	3.0	.11	.038	20	41	7.0
Tap in Water Department Shop	13	.184	.107	–	.179	11	2.9	.33	–	20	41	7.0
Tap at Experiment Station	9	.202	.090	–	.177	11	2.9	.32	.033	20	41	7.01

(Average 1943–1948, 5 years, 3 months operation, representative of whole period 1941–49)

Average Chemical Anlayses

(Parts per Million)									
Ammonia			Kjedlahl Nitrogen						
	Albuminoid								
Free	Total	In Solution	Total	In Solution	Chlorides	Oxygen Consumed	Fats	B.O.D.	pH
Regular Sewage									
35	7.2	4.3	20	13	45	64	52	291	7.3
Settled Sewage									
24	4.1	3.0	8.7	5.9	43	47	38	255	6.8
Per cent Removal by Settling									
31	43	30	57	55	–	27	27	12	–
Sewage after Passing through Imhoff Tank No. 545									
26	2.7	1.9	4.8	3.6	–	28	24	131	7.1
Per cent Removal by Imhoff Tank									
26	63	56	76	72	–	56	54	55	–

(Average 1943–48, 5 years, 3 months operation, representative of whole period 1941–49)

Average Results of Bacterial Analyses of Samples Collected in Connection with the Lawrence Supply

	Bacteria per Milliliter		Per cent of Bacteria Removed		Bacteria
	4 Days 20° C.	24 Hrs. 37° C.	4 Days 20° C.	24 Hrs. 37° C.	In 100 ml.
Raw Merrimack River Water	98,000	6,300	–	–	18,900
Coagulated Water at Mixing Tank, Prechlorinated	33	26	99.9+	99.6	*
Coagulated and Settled Water as applied to Filters	12	6	99.9+	99.9	0
Effluent from Filters	65	4	99.9+	99.9+	*
Effluent after Postchlorination	4	2	99.9+	99.9+	0
Outlet from Distributing Reservoir	300	2	99.7	99.9+	*
Tap on Low Service System	700	4	99.3	99.9+	*
Tap on High Service System	1,000	3	99.0	99.9+	*

*Less than 1

(Average 1943–1948, 5 years, 3 months operation representative of whole period 1941–49)

Operation of Septic Tanks
Average Chemical Analyses

(Parts per Million)

Ammonia				Kjeldahl Nitrogen			Oxygen Consumed	Fats	B.O.D.			pH
	Albuminoid											
Free	Total	In Solution	In Suspension	Total	In Solution	In Suspension			Total	In Solution	In Suspension	
Settled Sewage Applied to Septic Tanks Nos. 719, 691, 720, 508, and 690												
27	5.2	3.7	1.5	9.6	7.2	2.4	55	48	245	204	41	6.8
Effluent from Septic Tank No. 719 (⅓-day detention)												
24	3.8	2.8	1.0	6.8	4.9	1.9	38	34	189	166	23	6.9
Per cent Removal												
11	27	24	67	29	32	21	31	29	23	19	44	–
Effluent from Septic Tank No. 691 (½-day detention)												
22	3.8	2.8	1.0	6.9	5.2	1.7	39	28	212	181	31	6.8
Per cent Removal												
19	27	24	33	28	28	29	29	42	13	11	24	–
Effluent from Septic Tank No. 720 (1-day detention)												
25	3.4	2.5	0.9	6.2	4.6	1.6	35	32	178	151	27	6.9
Per cent Removal												
7	35	33	40	36	39	33	36	33	27	26	34	–
Effluent from Septic Tank No. 508 (2-days detention)												
27	3.0	2.3	0.7	5.5	4.3	1.2	30	33	145	120	25	7.0
Per cent Removal												
0	42	38	57	43	40	50	36	31	41	42	39	–
Effluent from Septic Tank No. 690 (4-days detention)												
25	3.0	2.0	1.0	5.4	3.8	1.6	28	20	118	97	21	7.1
Per cent Removal												
7	42	46	33	44	47	33	50	58	52	53	49	–
Fresh Sewage Applied to Septic Tank No. 507												
45	15	6.4	8.6	27	12	15	161	125	439	177	262	7.1
Effluent from Septic Tank No. 507 (2-days detention)												
40	2.8	2.0	0.8	5.1	3.7	1.4	29	20	101	82	19	6.8
Per cent Removal												
11	81	69	91	82	69	91	82	84	77	54	93	

(Average 1943–1948, 5 years, 3 months operation, representative of whole period 1941–49)

Operation of Trickling Filters — Average Chemical Analyses

Filter No.	Depth, feet	Quantity Applied m. g. a. d.	B.O.D. Applied Lb. per acre—foot	(Parts per Million)													Relative Stability
				Kjeldahl Nitrogen	Oxygen Consumed	Nitrogen as		B.O.D.		Suspended Solids							
										Unsettled			Settled				
						Nitrate	Nitrite	Unsettled	Settled	Total	Loss on Ignition	Fixed	Total	Loss on Ignition	Fixed		
Settled Sewage		–	–	8.7	47	–	–	255	–	86	70	16	–	–	–		–
715	6	40	14,200	6.3	36	–	–	189	172	71	58	13	51	43	8		11
Per cent Removal (from settled sewage)			–	28	23	–	–	26	33	17	17	–	41	39	–		–
714	6	30	10,600	6.2	36	–	–	183	162	70	58	12	50	42	8		11
Per cent Removal			–	29	23	–	–	28	36	19	17	–	42	40	–		–
735	6	20	7,100	5.8	30	–	–	123	109	65	53	12	47	39	8		13
Per cent Removal			–	33	36	–	–	52	58	24	24	–	45	44	–		–
736	6	20	7,100	5.2	28	–	–	112	97	61	50	11	44	37	7		15
Per cent Removal			–	40	40	–	–	56	62	29	29	–	49	47	–		–
742	6	15	5,300	6.4	38	–	–	216	195	73	59	14	58	49	9		11
Per cent Removal			–	26	19	–	–	15	24	15	16	–	32	30	–		–
704	4	10	5,300	5.7	35	–	–	166	149	62	49	13	46	39	7		11
Per cent Removal			–	35	25	–	–	35	42	27	30	–	47	44	–		–
740	6	6	2,100	6.2	32	.413	.103	146	120	91	73	18	54	44	10		15
Per cent Removal			–	29	32	–	–	43	53	0	0	–	37	37	–		–
738	6	6	2,100	5.1	27	.446	.163	87	71	59	47	12	44	36	8		21
Per cent Removal			–	41	43	–	–	66	72	31	33	–	49	49	–		–
739	6	6	2,100	5.0	25	.573	.151	83	64	67	52	15	40	32	8		27
Per cent Removal			–	43	48	–	–	68	75	22	26	–	54	54	–		–
730	3	6	1,100	4.3	21	2.76	.125	59	50	46	35	11	28	23	5		55
Per cent Removal			–	51	55	–	–	77	80	47	50	–	68	67	–		–
737	6	20*	2,700	4.6	25	.758	.162	70	58	52	41	11	36	29	7		34
Per cent Removal			–	47	48	–	–	73	78	40	41	–	58	59	–		–
741	4	6*	1,800	5.4	26	.873	.148	109	71	104	78	26	45	36	9		28
Per cent Removal			–	38	45	–	–	57	72	0	0	–	48	49	–		–
Recirculated effluents mixed with settled sewage as applied to recirculating filters:																	
735	–	–	–	7.2	35	–	–	157	–	60	49	11	–	–	–		–
Per cent Removal			–	17	26	–	–	38	–	30	30	–	–	–	–		–
736	–	–	–	7.0	34	–	–	166	–	63	51	12	–	–	–		–
Per cent Removal			–	20	28	–	–	35	–	27	27	–	–	–	–		–
738	–	–	–	6.2	31	–	–	116	–	54	43	11	–	–	–		–
Per cent Removal			–	29	34	–	–	55	–	37	38	–	–	–	–		–
739	–	–	–	5.9	29	–	–	108	–	58	46	12	–	–	–		–
Per cent Removal			–	32	38	–	–	58	–	33	34	–	–	–	–		–

*Secondary Filters:
No. 737 receives settled effluent from No. 736
No. 741 receives unsettled effluent from No. 740

(Average 1943–1948 5 years, 3 months operation representative of whole period 1941–1949)

AMHERST LABORATORY REPORT

The laboratory for the western district was located at the Westfield State Sanatorium in 1941. In December 1942, this laboratory was moved to the University of Massachusetts at Amherst. This facilitated cooperative arrangements with the University of Massachusetts by members of the laboratory staff. At first, only special chemical, microscopical and bacterial examinations were analyzed and examined at this laboratory, but after September 1944 all the regular monthly bacterial examinations of samples submitted from water departments in the two western districts have been sent to the Amherst laboratory instead of to the Lawrence Experiment Station.

The work of cooperation with the University of Massachusetts has consisted of student instruction by lectures and by laboratory instruction of students. In the last fiscal year the lectures have consisted of about 40 hours; laboratory instruction 159 hours; and 7 hours have been devoted to examinations.

The following numbers and types of samples were analyzed at the Westfield or Amherst laboratory during the period from January 1, 1941, to June 30, 1949:

Calendar Year	Bacterial Samples	Chemical Samples	Microscopic Samples	Special Examinations
1941	2692	135	245	13
1942	1702	113	249	8
1943	730	153	58	83
1944	1132	322	57	22
1945	2011	344	26	245
January–June, Inclusive, 1946	808	195	6	159
Fiscal Years Ending				
June 30, 1947	1708	331	12	196
June 30, 1948	1759	607	2	284
June 30, 1949	1811	552	34	65

Public Document No. 34

The Commonwealth of Massachusetts

CONSOLIDATED REPORT

OF THE

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FOR THE

FISCAL YEARS 1950 THROUGH 1956

VOLUME I

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PUBLICATION OF THIS DOCUMENT APPROVED BY GEORGE J. CRONIN, STATE PURCHASING AGENT
1M-6-57-920570

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MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

July 1, 1956

Commissioner of Public Health, Samuel B. Kirkwood, M.D.

Public Health Council

Samuel B. Kirkwood, M.D., *Chairman*

Gordon M. Fair, B.S., Dr. Ing., 1956–62
William H. Griffin, D.M.D., 1945–57
Paul J. Jakmauh, M.D., 1949–61
Raymond L. Mutter, 1947–59
Conrad Wesselhoeft, M.D., 1953–60
Charles F. Wilinsky, M.D., 1946–58

Florence L. Wall, *Secretary*

Bureau of Administration

Leon A. Bradley, Ph.D., *Bureau Chief*

Division of Administration	Leon A. Bradley, Ph.D., *Director*
Division of Health Information	Louis Cohen, M.D., Dr.P.H., *Director*

Bureau of Health Services

Robert E. Archibald, M.D., M.P.H., *Bureau Chief*

Division of Local Health Services	Robert E. Archibald, M.D., M.P.H., *Director and Deputy Commissioner*
Division of Maternal and Child Health Services	R. Gerald Rice, M.D., M.P.H., *Director*

Bureau of Hospital Facilities

A. Daniel Rubenstein, M.D., M.P.H., *Bureau Chief*

Division of Hospital Facilities	A. Daniel Rubenstein, M.D., M.P.H., *Director*

Bureau of Preventive Disease Control

Herbert L. Lombard, M.D., M.P.H., *Bureau Chief*

Division of Cancer and Chronic Disease	Herbert L. Lombard, M.D., M.P.H., *Director*
Division of Communicable Diseases	Roy F. Feemster, M.D., Dr.P.H., *Director*
Division of Venereal Diseases	Nicholas J. Fiumara, M.D., M.P.H., *Director*
Division of Dental Health	William D. Wellock, D.M.D., M.P.H., *Director*
Division of Alcoholism	James B. Maloney, M.D., *Director*

Bureau of Environmental Sanitation

Clarence I. Sterling, Jr., C.E., *Bureau Chief*

Division of Sanitary Engineering	Clarence I. Sterling, Jr., C.E., *Director*
Division of Food and Drugs	George A. Michael, *Director*

Bureau of Tuberculosis Control

William H. Weidman, M.D., *Bureau Chief*

Division of Sanatoria and Tuberculosis	William H. Weidman, M.D., *Director*

Bureau of Institute of Laboratories

JOHANNES IPSEN, M.D., M.P.H., *Bureau Chief*

Division of Biologic Laboratories JAMES A. MCCOMB, D.V.M., *Director*

Division of Diagnostic Laboratories ROBERT A. MACCREADY, M.D., *Director*

District Health Officers under Division of Local Health Services

Southeastern District . . .	GRACE E. LUTMAN, M.D.
Lakeville State Sanatorium Middleboro	
Northeastern District . . .	FREDERICK A. DUNHAM, M.D.
North Reading State Sanatorium North Wilmington	
Central District	ARTHUR E. BURKE, M.D.
Rutland State Sanatorium Rutland	
Western District	WALTER W. LEE, M.D.
University of Massachusetts Amherst and 246 North Street, Pittsfield	

Institutions under Division of Sanatoria and Tuberculosis

Lakeville State Sanatorium .	HARRY A. CLARK, M.D., *Superintendent*
North Reading State Sanatorium	CLAIR W. TWINAM, M.D., *Superintendent*
Rutland State Sanatorium . .	PAUL DUFAULT, M.D., *Superintendent*
Westfield State Sanatorium .	WILSON W. KNOWLTON, M.D., M.P.H., *Supt.*
Pondville Hospital . . .	GEORGE L. PARKER, M.D., *Superintendent*
Lemuel Shattuck Hospital . .	WILLIAM H. H. TURVILLE, M.D., *Supt.*
Massachusetts Hospital School .	JOHN J. CARROLL, M.D., *Superintendent*

The Commonwealth of Massachusetts

CONSOLIDATED REPORT

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DEPARTMENT OF PUBLIC HEALTH

for the

FISCAL YEARS 1950 THROUGH 1956

REPORT OF THE PUBLIC HEALTH COUNCIL

Personnel

On July 1, 1949, the Public Health Council was constituted as follows:

William H. Griffin, D.M.D., Boston
Gordon Hutchins, Concord
Paul J. Jakmauh, M.D., Milton
Francis H. Lally, M.D., Milford
Raymond L. Mutter, Holyoke
Charles F. Wilinsky, M.D., Brookline

It is with deep regret that we record the death on August 4, 1953, of Dr. Francis H. Lally, who served the Commonwealth faithfully as a member of the Public Health Council since 1924. At a meeting on August 25, 1953, the Council adopted the following resolution expressing the loss to the Department in Dr. Lally's death:

In Memoriam

Whereas, God in His Infinite Wisdom has called from our midst to his eternal rest our good friend for many years and fellow member of the Public Health Council, Francis H. Lally, M.D., and

Whereas, his friends and associates feel a deep sense of personal loss in the death of one who did so much to help further the health and welfare of the people of the Commonwealth by his service on the Public Health Council for twenty-nine years, and

Whereas, in our many contacts with him we were privileged to have an insight into his qualities of tact, integrity, and devotion to high ideals, and

Whereas, he gave of himself and his time unselfishly and willingly in order that the people of this Commonwealth might benefit from his wisdom;

Therefore, Be It Resolved: That this expression of great loss be written on the records of the Department of Public Health in the minutes of August 25, 1953, and that a copy of this resolution as well as a message of deep sympathy be forwarded to his family.

Dr. Conrad Wesselhoeft of Boston was appointed in December, 1953, to fill Dr. Lally's unexpired term, and in May, 1954 Dr. Wesselhoeft was reappointed for a complete six-year term.

Dr. Griffin, Dr. Wilinsky, Mr. Mutter, and Dr. Jakmauh were reappointed for six-year terms in 1951, 1952, 1953, and 1955, respectively.

In May, 1950 Mr. Paul F. Flaherty of Boston was appointed as a member of the Public Health Council in place of Mr. Gordon Hutchins, whose term had expired. Professor Gordon M. Fair of Cambridge was appointed in May, 1956 in place of Mr. Flaherty, whose term expired.

Under General Laws, Chapter 17, Section 3, the Commissioner of Public Health is ex officio a member of the Public Health Council and serves as Chairman.

In February, 1956 Miss Florence L. Wall completed twenty years' service as Secretary to the Public Health Council. Miss Wall continues in her position, but in view of the distinction of having served in this capacity under four commissioners the Public Health Council at its meeting on February 14, 1956 gave suitable recognition to this service.

On June 30, 1956 the membership of the Public Health Council was as follows:

William H. Griffin, D.M.D., Boston, 1945–57
Charles F. Wilinsky, M.D., Brookline, 1946–58
Raymond L. Mutter, Holyoke, 1947–59
Conrad Wesselhoeft, M.D., Boston, 1953–60
Paul J. Jakmauh, M.D., Milton, 1949–61
Gordon M. Fair, B.S., Dr. Ing., Cambridge, 1956–62

Meetings

Regular monthly meetings of the Public Health Council were held in accordance with General Laws, Chapter 17, Section 3, usually at the State House, Boston. Some meetings were held at the institutions under the jurisdiction of the Department. Such visits are planned in rotation, so that each institution is visited about once every three years. This practice allows the Council members to familiarize themselves with the individual programs of each hospital and to inspect the physical facilities for the care of the patients and for maintenance and housekeeping. During the period of this report, Council meetings were held at North Reading State Sanatorium in 1949 and 1952; at Lakeville State Sanatorium in 1950, 1952 and 1953; at Westfield State Sanatorium in 1950, 1952, and 1953; at Rutland State Sanatorium in 1952; at Pondville Hospital in 1951 and 1954; at Lemuel Shattuck Hospital in 1955; and at Massachusetts Hospital School in 1956. When visiting the institutions, the Council gave particular attention to preparations for civil defense, including facilities for storage of litters, auxiliary pumps, generators and other supplies, and emergency accommodations should an evacuation of patients and staff become necessary.

In addition to its regular monthly meetings, it was necessary for the Council to meet to hold public hearings, to meet jointly with the State Advisory Council on the Administration of the Hospital and Medical Facilities Survey and Construction Act, or to consider new activities and responsibilities added to the Department from time to time, usually by legislative act. A special meeting was held in March, 1953 to join with the Special Commission on the Structure of State Government in a public hearing to consider the recommendations of that Commission relative to the Department of Public Health.

Because of the desire of the Council members to become as familiar as possible with all public health activities in the Commonwealth, the Council continued the practice established several years ago of holding certain meetings each year in sections of the State away from Boston to consult with local health officials or to view public health installations of various kinds.

In July, 1949 conferences were held with the County Commissioners of Nantucket, who also constitute the Board of Selectmen and Board of Health. Matters of sanitation, a proposed regulation for pasteurized milk, and the conduct of immunization clinics were discussed. Inspections were made of the privately owned and municipally owned water supply systems and sewage disposal works. Five years later, in September, 1954, the Council again met at Nantucket with the Board, and discussed particularly the polio situation at Nantucket, programs for vaccination and inoculation of school children, sanitation, and food handling. With the Hospital Trustees and Superintendent the present buildings housing the Nantucket Cottage Hospital were inspected, and the site of the proposed hospital was viewed.

In Barnstable County in July, 1950 the County Health Officer met with the Public Health Council to discuss his local problems, and with him the Council viewed public health facilities, including sanitation and food handling at the National

Guard Encampment at Wellfleet, and the water supply of Provincetown. A meeting was held at the Cape Cod Hospital at Hyannis and on the following day at Barnstable County Sanatorium at Pocasset.

In August, 1950, in cooperation with the Division of Marine Fisheries, an inspection was made of the sewer outlets and sources of pollution along the north shore of Massachusetts. The Council met again in Gloucester in August, 1953 and inspected the site of the new Putnamville Reservoir of the Salem-Beverly water supply and the water filtration plant on Wenham Lake.

In Franklin, Berkshire, and northern Worcester Counties in June, 1951, inspections were made of the sanitary condition of the Westfield, Housatonic, and Millers rivers, the Pittsfield water supply, and the Lee sewage treatment works. Conferences were held with the Mayor of Pittsfield, the Commissioner of Public Works of Pittsfield, and officials of the Athol Hospital. An inspection was made of the new municipal incinerator at Pittsfield, one of the most effectively operated in this section of the country. The source of water supply for the town of Bernardston, a dug well, a most unusual source of town water supply, was visited.

In July, 1951 the Council met at the Woods Hole Oceanographic Institute, where members of the scientific staff explained their studies on shellfish and other forms of marine life; on Martha's Vineyard the Council inspected certain shores to observe the effects of certain tidal conditions, and held conferences with representatives of the Board of Selectmen.

At the invitation of Dr. Charles F. Wilinsky, a member of the Public Health Council and Executive Director of Beth Israel Hospital, Boston, the Council held its March, 1951 meeting at that hospital. Under Dr. Wilinsky's guidance the Council visited various departments of the hospital, inspected the facilities for in-patient and out-patient care, and viewed the work being done at the new Yamins Research Memorial Laboratory for surgical research.

On September 28, 1955, at the invitation of Dr. Kenneth I. E. Macleod, Director, Nashoba Associated Boards of Health, the Council met in the towns of Ayer and Harvard in connection with the observance of the twenty-fifth anniversary of this association. Representatives of several of the sixteen towns included in the district attended the meetings. The general programs of the Associated Boards, special programs of the individual communities, and a general outline of the history of the Associated Boards of Health were discussed.

At the Lawrence Experiment Station in June, 1956 a meeting was held for a two-fold purpose: to hold a hearing on the revocation of a hospital license, and to provide an opportunity for the Council to inspect various aspects of the work done by the Department at the Lawrence Experiment Station on the chemical and bacteriological analyses of water, tests on sewage and industrial wastes, air pollution, radioactivity, etc.

Annually, in June, meetings of the Public Health Council were held at Amherst coincidentally with the Amherst Health Conference.

The Committee on Environmental Sanitation, composed of Dr. Jakmauh, Chairman, Mr. Mutter, and the Commissioner, has met regularly prior to the regular Council meetings to study matters of sanitary significance and to prepare recommendations on them for presentation to the full meeting of the Council.

General Duties

The regular duties imposed upon the Council by General Laws, Chapter 111, Section 3, and other statutes have been carried out. These include the following: the approval and licensing of hospitals, hospital blood banks, convalescent and nursing homes, boarding homes for the aged, public medical institutions, city and town infirmaries, dispensaries, and dental clinics which comply with the Department's minimum standards; the certification of laboratories which have taken part in the annual evaluations carried on by the Department's Institute of Laboratories and have demonstrated their ability to perform satisfactorily the tests listed; approval of changes in health district boundaries; approval of the creation of new divisions or changes in title of existing divisions within the Department; approval of

professional personnel in the Department and at State and county sanatoria; approval of contracts between medical milk commissions and dairies for the production and sale of certified milk; approval of food regulations of local communities which submit them for approval under General Laws, Chapter 94, Section 146; advice to cities and towns and official agencies on sanitary problems of water supply, sewage disposal, nuisances and offensive trades, and prevention of pollution of inland and tidal waters; approval of out-of-state shellfish dealers who have been approved by their respective state shellfish authorities and certified by the Public Health Service; and contracts between the Commonwealth and municipalities and between two or more counties or municipalities for the care of tuberculosis patients.

Hearings

Public hearings required by statute were held by the Council on the following matters: appeals from owners of hospitals or nursing homes from refusals of State or local authorities to grant necessary approvals; appeals of owners of dairies from refusals of local boards of health or inspectors to issue licenses or permits to sell milk; and on regulations before approval.

In addition, under authority of Chapter 152 of the Acts of 1946, certain division directors have been authorized by the Council to hold certain public hearings. The Directors of Sanitary Engineering, of Food and Drugs, and of Hospital Facilities have been so designated from time to time. The information presented at these hearings was submitted to subsequent meetings of the Public Health Council for action. This method has eliminated the necessity of holding a good many extra Council meetings, with a consequent saving in time to the Council members and in expense to the Commonwealth.

Hospital Survey and Construction

Applications from hospitals for financial assistance from Federal funds allotted to the Commonwealth by the Surgeon General under the Federal Hospital and Medical Facilities Survey and Construction Act, after approval by the State Advisory Council, have been considered periodically. During this seven-year period allocations of Federal funds have been granted to about 70 hospitals for new buildings, alterations, additions, or equipment.

Annually the revision of the Massachusetts State Plan for the administration of this act has been studied and approved.

Regulations

Rules and regulations relative to the following matters have been approved and adopted:

Bakeries and bakery products
Purity and quality of food
Pasteurized milk and establishments for the pasteurization of milk
Milk and egg products
Protection of dietetic foods
Licensing of hospitals and sanatoria
Use of blood or other tissue for purposes of transfusion
Distribution of biologic products
Sale of surplus biologic products
Isolation and quarantine requirements
Physical examination of school children
Issuance of premarital medical certificates
Cancer clinics
Minimum housing rules and regulations
Cross connections between public water supplies and fire or industrial water supplies.

In accordance with Chapter 576 of the Acts of 1951, which requires that a public hearing be held relative to rules and regulations which contain a penalty clause or are made under a statute containing such a clause, wherever applicable such a public hearing was held prior to the adoption of regulations.

A complete list of rules and regulations adopted by the Department since 1914 and still in effect is included under the report of the Commissioner of Public Health.

REPORT OF THE COMMISSIONER OF PUBLIC HEALTH

Office of the Commissioner

After several years with the Department in various positions, the last ten as Commissioner of Public Health, Dr. Vlado A. Getting left the Department in May, 1953 to accept a position as Professor of Public Health Practice at the University of Michigan and as Consultant to the Detroit Health Department. The ten years of his commissionership in Massachusetts covered a period of changing public health practices. Dr. Getting not only made valuable contribution to progress in this field within Massachusetts, but distinguished himself as one of the outstanding state health officers of the country, and became a recognized leader in public health.

Dr. Samuel B. Kirkwood was appointed to the position of Commissioner of Public Health and assumed the duties of this position on May 8, 1953.

Dr. Alton S. Pope retired from the Department on September 30, 1954, after serving for more than twenty-five years as Director of Tuberculosis and Sanatoria. During the last seventeen of these years he was also Deputy Commissioner. I should like to record the sincere and deep thanks of the Department for Dr. Pope's long and faithful service in the field of public health.

Reorganization of the Department

Early in 1949 the Department was reorganized by grouping all divisions and sections into four bureaus, each bureau chief to assume responsibility for a specific segment of the Department's functions, and to be directly responsible to the Commissioner. These bureaus were Environmental Sanitation, Preventive Medicine, Tuberculosis and Sanatoria, and Administration.

After considerable study based on experience under the above organization it was found advisable to enlarge the number of bureaus within the Department from four to seven to permit a better grouping of functions and distribution of executive responsibility. This plan of reorganization was approved by the Public Health Council on April 12, 1955 and was put into effect at the beginning of the 1956 fiscal year, July 1, 1955. At the present time the Department is functioning through these seven bureaus:

- Bureau of Administration
  - Commissioner's Office
  - Division of Administration
    - Fiscal Section
    - Personnel Section
    - Legal Section
  - Division of Training and Research
  - Division of Health Information
- Bureau of Environmental Sanitation
  - Division of Sanitary Engineering
  - Division of Food and Drugs
- Bureau of Preventive Disease Control
  - Division of Cancer and Chronic Disease
  - Division of Communicable Diseases
  - Division of Dental Health
  - Division of Alcoholism
- Bureau of Health Services
  - Division of Local Health Services
    - District Health Offices
    - Civil Defense
    - Nursing
    - Social Work
    - Nutrition
    - Division of Maternal and Child Health Services
- Bureau of Hospital Facilities
  - Division of Hospital Facilities

Bureau of Tuberculosis and Institutions
Division of Sanatoria and Tuberculosis
Bureau of Institute of Laboratories
Division of Biologic Laboratories
Division of Diagnostic Laboratories

The Division of Administration, the first division to be created within the Department, on December 14, 1915, had been under the direct supervision of the Commissioner until the creation of the position of Director of Administration, which was filled by Leon A. Bradley, PhD. on February 8, 1955 to relieve the Commissioner of certain details and routine.

Staff Conferences

Regular conferences have been held by the Commissioner with his bureau chiefs every Monday morning. On the first Monday of each month all division directors participated in these conferences, and on the first Monday of each quarter the meetings included also district health officers, institution superintendents, and section heads.

Department staff meetings have been held either annually or semiannually and have included as many members of the entire Department staff as possible.

Department Headquarters

The need for increased and unified headquarters for the Department has remained a serious problem. During the past few years the Department has expanded greatly, and the number and complexity of programs have increased, resulting in a demand for more personnel and an increase in the duties of existing personnel. These added responsibilities have intensified the already critical housing condition of the Department. Additional quarters are urgently needed, either by renting or constructing a suitable building. At present, Department offices, exclusive of the laboratories, are scattered in six different buildings in Metropolitan Boston outside the State House. Nowhere in the present quarters are there adequate and safe storage facilities for the vital permanent records of the Department. The overcrowded and scattered offices do not permit residents of the Commonwealth, physicians, members of local boards of health, or members of the General Court to find personnel readily for conference or advice on specific public health matters. Adequate space in a single building would save money, utilize personnel more effectively, and permit more efficient and adequate service.

In 1950 and 1951 partial consolidation of the Department's laboratories was accomplished by uniting the laboratories in Jamaica Plain into the Institute of Laboratories. Efforts are being made to provide additional laboratory buildings at this site. In 1954, the Water and Sewage Laboratories, which were located on the fifth floor of the State House for many years, were transferred to the new building housing the Lawrence Experiment Station, so that the bacteriological and microscopical analyses are now performed under the same roof as the chemical analyses.

Approving Authority for Medical Schools

The Approving Authority for Medical Schools, consisting of the Secretary of the Board of Registration in Medicine, the Commissioner of Public Health, an osteopathic member of the Board of Registration, and a layman, determines those medical schools whose graduates may become candidates for registration in the practice of medicine in Massachusetts. After hearings by the Approving Authority the following schools were approved during the period of this report:

Southwestern Medical School
Chicago Medical School
University of Toronto
Stritch College of Medicine of Loyola University
University of Georgia Medical School
Dalhousie Medical School of Nova Scotia
Trinity College School of Physic, Dublin

Bowman Gray School of Medicine, Lake Forest College, Winston-Salem, North Carolina
University of Montreal
Kansas City College of Osteopathy and Surgery
University of London
University College, Dublin
University College, Galway
University College, Cork
University of Oxford, England
Cambridge University, England
University of Zurich, Switzerland
University of Basle, Switzerland
American University of Beirut
University of Copenhagen
Chicago College of Osteopathy

Chapter 759 of the Acts of 1955, entitled An Act Relative to Schools for the Training of Medical Laboratory Technologists, provided for three additional members of the Approving Authority to act for the purposes of Chapter 759 only. These three additional members include a hospital administrator or trustee and member of the Massachusetts Hospital Association, an adequately trained and experienced laboratory technologist, and a physician appointed from a list submitted by the Section of Physiology and Pathology of the Massachusetts Medical Society.

Medical Panels

General Laws, Chapter 32, Section 6, as amended, directs the Commissioner of Public Health to appoint chairmen of medical panels to review applications and examine State and municipal employees applying for disability retirement. The chairman, insofar as possible, must be a physician skilled in the particular branch of medicine or surgery involved in the case; the other two members of the panel are selected by the applicant and by the local retiring authority. By direction of Chapter 181 of the Acts of 1952, all three members of the medical panel must conduct the examination in the presence of each other, but their findings are arrived at independently of one another. Since 1951 the number of applications processed by the Department each year has averaged 825.

In addition to medical panels for applicants for disability retirement, upon application by the widow of a fireman or policeman for an annuity the Department under General Laws, Chapter 32, Section 89 designates the third member of a board to determine whether or not the death of said fireman or policeman was the result of an injury received in the performance of his duty. Such requests average from 40 to 50 per year.

Rating Board

As Chairman of the Rating Board, created by General Laws, Chapter 32, Section 6, the Commissioner presided at hearings and interviewed applicants from the uniformed branch of the State Police applying for retirement because of illness or injury received in line of duty. After examination of the applicants and review of their records, recommendations relative to retirement were made by the Board. The annual average number of such applications was about seven.

Building and boiler inspectors of the Department of Public Safety and State Police detective lieutenants upon reaching the age of 55 or completing 20 years of service must have an annual physical examination to determine their fitness to continue working to the compulsory retirement age of 65. In this group about nine were annually examined by the Rating Board.

Milk Regulation Board

The Milk Regulation Board, consisting of the Chairman of the Milk Control Board, the Commissioner of Agriculture, the Attorney General, and the Commis-

sioner of Public Health, has held several meetings each year, attended by the Commissioner of Public Health or the Director of the Food and Drugs Division as his representative.

Council for the Aging

The Council for the Aging was created by Chapter 591 of the Acts of 1955 and consists of the Commissioners of Education, Mental Health, Public Health, Public Welfare, and Labor and Industries, and four members appointed by the Governor. This council acts in an advisory and consultative capacity, with the general objective of coordinating the several State departments' programs designed to meet the problems of the aging and also to assist and coordinate such activities at community levels.

State Planning Board

During the early part of the period covered by this report the Department was represented at all regular meetings of the State Planning Board by the Commissioner or by a member of the Division of Sanitary Engineering. The final meeting of this board was held on April 30, 1953, when the State Planning Board was abolished and its powers and duties were transferred to the Division of Planning of the newly created Department of Commerce.

The activities of this board of greatest interest to the Department of Public Health were:

(1) The study relating to development of improved recreational facilities at ocean beaches.

(2) The work under Chapter 134 of the Acts of 1952, requiring that local boards of health approve all real estate subdivisions before final approval by the local planning board, aimed at eliminating the difficulties which have occurred in real estate developments where no sewerage facilities exist and where subsoil conditions are unsuitable for local sewage disposal.

(3) A complete aerial survey of the Commonwealth, including maps of critical target areas for Civil Defense activities.

(4) Maps of primary and secondary roads, population densities, critical target areas, and casualty centers, prepared for the State Civil Defense Agency.

(5) A study by engineers of the Planning Board of all inland bathing beaches in the Commonwealth.

Regulations

The following rules and regulations have been promulgated by the Department and are still in effect:

Distribution of biologic products
Adopted 4/9/35; amended 5/14/40; 1/11/49; 12/15/53

Sale of surplus biologic products
Adopted 4/12/49; amended 12/15/53

Use of blood or other tissues for purposes of transfusion
Adopted 1/10/39; amended 4/10/39; 10/7/41; 11/4/41; 9/14/48; 3/11/52; 6/12/56

Cancer clinics and service unit values
Adopted 8/10/26; amended 6/14/27; 3/13/28; 1/5/35; 9/14/43; 10/5/43; 11/11/43; 12/14/43; 4/11/44; 1/14/47; 10/18/55

List of diseases dangerous to public health
Adopted 1907; amended 12/15/14; 12/14/15; 2/16/17; 4/3/17; 12/18/17; 10/29/18; 11/18/20; 12/8/21; 9/18/28; 6/11/35; 12/10/35; 11/10/36; 2/14/39; 5/1/41; 5/12/42; 4/14/43; 10/5/43; 12/14/43; 1/11/44; 11/3/48

Diseases declared to be dangerous to the public health and reportable
Adopted 1907; amended 12/15/14; 12/14/15; 2/16/17; 4/3/17; 12/18/17; 10/29/18; 11/18/20; 12/8/21; 9/18/28; 6/11/35; 12/10/35; 11/10/36; 2/14/39; 5/1/41; 5/12/42; 4/14/43; 10/5/43; 12/14/43; 1/11/44; 11/3/48

Isolation and quarantine requirements of diseases declared to be dangerous to public health
Adopted 8/9/38; amended 5/13/41; 1/11/44; 11/3/48; 8/12/52

Transportation of bodies dead of diseases dangerous to public health
Adopted 7/12/38; amended 8/9/38; 2/14/39

Funerals of persons dead of any disease dangerous to public health
Adopted 8/9/38; amended 5/13/41; 1/11/44

Cremation
Adopted 12/5/07; amended 10/29/18

Treatment of persons exposed to rabies
Adopted 8/10/37; amended 5/13/41

Approval of bacteriological and serological laboratories
Adopted 9/12/39

Use of a common drinking cup
Adopted 3/22/16

Use and concerning the providing of a common towel
Adopted 12/16/15; amended 3/22/16

Approval of lodging houses
Adopted 7/6/05

Barbering and barber shops
Approved 12/6/49

Cross connections between public water supplies and fire and industrial water supplies
Adopted 2/9/37; amended 5/12/42; 10/9/51

To prevent pollution or contamination of any or all of the lakes, ponds, streams, tidal waters, and flats within the Commonwealth or of the tributaries of such tidal waters and flats
Adopted 8/14/45; amended 10/14/45

Supervision of plumbing
Adopted 6/11/35; amended 8/6/40; 1/10/50; 5/8/56

Minimum standards of fitness for dwellings
Adopted 12/6/49; 3/8/55

Operation of plants for the purification of shellfish
Adopted 6/5/28; amended 10/7/41

Enrichment of flour, white bread and rolls
Adopted 11/3/48

Establishing grades of milk
Adopted 5/8/35; amended 11/17/48; 6/12/56

Egg Nog
Adopted 6/12/56

Flavored milk
Adopted 6/12/56

Sale of rabbits intended for food purposes
Adopted 5/14/29

Governing the business of cold storage, made under the provisions of General Laws, Chapter 94, Section 67
Adopted 10/10/33

Sterilization of feathers, down, and second-hand material intended for use in the manufacture of articles of bedding and upholstered furniture
Adopted 11/12/35

Making of each article of bedding and upholstered furniture
Adopted 12/10/30; amended 11/12/35

Manufacture and bottling of carbonated non-alcoholic beverages, soda water, mineral, and spring water
Adopted 11/12/35; amended 4/7/36

Uncarbonated fruit beverages
Adopted 5/8/36

Business of slaughtering and meat inspection
Adopted 7/9/31; amended 12/10/35; 9/14/43

Poultry slaughterhouses
Adopted 9/14/43; amended 8/6/46

Approval of contracts for the production and distribution of certified milk
Adopted 10/14/36

Frozen desserts and ice cream mix
Adopted 9/11/34; amended 5/8/56

Bakeries and bakery products
Adopted 2/14/33; amended 1/10/50

Definition of pasteurized milk
Adopted 7/8/41; amended 11/4/41; 6/15/50

Establishments for pasteurization of milk
Adopted 2/12/35; amended 6/15/50; 10/20/53; 6/12/56

Standards and definitions of purity and quality of food
Adopted 2/9/37; amended 5/8/56

Pork products intended to be eaten without cooking
Approved 2/12/24

Dietetic foods
Adopted 5/12/53

Licensing of hospitals and sanatoria
Adopted 4/14/42; amended 2/9/43; 12/14/43; 3/14/50

Licensing of boarding homes for the aged
Adopted 11/3/48

Licensing of convalescent and boarding homes
Adopted 11/3/48

Dispensary license
Adopted 1/12/19; amended 5/13/19; 5/10/38

Dental clinic license
Adopted 8/10/43

General rules for police station houses, lock-ups, houses of detention, jails, houses of correction, prisons, and reformatories
Adopted 1910; amended 4/8/30; 6/15/48

To establish standards for tuberculosis hospitals and sanatoria
Adopted 6/14/27; amended 6/5/28; 8/12/32; 1/17/39; 5/10/38; 10/21/48

Obtaining state subsidy
Adopted 5/11/20; amended 6/5/28; 2/14/33; 3/13/34

Minimum requirements for tuberculosis dispensaries as defined by the Department of Public Health
Adopted 4/6/15; amended 7/11/16; 11/7/19; 7/14/25; 4/11/33

Minimum requirements for uniform dispensary record system
Adopted 7/14/25

Governing the hospitalization of patients with chronic rheumatism
Adopted 5/8/45

Reporting and control of venereal diseases
Adopted 12/18/17; amended 5/12/18; 6/11/18; 3/11/19; 11/12/23; 10/1/25; 10/8/29; 1/14/30; 1/14/36; 8/9/38; 4/11/44; 11/3/48

Treatment of persons suffering from venereal diseases who are unable to pay for private medical care
Adopted 2/14/33; amended 8/10/37; 8/9/38; 9/12/39; 11/6/40; 4/13/48; 11/3/48

Issuance of premarital medical certificates
Adopted 4/11/50

Approved prophylactic remedy for use in the eyes of infants at birth
Adopted 5/12/36

Physical examination of school children
Adopted 3/11/52; amended 8/25/53; 3/9/54; 2/14/56

Labeling of receptacles containing Benzol (Benzene), Carbon Tetrachloride and other harmful substances [approved jointly with Department of Labor and Industries)
Adopted 6/12/56

Regulations promulgated by Director of Marine Fisheries
Approved for sanitary requirements 4/13/42

Legislation

Annually laws are enacted by the General Court conferring additional responsibilities on the Department. Summaries of the work entailed by these additional duties are included in the reports of the individual divisions concerned. Similarly, resolves have been passed providing for special investigations to be made by the Department individually or jointly with other departments.

Following is the legislation submitted by the Department to the 1957 session of the General Court:

1. An Act Authorizing the Department of Public Health to Establish a Sanitary Code. This bill is recommended to fill the great need for integrated legislation in this field. It will eliminate the massive confusion respecting statutory law, rules and regulations and policy.

2. An Act Requiring Approval from the Department of Public Health Before the Commissioner of Corporations and Taxation Issues a Charter of Incorporation for any Corporate Purpose Which Requires a License from the Department of Public Health. This legislation is proposed to coordinate the actions of the Department of Public Health and the Commissioner of Corporations in the specialized instances where a corporation will require a license from the Department of Public Health.

3. An Act Relative to the Keeping of Records by Hospitals, Dispensaries or Clinics, Sanatoria, Convalescent or Nursing Homes, Infirmaries Maintained in Towns, and Boarding Homes for the Aged. This legislation is needed to protect the public who are treated or boarded at these licensed institutions. It corrects an omission in section 70 of Chapter 111 of the General Laws which was noted by the last legislature.

4. An Act Relative to Recording and Making a Report of Births. Under the present law, a vital statistic is not required, namely the weight of the child at birth, because of the invalid and statistically inaccurate notion that it would reveal conception before marriage in some instances. Public health specialists consider weight as an important factor in their compilations.

5. An Act Relative to the Facts to be Recorded by City and Town Clerks Relative to the Definition of a Live Birth. This legislation is proposed to define what a "live birth" is. The present statute has no definition.

6. An Act Relative to the Treatment of Chronic Diseases at Lakeville State Sanatorium. This legislation is proposed to permit patients with chronic diseases to be admitted to the Lakeville State Sanatorium.

7. An Act Relative to Admissions, and So Forth, at Lemuel Shattuck Hospital, Pondville Hospital, and Westfield State Sanatorium. The Department of Public Health offers this legislation so that its institutions will have conformity in the policy of admissions.

8. An Act Providing for the Admission of Persons with a Chronic Disease to County Tuberculosis Hospitals Under Certain Circumstances. This legislation is needed because of the diminishing numbers of patients admitted into county tuberculosis hospitals and the increasing numbers of hospital beds needed for the treatment of chronic diseases.

9. An Act Authorizing Admissions to County Tuberculosis Hospitals of Persons Afflicted with Chronic Disease and Concerning Charges Thereof. This legislation is needed because of the diminishing numbers of patients admitted into county tuberculosis hospitals and the increasing numbers of hospital beds needed for the treatment of chronic diseases. This amendment would extend the statute respecting charges for admissions of tubercular patients and make it applicable to the admission of chronic disease patients.

10. An Act Respecting Emergency Admissions to County Tuberculosis Hospitals for Persons Afflicted with Pulmonary Tuberculosis or a Chronic Disease. This legislation is needed because of the diminishing numbers of patients admitted into county tuberculosis hospitals and the increasing numbers of hospital beds needed for the treatment of chronic diseases. This amendment would extend the statute respecting charges for admissions of tubercular patients and make it applicable to the admissions of chronic disease patients. This covers emergency admissions.

11. An Act Relative to Admissions to Rutland State Sanatorium and Westfield State Sanatorium. This legislation would eliminate the requirements of six months' residence for admissions to these hospitals. The availability of beds and the vital need for hospitalization far outweigh any requirement of residence which would be advantageous to the Commonwealth.

12. An Act Relating to Charges for Support at State Sanatoria. This legislation is proposed to eliminate the complex bookkeeping involved in the collection of unsettled cases, and particularly because the Department's experience has been that is largely ineffectual in its efforts to get payments in these cases.

Future Possibilities in the Department

The seven years covered by this report have been interesting years. It has been a confused period but a dynamic one through which many forces have surged, deepening some old channels and obliterating others. No final pattern has appeared; in no sense has 1956 seen the end of an era and the beginning of another. At best, it can afford a brief pause to look about, and then push ahead.

As a result of many factors, some post-war, others of long standing, two significant changes have appeared in the last decade.

The first is seen in the shift from simple and compartmented problems to those much more complex, reaching at the same time into many phases of individual and community life. Problems — and thereby their solutions — which formerly fell into well defined pigeonholes now are seen as a fluid mixture of many elements like the confluence of streams.

A second sign of the times is the appearance of a lay public much better informed on health matters than ever before. Most significant of all, the public has wanted to be better informed. It is taking keen interest individually and collectively in problems of health, an interest that has never been equaled in previous times.

Specific problems are many and are indicators of these changes. Alcoholism is now clearly recognized as a community question requiring many resources for solution. Traffic and home accidents cannot be ignored as a major public health issue, but at the same time this problem cannot be solved by health workers alone.

If the aging population and chronic disease call for new therapy, it cannot be confined to the hospital, for rehabilitation extends into every corner of community life. Not all the long-known communicable diseases have been controlled, and the large group of virus diseases continues to plague us. In our new means of control of all these diseases, we have a public informed through many sources, which is no longer satisfied by treatment but wants preventive action.

These changes represent the challenge of the future to the Health Department.

In the first place, they demand a degree of reorganization within the Department itself. With a tradition of years, a department at any one time finds itself organized in somewhat static divisions which have grown up largely in relation to the leading problems of the past. New, more complex, broad problems require a much more fluid organization. Mechanisms must be found for increasing the flexibility of the Department's structure. An answer lies partly in a regrouping of divisions into larger units on a functional basis. The new organization, for instance, should be sufficiently flexible to permit establishing a Division of Rehabilitation which would include elements of many other divisions. Coordination of this type will be a vital necessity. An increase in the number of coordinating departmental committees or a heavier responsibility laid upon a single executive committee is to be expected.

Just as within the Health Department such a reorganization lies ahead, so the relation of the Department to other departments of the State Government will change. The Health Department will be represented, and should be, on many more ad hoc commissions, which are in themselves a response to the broader problems of total community life.

A careful revaluation of the responsibilities and duties of the State Health Department in relation to those of local health agencies must come. Here a somewhat paradoxical situation will rule. Although the increasing complexities of community living call for mutual acceptance of some degree of centralized control, the sense of home rule and local responsibility will and should continue to be strong. In general the central authority should develop along the lines of a coordinating body, establishing certain policies applying to all communities. A central office, further, should strengthen its function as a resource agency, providing experts for consultation with local health bodies and for study of specific situations and problems. One of its most valuable contributions will be a continuing evaluation of health services throughout the State. Out of all this will come its final role of acting as a stimulant in the development of health programs.

Operation of most of these programs, however, would seem to be a local health responsibility. So the problems of implementation will come to rest on the local level, where the community situation is best known and best understood. How much territory the local area should include will vary. This question must be carefully scrutinized. There is a minimum size, a minimum population, which can provide, from its own resources, satisfactory local health services. Each community will be called upon by its own people to evaluate its own health services objectively. If these are found wanting, the community must provide additional means through cooperative action with neighboring cities and towns.

Against this background, certain health problems stand out clearly. Specialized care must be provided for the aging and for sufferers from chronic disease. The continuing needless deaths of mothers in childbirth and of infants prematurely born and dying in the first weeks of life must be prevented. Disaster and accident control must be developed. The newer aspects of tuberculosis control through home treatment require evaluation. Facilities for sewage treatment and disposal must be extended to meet the needs of industrial expansion and housing developments. Water resources must be increased to satisfy rapidly increasing demand. Developments in the production and use of atomic energy present new health hazards that must be controlled.

None of these problems can be met by a single simple solution.

One of the most immediate needs for the Health Department is the recruiting and training of professional personnel at every level. Public health is a specialized profession with many facets, calling for expertly trained individuals. It is an

area in which competence can be attained only through hard work and continual study. The Training Division of the Health Department will become one of its most active and important sections.

Another duty of the Health Department in the coming years is to develop closer association between the health officer, the local physician, and the layman in coordinating efforts toward better individual and community health. All three of them must aid in creating and maintaining a well informed public opinion on health matters.

With this cooperation, public opinion on health subjects will rest, as it should, on competent professional advice, with respect for the decisions of experts. The community must then be willing to get out and work for the health services it desires.

Respectfully submitted

Samuel B. Kirkwood, M.D.
Commissioner of Public Health

Public Health Council

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BUREAU OF ADMINISTRATION

DIVISION OF ADMINISTRATION

Upon the reorganization of the Department of Public Health in 1914, a Division of Records and Accounts was established. This division was renamed Division of Administration on December 14, 1915, and there has been a Division of Administration under the direct supervision of the Commissioner of Public Health continuously since that date. It was not until February 8, 1955 that Leon A. Bradley, Ph D. was appointed to be the first Director of the Division of Administration. Dr. Bradley was formerly the Head of the Department of Bacteriology and Public Health at the University of Massachusetts. He came to the Department in 1950 to supervise its Field Training Program, and it was from the directorship of that program that he was transferred to the Division of Administration.

There are three major activities of the Division; fiscal, personnel, and legal affairs. The fiscal office formerly consisted of a business office and a fiscal office; the former under the supervision of Mr. Louis A. Phaneuf and the latter under the supervision of Mr. Thomas Mackey. Upon their retirement, Mr. Harry W. Attwood became the first Assistant Director, Business Agent, a title and responsibility he has maintained ever since. The fiscal office prepares the budgets, both State and Federal, under the direction of the Commissioner; is responsible for the execution of the budgets in all details; pre-audits and post-audits expenditures made by the Department; prepares monthly reports for both Federal and State accounts; processes all travel vouchers and State automobile accounts; and prepares payrolls for employees of the Department.

The personnel section processes all requisitions for permanent, temporary, and emergency employment; cooperates with the Division of Civil Service in the preparation of posters for Civil Service examinations; and maintains the personnel records for the Department and its institutions.

The legal section follows all legislation pertaining to public health; assists in the preparation of bills to be introduced by the Department; and generally advises on all legal matters before the Department.

The funds of the Department come primarily from State appropriations and Federal grants and to a lesser extent from private sources. The expenditures for the year ending June 30, 1956 amounted to $7,955,727.33 ($1.64 per capita) for institutional care and $5,469,922.93 ($1.13 per capita) for other public health activities. All funds for institutional care are received from State appropriations. Funds from Federal and private funds, amounting to $2,133,036.93, were expended in the general program. This amount includes $930,468.80 expended for polio vaccine purchased directly by the government for use in the Massachusetts program. The Federal Government contributed 39 per cent of funds expended by the Commonwealth for health services, exclusive of institutional care.

It is interesting to note the increase in the number of employees in the Department from the period of January, 1950 through June, 1956. On January 18, 1950 there were employed in our institutions 1246 persons. Since that time the Lemuel Shattuck Hospital has been constructed and placed in operation, and the Department has been charged with the operation of the Massachusetts Hospital School. As of July 1, 1956 there were employed 2098 persons in our institutions. However, 849 were employed at the Lemuel Shattuck Hospital and the Massachusetts Hospital School. The number of employees in other institutions as of July 1, 1956 was 1249, indicating that there has been very little change in employees at our other institutions. The number of employees in the Department other than in institutions has remained relatively constant in the figure just below 600. In December, 1952 there were 591 employees, whereas in January, 1956 there were 588.

DIVISION OF TRAINING AND RESEARCH

The guided missile of public health is the trained worker. Direction must be built in with power. This is not a new concept, and for many years the Division of Training has been actively engaged in the training of local and Department personnel. It was not until 1950, however, that steps were taken to coordinate the training activities of the various divisions and sections of the Department and to expand the program to include supervised field experience for health officers, nurses, medical social workers, health educators, and sanitation personnel.

The objectives of the Division of Training since 1950 have been:

(1) To provide pre-service and in-service training courses for all types of public health workers associated with or employed by health agencies.

(2) To serve as an accredited field training unit for approved schools of public health, medical social work, and public health nursing.

(3) To provide supervised field experience recommended as a component of, or as a supplement to, academic instruction for other professional and subprofessional groups.

(4) To be a research center for the development of administrative and organizational patterns for training, special curricula, instruction techniques, and evaluation practices.

The Division of Training is now prepared to serve not only as a coordinating agency but to participate in the planning, preparation, and presentation of comprehensive training programs for employees of State and local health departments and for students from colleges, schools, and universities who are preparing for professional careers in the various public health specialties.

In 1950 a five-year grant from the W. K. Kellogg Foundation made it possible to establish the New England Field Training Center at the University of Massachusetts, with assistance from the Communicable Disease Center of the Public Health Service. The scope of field training was expanded to include not only sanitation personnel but also public health physicians, nurses, and health educators. Field training for medical social workers was also made possible through funds provided by the Children's Bureau.

Perhaps the most significant trend responsible for the enlarged scope of the training program has been the increasing demand for more highly specialized and better trained workers in State and local health agencies. This meant that orientation and apprenticeship training must be extended beyond the Department to the personnel of health agencies serving the public directly. Short courses, institutes, seminars, clinics, and workshops have been established. In fiscal 1954–1955 a total of 165 courses were given to 14 groups comprising 5279 persons. Visitors from health departments and agencies throughout the country and abroad, new employees, and students of public health and preventive medicine received the benefits of the expanded program.

In the field training area, students received supervised experience in local agencies, and field teachers in these agencies attended refresher courses. Not only did the trainees themselves benefit, but the agencies enjoyed a better trained and more extensive instructional staff; both local health units and the Department were aided in the recruitment of professional personnel. The intimate contact between students, agency employees, and administrators helped in the subsequent placement of trainees, especially in the field of environmental sanitation.

Other important developments in this period were the residency program for career physicians in public health, which was approved by the American Medical Association in 1951, and stipend assistance for full-time or part-time study in various institutions by members of the Department and local health units. In 1952–1953, for instance, full-time study was carried on by two physicians, four public health nurses, four medical social workers, two health educators, a sanitary chemist, and a sanitarian; 15 other persons did part-time post-graduate study.

The orientation of foreign visitors served to extend the Department's influence to the far corners of the world. Because of its importance as a world medical center,

Boston attracts a large number of these visitors. They are sponsored and assigned to the Department by the Division of International Health of the Public Health Service, the World Health Organization, and other agencies participating in global health programs. Itineraries are scheduled within the Department and with other public health and medical facilities of the area. During the past year 48 of these trainees have been channeled through this Department for less than two weeks observation periods, and 22 for longer periods. Their varied interests required the preparation and supervising of 38 different schedules in 14 fields of interest.

The Medical Social Training Project

One of the significant events of our time has been the recognition of social work as a vital part of the public health effort. Massachusetts was the first state to add this activity to its public health department. Special interest therefore attaches to the Medical Social Training Project, which was established in 1949 through a grant from the Children's Bureau, in cooperation with the three schools of social work in Boston and the Harvard School of Public Health. The stated objective was to increase interest in and knowledge of public health among social workers, and thus to help in meeting the shortage of personnel for social work positions in public health agencies.

Through this project academic training has been combined with supervised field work. Its purposes include provision of accredited field experience and classroom instruction for medical social work students, and of non-accredited field experience and orientation for workers in service; collaboration with the schools of social work, participation in staff development, and cooperation with the Department's Section of Social Work and Division of Training on special training projects. An important feature of the Project's program has been provision of both district health offices and institutions as areas for field experience.

From 1950 to 1955, accredited field work training was provided for 18 second-year graduate students in medical social work (11 women and seven men), for one first-year student, and for one student taking an advanced program. The students spent three days a week in the field for nine months and attended classes the remaining two days. Seven of these 20 students came from six different states outside of Massachusetts and from Hawaii.

Field observation visits to districts and hospitals, varying from one day to a month, were made by 164 students from the three schools of social work and the Harvard School of Public Health, and by 25 social workers, an educator, and two lay leaders in social work programs from five states and 14 countries. Three of these visitors were medical social work faculty representatives from schools of social work or public health.

DIVISION OF HEALTH INFORMATION

Information and education in public health can be distinguished but not separated — they interfuse. In the early part of this period health education was emphasized by the Division of Health Information. Health educators were assigned to district offices and worked in local communities to stimulate formation of regional health units; close relations were established with health educators in outside official and voluntary organizations.

As time went on, however, the stress was thrown more and more on the collection and distribution of information. Health education as such received less attention, partly because of cuts in appropriations, but chiefly because of a lack of properly trained and qualified personnel. It is true that in 1955 a health educator from the central office was working in the Northeastern District, and another was helping to promote the important Children's Accident Prevention Program of Greater New Bedford. But the rest of the staff, although formally classed as health educators, were actually specialists in communication of one kind or another. What the Department needed — and was getting — was the assistance of a service division which could aid in formulating, processing, and disseminating the information and educational material emanating from the various bureaus and divisions.

Another vital function of the Division was that of effecting closer working relationships with the public health forces beyond the walls of the Department. This might take the form of helping an executive secretary to develop a promotional program, preparing a manuscript for a division head and getting it published in a medical magazine, or putting together an exhibit for a convention.

History is more than the recording of events, and it is more important to live history than to write it. Nevertheless, the events must be recorded. The outstanding developments and achievements in our division were the following.

Personnel

Until 1950, health information was carried on by a section in the Division of Administration, with a part-time head. In that year, a full-time chief was appointed and a production expert was added to the staff. In 1952 the section became a division, with a physician as its director. In succeeding years the staff was strengthened by acquiring a seasoned newspaperman, a skilled photographer, and an equally skilled artist. In the spring of 1954 an editor with long experience was appointed to take charge of manuscript preparation, write and edit reports, and assist with publicity.

Services

Photography and Art Work

An outstanding joint accomplishment of the artist and photographer was a television program on tuberculosis, prepared in collaboration with the Massachusetts Tuberculosis and Health League. The project involved over two months' work and effected a large saving for the Department. This film was later used for health education purposes throughout the State.

Art work included the development of exhibits, the originating of covers and posters, the preparation of charts, graphs, and so forth, and the designing and execution of brochures, flyers, and other audiovisual aids. The artist also acted as technical consultant for the Department and allied agencies.

The photographer's primary function was to supply pictures for the Department's publications. This involved documenting activities in private hospitals or State institutions and field work by Department personnel. Photographs were prepared for exhibits, television programs, news stories, Sunday rotogravure sections, and syndicated magazines. Slides were produced for in-service training programs, for general audiovisual purposes, and as part of the school health education program.

Library and Film Service

The library underwent improvements and received numerous additions. Its services were extended to public health workers and physicians both within the Department and from this country or abroad. Approximately 2000 requests for

literature and information were received each year. Also, the librarian handled hundreds of telephone calls from agencies and individuals needing information or assistance.

The film service circulated about 1500 films yearly.

Publicity

Besides routine news releases to daily and weekly newspapers through the State, radio and television contacts were made in special situations such as the polio vaccine field trials of 1954 and the hurricane emergencies of 1954 and 1955. Closer ties were established with the *New England Journal of Medicine*, the Harvard School of Public Health, and the news services in the State House. A mailing list of medical and public health organizations and periodicals was compiled for releases of special significance.

Publications

In 1953 the weekly *Public Health Bulletin Board* made its appearance, incorporating the news formerly circulated in the *Communicable Disease Bulletin*, and announcements and news items previously published in the *Newsletter*. In this same year *Newsletter* was renamed *Commonhealth* and received a new format. The editorial style of both these publications was improved and their mailing lists were steadily enlarged. By 1955 the circulation of *Commonhealth* was about 4000, including state health departments throughout the nation, and the weekly bulletin, rechristened *This Week in Public Health*, was going to approximately 1400 individuals and organizations in the State.

Distribution and Printing

Along with the usual mailing services, the Division assumed responsibility for the annual State-wide distribution of school health record forms — a burden previously borne by the Division of Maternal and Child Health. Routine requests for public health literature increased in number. The printing and binding of pamphlets, leaflets, and other literature advanced both in quality and in quantity.

BUREAU OF HEALTH SERVICES

In the period up to 1954, Dr. Robert E. Archibald was in charge of the Bureau of Preventive Medicine, which included the Divisions of Local Health Administration, Maternal and Child Health, Communicable Disease Control, Venereal Disease Control, and Dental Health. In 1954, the Divisions of Communicable Disease Control, Venereal Disease Control, and Dental Health were continued in the Bureau of Preventive Medicine with Dr. Herbert L. Lombard as Bureau Chief; and Dr. Archibald was put in charge of the Bureau of Health Services, comprising the Division of Maternal and Child Health Services and the Division of Local Health Services, which includes the Sections of Public Health Nursing, Medical Social Work, Nutrition, and Civil Defense, and the district health offices. The Bureau chief, although acting as a deputy commissioner earlier, replaced Dr. Alton S. Pope officially as Deputy Commissioner in 1954.

DIVISION OF LOCAL HEALTH SERVICES

In July, 1950 the position of Field Program Supervisor was established in the Division of Local Health Services with Mr. Rudolph K. Holly appointed to the position.

In 1949, as a direct result of the findings and recommendations of the special commission to study and investigate certain public health matters, appointed by Governor Bradford in 1947, the Union Health Department Act was passed and went into effect on November 3, 1949. The following year a State-wide citizens' committee with one representative from each community was appointed by the Governor for the purpose of informing the people of the Commonwealth regarding the intent of this legislation. A health educator was assigned full-time to work with this committee. At the request of interested local groups, 86 towns in the State had official committees appointed by their town moderators to study and investigate the plan and make recommendations to their respective towns as to what action should be taken by the town. Many of these committees reported favorably, and several communities actually voted at town meeting to have their town join with neighboring communities to form a union health department. However, the Union Health Act was amended on July 1, 1953 to become an Act Relative to the Organization of Regional Health Districts. The compulsory feature of the law was removed and as a substitute, a small subsidy of 50 cents per capita could be provided for initial capital outlay by a regional health district. To date, no communities have taken advantage of this permissive legislation to set up a regional health department.

However, during the years covered by this report, many improvements have been made in local health services and facilities; for example, since 1950 new health centers have been established in the following five communities: Brookline, Quincy, Salem, Wayland, and Springfield. A building has been promised to the Randolph Board of Health to be utilized as a health center, but will not be made available until 1957. Many communities for the first time have employed either a medical health officer or a full-time non-medical administrator, with the result that at the present time there is a total of 20 full-time local health units administered by a physician and 33 under the supervision of a non-medical administrator. Eighty-six per cent of the population of the State reside in these communities. The Nashoba Health Unit added three towns to its membership and strengthened its entire health program. At the present time it is functioning very satisfactorily.

Another interesting development was the setting up of associations of boards of health. The Metropolitan Health Officers Association enlarged its membership by including cities and towns outside of the Metropolitan Boston area. An association of boards of health was established in Plymouth County and another in Berkshire County. In addition, a Southeastern Association of Boards of Health was developed. The officers of these associations were requested to serve as an advisory committee to the Department, and semiannual meetings have been held. This advisory committee has been extremely helpful in advising the Department regarding many of its problems. Likewise the Commissioner has an opportunity to assist in solving major problems of our local health departments.

In 1955 the Division prepared a manual of information for local boards of health which was distributed throughout the State.

The home accident prevention study begun in 1948 was continued by the Division of Local Health Administration up to the time that a grant was received from the Kellogg Foundation, when the program was taken over by the Division of Environmental Sanitation. In 1950 the Nursing Section prepared an excellent manual entitled *Home Accident Prevention for Public Health Nurses.* This was given wide distribution throughout Massachusetts, and on request, many copies were forwarded to other States. The Division made a study during 1951 of environmental factors involved in all deaths from accidents in the home. In 1949–1950 and 1951–1952 the Department received certificates of commendation from the National Safety Council for its efforts in home accident prevention.

Northeastern District

In 1949 the Northeastern District consisted of 45 communities served by a staff of nine professional workers. By 1956 its boundaries had been extended south and west to include 68 communities with a total population of 1,516,102 and served by a district staff of 16 trained public health workers. In September, 1955 the district office was transferred from the town of Wakefield to the North Reading State Sanatorium.

During the six-year period of this report, there has been more emphasis placed on training opportunities. School physicians, obstetricians, physicians attending well-child conferences, local nurses, and sanitarians have been stimulated to participate in planned courses. Graduate social service students continue to be assigned to the district health office for field training. Employees of local boards of health, particularly sanitarians, have been encouraged to take part in university refresher courses. Three seminars for teachers of health education have been held. Concomitant with on-the-job training programs the district staff has assisted local communities in securing services of new trained personnel.

Better acceptance of training opportunities and almost complete cooperation in the single-session specialized educational meetings have been noted. This became evident at the time of the establishment of the new School Health Regulations, when attendance at orientation meetings for superintendents reached almost 100 per cent. Similar meetings were held for individuals concerned when the "Premature Infant Law" became effective and the "Preferred and Minimum Standards for Day Care Centers" were established.

In the area of promotional effort to raise the quality of local health services, all members of the district team participated in the educational activities for the interpretation of the Union Health Law. In 13 communities local study committees were formed. A complete statistical analysis of local expenditures for health services in each community of the district was completed. Some of the interest and better understanding of public health generated by this extensive promotional program continues today. Local boards of health have been stimulated to revise obsolete regulations. Certain communities have taken the necessary steps to establish independent boards of health. Increasingly, employing agencies have sought trained personnel, especially in nursing and sanitation. As of the date of this report, 49 communities have adopted milk pasteurization regulations and 52 communities have initiated approved tuberculosis case registers.

The Northeastern Health Officers and Agents Association has been absorbed by the Metropolitan Health Officers Association.

Programs for the demonstration of topical application of sodium fluoride to the teeth of children were conducted. An increase in the number of communities adding fluorides to the local water supply has been observed. Fourteen communities have voted action on fluoridation; nine of these are actually adding fluorides.

In 1952 the City of Salem undertook a self-survey of health facilities and services. The Salem Health Center materialized largely as a result of this study. Other experimental programs include the Gloucester diabetes survey in 1950 and the contribution to home accident information provided by the Lynn study of 1949.

Six communities participated in the original Salk polio vaccine trials of 1954 with about 75 per cent participation by the eligible children. By 1955 and 1956 mass inoculation programs were undertaken by every community. As an aftermath of the widespread polio epidemic of 1955, all staff members participated in a coordinated plan to assist local communities in setting up plans and facilities for adequate follow-up of cases.

In 1956, all staff members were given specific Civil Defense assignments and oriented to their responsibilities and functions in serving as the nucleus of the medical and health services section of Civil Defense Area I.

The changing emphases and needs of public health generally have been reflected in the demands on specific staff programs. The trend to suburbia has increased local sanitation problems and necessitated more assistance from sanitation staff in the areas of sewage disposal, water supply, and problems of pollution.

The needs of our growing aged population increasingly are the educational concern of the staff.

With a booming population of youngsters there is generally greater interest in assurance of an adequate medical examination of children at the time of preschool registration. The indices of immunization continue to go upward, with almost universal use of the triple antigen.

Mental health is another area of citizen interest with public health implications. Of the seven active local community councils, five have been concerned with mental health projects as their field of "health" activity.

Southeastern District

Change has been the dominant note in the health districts south of Boston. The suburban towns near Boston saw marked increases in population in the late 1940's, and by 1949 most of the communities within 15 miles of the city were beginning to experience serious growth problems. As these small towns commenced to expand, lacks became obvious — zoning laws seldom had been adopted, housing developments were not controlled, sewage disposal regulations were inadequate, public water systems needed extension, trained personnel including sanitarians and public health nurses were not available. Following these lacks very closely were the inadequate school facilities that confronted the towns and the high tax rates following construction of new schools. Reluctance of towns to spend funds for health programs in view of their heavy school costs slowed health department progress until problems such as private sewage disposal became acute, and it became apparent that the population growth of the southeastern towns was not merely a temporary increase.

In order to meet the problems of the towns as they changed, changes in the district health program were necessary. Specific consultation service regarding housing developments was offered, and there were concentrated efforts to encourage the adoption of suitable health regulations to protect both the towns and the persons moving into the communities. Where local personnel were lacking the local boards of health were encouraged to obtain trained personnel or to provide training for local personnel interested in a future in public health. The district staff, rather than providing direct service to local boards of health, has provided consultation and instruction to local personnel, a time-consuming process but in line with the general policy of turning the health programs back to the local boards of health.

Some specific instances where progress in health departments can be noted are the establishment of health centers and the employment of full-time personnel. Three health centers — Quincy, Wayland, and Brookline — have been built and opened. A number of towns have appointed agents — Hull, Marshfield, Norwood, Milton, Natick, Randolph, Abington, East Bridgewater, Avon, and Somerset — and there have been additional school nurses employed in many towns. Services of existing voluntary nursing agencies have been purchased in still other communities to meet their public health nursing needs. Several communities have adopted fluoridation of their water supplies, including Hingham, Hull, Sharon, Seekonk, Medway, and Cohasset.

Progress in intercommunity interest and understanding is seen in the formation of a number of groups of local and area personnel. The Quincy Inter-Agency Group, composed of health, education, welfare, youth, and related personnel in Quincy and the nearby area, has been an organization that has stimulated much cooperative functioning of the agencies concerned. Similar organizations in southern Norfolk County and in part of Plymouth County made up of local personnel from a number of towns also have been active. The Southeastern Association of Boards of Health and the Plymouth County Association of Boards of Health have proved an excellent means of education and communication among the members of boards of health. Local solution of local health problems is the ultimate goal for these organizations, and they present an encouraging picture for future improvements in the health program.

Major changes in the district lines and consolidation of personnel have occurred during the period between 1954 and 1956. Eight of the cities and towns of the North Metropolitan District were assigned in 1954 to the South Metropolitan District Office, located in Quincy, raising the number of towns in that district from 49 to 57. In July, 1954 the Southeastern District Office in New Bedford moved to a building on the grounds of the Lakeville State Sanatorium in Middleboro. In September, 1955 the South Metropolitan District Office in Quincy moved from the Quincy Health Center into this same building and the new district was consolidated as the Southeastern Health District. In May, 1956 six towns along the western border were transferred to the Central District to conform to Civil Defense area lines. The present district now includes 103 cities and towns served by a field staff of 16 plus a clerical staff of five.

Civil Defense assignments were made in the spring of 1956, incorporating all members of the staff into the medical and health services section of Civil Defense Area II.

Central District

On July 1, 1949 most of the area now considered as the Central District was served by two district health officers and their staffs. One, the North Central District, had its headquarters in the building in Ayer now used by the Nashoba Health Association. The other, the South Central District, had its headquarters at 476 Main Street in Worcester.

During 1949, the main effort and objective, aside from routine functions, was the promotion of local health units, in connection with the Union Health Law. The work of the district staff along this line assisted in bringing about the following:

(1) The reactivation of the Nashoba Association with an increased membership of towns.

(2) The formation of the Norwoco (Northern Worcester County) Health Association, including the towns of Hubbardston, Phillipston, Royalston, and Templeton.

The Nashoba Association has gone on to increased membership and scale of functioning. The Norwoco Association has remained in its original state as an association for public health and bedside nursing, in spite of the efforts made at its inception to develop it into a local health unit, with some of the more essential local functions of such a unit.

In 1949, as the result of the expansion of the Nashoba Unit, the district office was moved from the Nashoba building to Fitchburg, where it remained until the move to Rutland State Sanatorium in 1955.

The years following 1949 saw the fading out of some of the district activities, together with the taking on of new activities in other fields. For example, with the diminishing of financial resources, the district lost the services of the sanitation officer, and this important field of activity in relationship with local health departments was necessarily neglected, except in the instances of emergencies and special problems.

The inspection and licensing of nursing and boarding homes and town infirmaries became an important activity of both district staffs in cooperation with the two nursing home inspectors. The inspection program was developed to a high degree

and included formal invitations for instruction of the proprietors of such places, together with informal conferences as the occasion required.

There was considerable activity in the field of dental health, through the efforts of the dental hygienists in the district offices and other members of the staff.

Fluoridation of the public water supply has become an accomplished fact in Athol, Templeton, and Shrewsbury. Fluoridation was well on its way to accomplishment in Ayer and in Gardner, but was indefinitely shelved as the result of the efforts of certain groups. A great deal of study work laying the foundation for confirmation of favorable results from fluoridation in Athol has been done.

The chief problem in the field of communicable diseases resulted from the large number of cases of poliomyelitis which occurred in the late summer and fall of 1955. Members of both district staffs were actively engaged in the follow-up and case recording resulting from this outbreak. Some of the nurses were engaged in the care of polio patients.

The tornado in June, 1953 and the floods in 1954 engaged the district staff members, particularly those in the South Central District, in disaster work, in coordination with the Civil Defense Agency.

In September, 1955 the office of the North Central Health District was moved to the Rutland State Sanatorium and its title was changed to Central District (North). In March, 1956 the office of the South Central District was moved to the Rutland State Sanatorium also. The combined offices at Rutland are now designated as the Central District and render services in an area corresponding to that formerly covered by the North and South Central Districts.

Western District

Since August, 1951 the district health officer in the Amherst office has had the responsibility of supervising the Connecticut Valley and Berkshire districts. In 1955 this entire area was designated as the Western District with the Amherst office as headquarters. The Pittsfield office continued in operation. In this same year the Western District was made to correspond with Civil Defense Area IV, and the district health officer serves as Civil Defense Area Medical Officer.

Considerable progress has been made in improving local health services. As the result of a survey made in Agawam by Professor Ira Hiscock of Yale, a full-time trained agent-sanitarian was employed in 1953. Other towns appointing a full-time trained agent-sanitarian were South Hadley and Amherst. The city of Holyoke for the first time appointed a full-time physician as director of public health. In 1955 the Berkshire District Association of Boards of Health was organized. At the request of this association, a detailed study of the cost of local health services in each community in the county was undertaken and accomplished. This study stimulated considerable interest in the need for improvement of local health services.

Floods in August 1956 caused great damage in Holyoke, Russell, Westfield, and Easthampton.

During the period covered by this report, seven communities in the Western District adopted pasteurization regulations.

A State-aided cancer clinic was established in the Pittsfield General Hospital in February of 1956.

The public health nurses arranged for a series of weekly meetings each spring and fall for local public health nurses. The topics discussed were based on the needs expressed by nurses in local communities.

Through the efforts of the nutritionist, several new school lunch programs were established and were used for the purpose of teaching better nutrition to school personnel and the children.

The social workers and physiotherapists were required to carry a heavy case load in connection with the Greenfield, Pittsfield, and Springfield crippled children's clinics.

It is of interest to note that during this seven-year period, not a single community in the Western District implemented fluoridation of the public water supply although a great deal of discussion and education was carried on throughout the area.

Nursing Section

This period has seen some changes and progress in the activities of the Nursing Section. The two three-year demonstration programs of public health nursing in local communities (Princeton and Sterling; and Templeton, Royalston, Phillipston, and Hubbardston) were completed and accepted by these local communities as their responsibility.

During the reorganization of the Department of Public Health, Public Health Nursing became a section instead of a bureau, and was transferred from the Division of Administration to the Division of Local Health Services.

Educational activities have increased, and now a pattern for in-service education for local public health nurses has been established. The public health nursing supervisor in each district office is responsible for planning a series of weekly meetings each spring and fall, based on the needs expressed by nurses in local communities.

A Maternity Nursing Institute, sponsored by the Department of Public Health and the Massachusetts Chapter of the American Academy of Pediatrics, and of three days' duration, has been held annually for the past three years at the Boston Lying-in Hospital for local hospital and public health nurses.

Other workshops have been held on the Infant and Preschool Child, the Nurse in the School Health Program, Cancer Nursing, and Field Teachers Instruction in Public Health Nursing Agencies.

Members of the Public Health Nursing Section participated in developing a Home Accident Prevention Manual for Public Health Nurses, a Survey of Maternity Nursing Services, a Salary Study of Public Health Nurses throughout the State, and a Study of Nursing Resources for public health nursing students in universities.

Members of the Section have also participated in and conducted studies of public health nursing services as requested in local communities throughout the State.

Members of the Section continue to serve on many professional committees, representing the Department of Public Health.

Personnel Changes — At the close of World War II, all positions for staff nurses in the district health offices were discontinued. The pediatric nursing consultant was assigned to State Civil Defense headquarters. Our consultant nurse in tuberculosis resigned. The activities of the Nursing Section are handicapped by the loss of these two nurses. Nurses working in local communities constantly indicate a need for assistance in both of these areas. With the increasing numbers of tuberculosis patients requiring nursing care in the home and the problems of mothers with young children, it is important that consideration be given to providing these services.

Social Work Section

By the year 1950, one or more medical social workers had been assigned to each of the eight district health offices, responsible for all of the social services which might be offered or requested of the Department. Direct case work service to patients was increasingly supplemented by consultation service on the health and social problems of individuals, many of whom were not under any program of public medical care. Physicians asked for help in making plans for terminal care of private cancer patients; hospitals sent parents of children requiring institutional care. In addition, in the districts, social workers were increasingly identified with community activities in stimulating and expanding health and welfare resources, and with educational projects both inside and otuside the Department. This expansion continued until 1955, when district offices were transferred to isolated locations and increased expense for personal or telephone contacts necessitated a different approach to the social and health problems of the areas.

The educational project of the Section has shown steady progress. In 1950, three students from the Boston schools of social work were accepted for eight months' field work training in public health. Each year since then, three or four students have received field training in public health social work. In 1952, through a further grant from the Children's Bureau, it became possible to offer four fellowships in public health social work to qualified students who had completed one year of post-

graduate study in a school of social work. In addition to students under this plan, the Medical Social Work Training Project has been responsible for observation or field experience of varying lengths for some 150 other persons. Also, there has been close collaboration with the schools of social work in developing public health content in the curriculum.

With the opening of the Lemuel Shattuck Hospital, the Section offered consultation service in the selection of a head social worker, and social service became an integral part of the program in this as in other Department institutions. The transfer of the Massachusetts Hospital School from the Department of Public Welfare in 1954 was a further step in the integration of services for the orthopedically handicapped, beginning with social services in the clinics for crippled children and continuing in the social service departments of the institutions. Even when children were referred for surgery to non-governmental hospitals, this integration continued to function through careful policy planning with the hospital social service departments.

During this period, there has been increased participation in program making and policy planning in connection with a wide range of projects and organizations. Among those for which section help in planning or section consultative or supervisory service has been requested are the following: projects for research in heart disease and abnormal pregnancy; services for children with hearing loss; a study of the problems faced by the parents of handicapped children; a study of social service needs in a county tuberculosis sanatorium.

Service on the School Health Council, on the State Planning Committee for Polio, and on the Tufts College Committee on Cleft Palate Problems, advice and assistance to the National Foundation for Infantile Paralysis, to Group Approach in Rehabilitation, to the Massachusetts Cerebral Palsy Association, and many similar agencies are other indications of the broadening influence of the Social Work Section.

The major area of social work activity remains in relation to services to mothers and children in well-child programs, in school health, and in providing social services to children and their families where there are psychosocial problems related to illness and handicap. Increasingly during the past decade, the social workers in the Department have become active in the problems of the aged and chronically ill, both in individual services and in community planning.

Nutrition Section

Direct service has given way to consultation service in the years since 1949. The change of emphasis made possible the extension of nutrition education throughout the health services. Direct service was continued chiefly to patients in Crippled Children's Services, a few local well-child conferences, and to individuals on request.

Nutrition education for more people resulted when consultation and instaff training were begun. A nutritionist was in each district office to give training not only to district staff members but to the staff of local public and private agencies, particularly those which reached families. By keeping members informed of nutrition developments, by interpreting nutrition research, and by supplying nutrition education materials, they in turn were able to recognize the nutrition implications in their particular disciplines and could motivate those within their sphere of influence to practice better food habits.

Nutrition workshops, institutes, conferences, and in-service education programs for nurses, teachers, dietitians, community nutritionists, home economists, and school lunch personnel were a part of each year's program. Meetings and demonstrations were arranged for those having adults or children in group care in boarding and nursing homes, day care centers, and children's homes.

The school lunch program in all its phases was a major interest. Working with the Office of School Lunch Programs local participation was stimulated, help given in maintaining standards and increasing pupil acceptance, and nutrition education promoted with the school lunchroom serving as a laboratory where nutrition knowledge could be put into practice.

Food habit surveys proved valuable in arousing local interest in better nutrition. These surveys were joint projects of parents, school administrators, teachers, and school lunch personnel. Another type of survey was made during this interval as a part of the hypertension study.

Increased interest in problems of the aging involved their better nutrition and work with weight control, chronic disease, heart, and cancer programs.

Curriculum planning and revision of courses of study was done with those teaching nutrition in schools for nurses and licensed attendants.

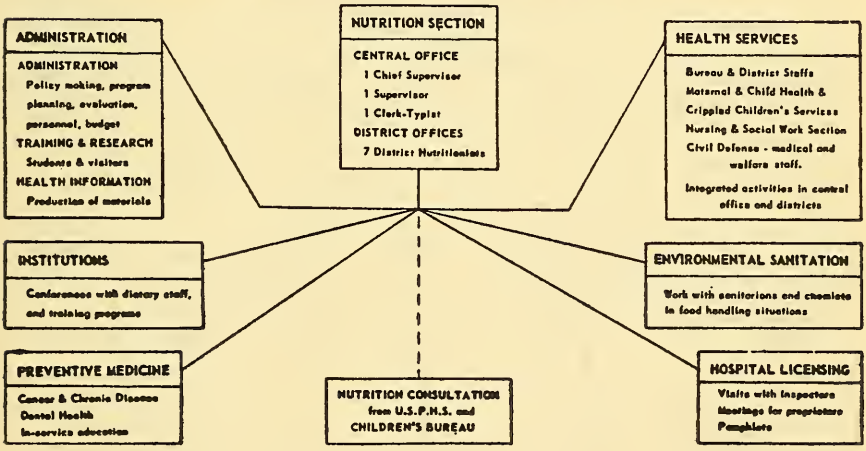
Civil defense and disaster planning were a part of the nutrition program. Materials for use in training local groups in mass feeding were prepared as a joint effort of the Department of Public Welfare, the Red Cross, and the Massachusetts Dietetic Association.

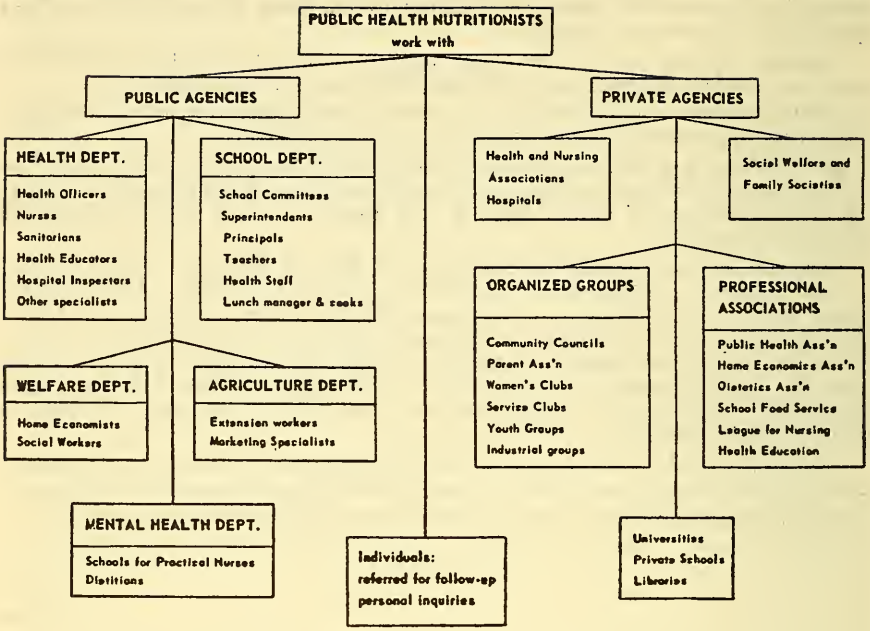
Students and public health workers from 24 different countries and all sections of the United States visited the Nutrition Section for orientation. Graduate students from the Universities of Tennessee, Western Reserve, Harvard, Cornell, Columbia, and North Carolina, and Simmons College came for field work to complete the requirement toward an advanced degree in nutrition. Dietary interns from the Boston Dispensary and from Peter Bent Brigham, Mount Auburn, Beth Israel, and Massachusetts General hospitals came for a day's field experience in public health nutrition.

Leaflets, pamphlets, and slides were developed to meet particular needs, and commercial films, filmstrips, and posters were evaluated for use in teaching nutrition.

The accompanying chart shows the role of the nutritionist in public health.

COOPERATIVE ACTIVITIES WITH DEPARTMENT STAFF




PUBLIC HEALTH NUTRITIONISTS
work with
PUBLIC AGENCIES
PRIVATE AGENCIES
HEALTH DEPT.
Health Officers
Nurses
Sanitarians
Health Educators
Hospital Inspectors
Other specialists
SCHOOL DEPT.
School Committees
Superintendents
Principals
Teachers
Health Staff
Lunch manager & cooks
Health and Nursing Associations Hospitals
Social Welfare and Family Societies
ORGANIZED GROUPS
Community Councils
Parent Ass'n
Women's Clubs
Service Clubs
Youth Groups
Industrial groups
PROFESSIONAL ASSOCIATIONS
Public Health Ass'n
Home Economics Ass'n
Dietetics Ass'n
School Food Service
League for Nursing
Health Education
WELFARE DEPT.
Home Economists
Social Workers
AGRICULTURE DEPT.
Extension workers
Marketing Specialists
MENTAL HEALTH DEPT.
Schools for Practical Nurses
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Individuals:
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Private Schools
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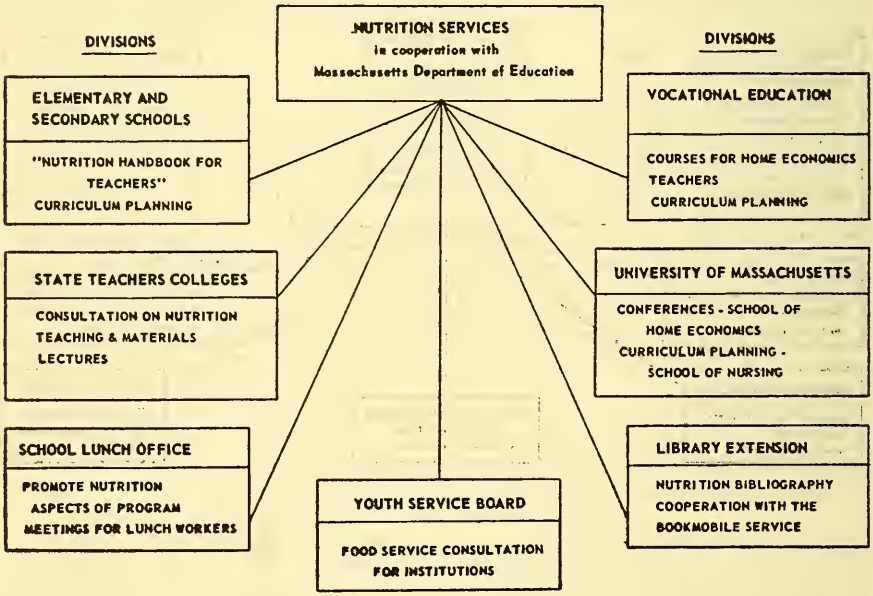

NUTRITION SERVICES
in cooperation with
Massachusetts Department of Education
DIVISIONS
DIVISIONS
ELEMENTARY AND SECONDARY SCHOOLS
"NUTRITION HANDBOOK FOR TEACHERS"
CURRICULUM PLANNING
VOCATIONAL EDUCATION
COURSES FOR HOME ECONOMICS TEACHERS
CURRICULUM PLANNING
STATE TEACHERS COLLEGES
CONSULTATION ON NUTRITION TEACHING & MATERIALS
LECTURES
UNIVERSITY OF MASSACHUSETTS
CONFERENCES - SCHOOL OF HOME ECONOMICS
CURRICULUM PLANNING - SCHOOL OF NURSING
SCHOOL LUNCH OFFICE
PROMOTE NUTRITION ASPECTS OF PROGRAM
MEETINGS FOR LUNCH WORKERS
YOUTH SERVICE BOARD
FOOD SERVICE CONSULTATION FOR INSTITUTIONS
LIBRARY EXTENSION
NUTRITION BIBLIOGRAPHY
COOPERATION WITH THE BOOKMOBILE SERVICE

Civil Defense Section

The Massachusetts Civil Defense Agency was established in 1950 as a staff agency for the Governor to enable him to carry out his responsibilities under the Massachusetts Civil Defense Act.

The Commonwealth of Massachusetts Executive Order No. 25, dated January 3, 1955, delegated to the Department of Public Health the responsibility for providing the Director, Massachusetts Civil Defense Agency, with a full-time staff with which to operate the Medical Services. This staff is responsible to the Director of Civil Defense and to the Commissioner of Public Health.

All bureaus of the Department of Public Health have an integral part in the Civil Defense structure, and all members of the Department are assigned secondary and highly important functions in Civil Defense, which whenever possible parallel their regular assigned duties with the view of utilizing their skilled and highly specialized knowledge.

In addition to the personnel problem the Medical Services of the Massachusetts Civil Defense Agency is concerned with the over-all picture of public health problems that would be likely to arise out of natural or enemy-caused disasters. The Service is responsible for casualty care and all the auxiliary services that such care implies; for example, establishment of casualty stations, transportation of casualties, complementing available hospital facilities, and substituting for those destroyed.

The Service comprises many divisions such as Disease Control, Environmental Sanitation, Mortuary, and Blood sections, and is intimately concerned with the personnel problem on a State-wide basis, maintaining a constant recruiting service for personnel allied to the medical profession. Close liaison is maintained with other services such as Rescue, Radiac, Water, and Engineering. The relation with the Welfare Service is particularly close, as the problems arising out of the care of evacuees and casualties of disaster are immediately obvious and of such magnitude as to stagger the imagination.

The maintenance of supplies is extremely important, and they are strategically placed throughout the Commonwealth so as to be available upon request of communities when needed and within the shortest possible time. Nearly 300 first-aid stations are scattered throughout the Commonwealth. Several 200-bed emergency hospitals are in storage, and the program of procurement of additional hospitals continues. These hospitals are for emergency use only and are to be operated where required, as they are mobile. It is planned to conduct them in existing hospitals or in new schools which seem to be peculiarly adapted to their operation. Two hundred and thirty-one of these hospitals are slated for storage.

The Medical Services has secured and stored $1,500,000 worth of emergency medical supplies, including emergency equipment for procuring blood. Equipment for testing radioactivity of air, food, and water has been purchased, but the Radiac Service is no longer a part of the Medical Services. An extensive training program is in progress for personnel to be attached to Civil Defense hospitals, first-aid stations, and in other categories required in fulfilling the responsibilities of the Medical Services. Over 500,000 persons in Massachusetts have had their blood typed under the Massachusetts Civil Defense Agency Blood Typing Program, which has been carried out under the auspices of the Institute of Laboratories.

Numerous committees of outstanding men and women in the medical, nursing, and other professions are in existence, their function being to advise on problems peculiar to civil defense.

The activities of the service are numerous and complex and require a continuity in planning and training to meet the problems that would arise out of an enemy attack or in the case of natural disaster of a magnitude sufficient to require the resources of the Massachusetts Civil Defense Agency and the Medical Services.

DIVISION OF MATERNAL AND CHILD HEALTH SERVICES

Maternity Care

The maternal mortality rate in Massachusetts varied between 3.3 and 5.5 per 10,000 live births during 1950 to 1954. However, the maternal mortality study carried on jointly by the Department and the Massachusetts Medical Society since 1937 still shows a significant number of maternal deaths to have been preventable. Hemorrhage, toxemia, and anesthesia continue to be the leading causes of preventable deaths of Massachusetts mothers.

Efforts to reduce maternal mobidity and mortality in Massachusetts were directed primarily toward improvement of all aspects of prenatal care through assistance given to practicing physicians, nurses, nutritionists, and social workers. This assistance was offered in the following ways: through providing discussions by visiting consultants with practicing physicians at their regular hospital staff meetings, through seminars and institutes on maternity care for each of the above-mentioned professional groups, and through conferences on total maternity care for groups of supervisory personnel representing all these disciplines.

Seminars, institutes, and conferences were organized and sponsored in cooperation with the Massachusetts Medical Society, schools of nursing and of social work, the Harvard School of Public Health, hospitals, and the Children's Bureau. Courses in maternal care were given for physicians at the Boston Lying-in Hospital over a five-year period and were attended by some 650 doctors. Similar courses at Simmons College were attended by 102 registered nurses. Those given at the Boston Lying-in Hospital were attended by 154 nurses representing 65 hospitals, 20 visiting nurse associations, and two boards of health. Scholarships at the Harvard School of Public Health were given to three physicians for a course in maternal and child health. Scholarships in maternity nursing were provided to 14 nurses at Boston University. Through this Division, by means of special appropriation from the Children's Bureau, the Department continued to assist in the support of teaching programs in maternity and infant care at Boston University and in maternal and child health at the Harvard School of Public Health. Consultation was provided to several prenatal clinics by the Assistant Director and Maternity Nursing Consultant, and they assisted in the organization and conduct of a demonstration parents' class in Northampton in cooperation with that community's physicians, Visiting Nurse Association, and hospital.

Among the publications prepared during these years in which the Division was directly or indirectly concerned was a guide for *Organization and Conduct of Prenatal Clinics*, revised in 1950 and distributed through the district health offices. In 1955, the Committee on Maternal Welfare of the Massachusetts Medical Society prepared *Minimum Standards for Prenatal Care*. In addition, a useful *Bibliography on Maternity and Infant Care* was revised, and prenatal and postnatal letters were distributed on request to approximately 64,000 Massachusetts mothers.

Legislation of concern to the Division which was sponsored by the Department included an Act to Further Regulate the Filing of Notice of Intention of Marriage and the Issuance of Certificates of Such Filing, an Act to Require Reports of Births Occurring in Airplanes, passed in 1950, and an Act to Require Hospitals to Determine Blood Type of Patients, passed in 1955.

Infant Care

Since 1950 the birth rate has continued to rise. In 1954, when 107,086 live infants were born to Massachusetts residents, the rate was 22.1 per 1000 population. More than 99 per cent of these babies were born in hospitals. About 7 per cent of infants born in Massachusetts are pre-mature, and one of every five dies during the first week of life.

The infant mortality rate has not decreased appreciably in recent years. The rate per 1000 live births in 1949 was 24.4, and in 1954, the last year for which rates are available at present, it was 23.3. Because the principal cause of infant deaths is prematurity, the Division stressed services aimed at reducing the incidence of prematurity and improving the survival rate of these infants. Its program included

the support and administration of postgraduate training and the provision of consultation service.

Twelve teams of pediatricians and nurses, supervisors of premature units, attended institutes on the care of premature infants sponsored by the New York State Department of Health and the Children's Bureau. Hospitals which sent teams were St. Luke's Hospital of New Bedford; St. Vincent's, Hahnemann, and Worcester City hospitals of Worcester; the Mercy and Wesson hospitals of Springfield; St. Luke's Hospital of Pittsfield; the Boston City, St. Margaret's, and New England Center hospitals of Boston, and the Cambridge City Hospital. In addition, a team from the Department attended such an institute.

Seminars on prematurity were conducted in a number of hospitals throughout the Commonwealth upon request of their respective medical staffs. About 400 physicians, 100 nurses, and 20 hospital administrators attended these seminars. Two nurses were sent to Los Angeles for a refresher course in care of the premature infant. The Maternity Nurse Consultant continued to organize and supervise conferences on this subject for groups of nurses throughout Massachusetts.

The Assistant Director and Maternity Nurse Consultant served as consultants to hospitals having a maternity service in relation to techniques of care of the maternity patient and newborn infant, especially the infant prematurely born. Also, consultation was given in cooperation with the Division of Hospital Licensing in respect to new maternity units under construction and old units being remodeled.

Other activities in this area included preparation of a pamphlet, *C/O Your Baby*, which was distributed in addition to pamphlets available from the Children's Bureau. In keeping with previous activities, financial support was provided 21 well baby clinics throughout the Commonwealth.

The "Premature Law" was revised in 1949 and further amended in 1955. The change in 1955 raised the weight criterion for financial assistance from 4½ to 5 pounds. Reporting of births of premature infants to boards of health is still incomplete. It is more complete from larger hospitals. Also, their reporting of infants of 4½ pounds or less at birth is more complete than that of heavier premature babies. For example, in 1955, when 87 per cent of prematures were so reported, 94 per cent of infants weighing 4½ pounds or less were reported, in contrast to 76 per cent of those weighing over 5 pounds. That the financial assistance provided for the hospital care of these infants has been considerable may be seen in Table I.

TABLE I

Payments for Hospital Care of Premature Infants by Community Boards and Departments of Health and the Massachusetts Department of Public Health

Year	No. of Cases	Total Cost
1950	608	$165,998
1951	593	155,557
1952	607	180,734
1953	680	180,129
1954	646	176,695
1955	698	190,103

PRESCHOOL CARE

Well-Child Conferences — Following demonstration of the value of well-child conferences, 161 communities have organized such clinics. We have assisted many of these conferences to establish and maintain standards, and in 40 communities have also provided financial assistance. In seven of these conferences, held in Hanson, Mattapoisett, Norton, Mansfield, West Bridgewater, Westport, and Attleboro, vision and hearing tests were given to a total of 547 children. As a result of community participation, these conferences now request only occasional consultation support from the Department. In addition to these services, the Department has cooperated with the Harvard School of Public Health in promoting courses given each year for physicians who wish to learn more about health supervision of well children.

Day Care — In 1950, legislation was revised concerning board of health licensing of non-public agencies giving day care to young children. Boards of health were circularized to determine the number and location of these agencies in 1951 and again in 1952. In 1951, 429 centers were reported by 128 communities. In 1952, 869 such agencies were reported by 185 towns. At that time, 307 agencies were reported by Massachusetts' 17 largest communities. However, it is not to be supposed that such agencies occur only in the larger centers of population, for they appear as regularly in our smallest communities. Effort has been made to encourage and assist communities in establishing rules and regulations and standards for their licensure.

Through the Committee on Day Care Standards and Licensing Procedures of the United Community Services of Metropolitan Boston, and in cooperation with the Associated Day Care Services of Metropolitan Boston, the Massachusetts Departments of Education, Mental Health, and Public Welfare, and the United Community Services of Metropolitan Boston, two pamphlets, *Recommended Minimum and Preferred Standards for Agencies Giving Day Care to Children Under Seven Years of Age* and *Your Child Deserves the Best in Day Care, a Pamphlet for Parents*, were prepared and widely distributed to public and private agencies within the spheres of influence of all the organizations sponsoring these pamphlets. The first pamphlet was intended to assist boards of health which license private day care agencies for preschool age children. The second was developed to assist parents in choosing an appropriate private nursery school, kindergarten, or day-care center. These pamphlets have been well received elsewhere in the country and widely distributed on request of other state and private organizations concerned with the field. This committee has continued to work to the end of good standards for the daytime care of the preschool child apart from his home.

In 1955, the Metropolitan Boston Health Officers Association and the Boston Association for Nursery Education formed a Joint Committee on Day Care for the purpose of assisting communities with problems in respect to these agencies. This committee has set up a consultation service of experts in the field of early childhood education whose services have been made available to boards of health, and has been instrumental in effecting a course to be offered for licensing personnel.

Conservation of Hearing and Vision

Until 1950, very little assistance and very few services were available for handicapped children of preschool age. The immediate result was that many preschool children with severe hearing losses did not have the opportunity to learn speech during the preschool period, which is, from a developmental standpoint, the most favorable time for this type of learning. Another result of this deficiency was that preschool children with impaired hearing were in no position to become habilitated at the public school level when they became of school age.

In 1951 a preschool hearing center for hard of hearing and deaf children was established in Pittsfield. This nursery school was set up in cooperation with local agencies, professional personnel, and the parents of hard-of-hearing children. Since the establishment of this center, eight others have been organized: Taunton, Waltham, and Watertown in 1952; Quincy in 1953; Lowell in 1954; Boston and Salem in 1955; and Fitchburg in 1956. These nursery schools were equipped with the finest auditory training equipment, toys, medical consultation, and teaching staff. The teachers worked with both children and parents on a program of auditory training, lip-reading, rhythm exercises, and speech training. Parents played a key role in the therapy and were encouraged to undertake a definite educational role in the day-to-day strengthening of the children's impairments. One of the key objectives of the training was to prepare children for entrance into public schools whenever possible rather than institutionalizing them in schools for the deaf.

The nurseries for impaired children have proved quite successful, and it is believed that many children have had their lives materially altered for the better as a result of the training which they have received at these installations.

Another important addition to the services given by the Child Growth and Development Section is the auditory training program. Under this program, complex

electronic auditory trainers are installed in the homes of hard-of-hearing and deaf children. In many cases this amplifying equipment enables the child to hear the voices of his parents and brothers and sisters for the very first time. The auditory trainers are sometimes connected to the family television set so that the impaired child may improve in his lip-reading abilities and at the same time derive recreation and enjoyment from appropriate programs. The extensive use of auditory training procedures in the home and in our nursery schools points the way, in many instances, to the early acceptance of a hearing aid and ultimate habilitation at the public school level. Through these methods the child with a hearing handicap is literally bathed in sound from his very earliest years and thus makes the best possible use of his residual hearing.

Field reports from parents and educators on the value of our nursery schools and auditory training program have thus far been uniformly favorable. Both the speech and the speech reception of hard-of-hearing and deaf children enrolled in these programs have improved markedly during the course of training.

For many years preschool children and school children who had hearing losses sufficient to warrant the use of a hearing aid were not able to obtain one. However, in 1954 the Legislature appropriated a small sum of money which was designated for use in purchasing hearing aids for hard-of-hearing and deaf children. This section was thereupon required to establish procedures to insure adequate case finding, the economical purchase of hearing aids, and the fair and adequate geographical coverage among recipients. The Section also was required to provide for efficient methods for instructing the recipients of hearing aids in the proper use of the equipment and to provide for the proper maintenance of equipment. The initial program met only a small part of the acute needs of hard-of-hearing and deaf children throughout the Commonwealth. So great was the need that by October of 1954 the complete appropriation for hearing aids had been exhausted. Fortunately, the Legislature has seen fit to increase subsequent appropriations for hearing aids, but available funds are still lacking to meet the needs of all our children.

Experience gained in the first years of the hearing aid distribution program has proved invaluable. In the second year of operation, the purchase price of each aid was limited to a maximum of $120, since in the great majority of cases a satisfactory hearing aid can be purchased for this price. All recipients of hearing aids must be evaluated at the Winthrop Foundation at the Massachusetts Eye and Ear Infirmary, the Hearing Clinic at the Children's Medical Center, or the Clarke School for the Deaf at Northampton.

The State-wide hearing conservation program has continued its steady growth. With the exception of relatively few towns, all the cities and towns in the Commonwealth have received assistance in developing and expanding their school hearing conservation programs. In most instances these programs meet the requirements of State health regulations which govern such activities. In the matter of equipment, there are now almost 300 modern electronic audiometers owned and used by the schools throughout the Commonwealth. Local testing personnel are now being trained at the rate of about 200 testers per year.

The work which this section is doing has been recognized throughout the country. For example, supervisors of the hearing conservation programs from Georgia, California, Rhode Island, and Texas have visited this Division to learn more about our program.

The Massachusetts school vision conservation program has also expanded greatly in this seven-year period. At the present time practically all cities and towns are using the Massachusetts Vision Test for screening school children. Over 400 approved Massachusetts Vision Test units are owned by cities and towns throughout the Commonwealth. Every community in the State has one or more local persons who have been given training in test procedures by personnel from the Child Growth and Development Section. The annual rate of training school personnel in these techniques is also currently running at the rate of 200 testers per year. A large number of visitors from other states come to Massachusetts annually to see our school screening system in operation and to investigate various other phases of our vision and hearing conservation programs.

School Health

The school health work of this Division has not been adequate so far as consultation is concerned, as we have had a physician in charge of this program for less than four years; that is, from September 1950 through April 1954.

In 1952, legislation was passed requiring every child in the public schools to be "separately and carefully examined in such manner and at such intervals . . . as may be determined by the Department of Public Health after consultation with the Department of Education and the medical profession."

In-service training courses in school health education have been given at the following State teachers colleges: Worcester (two courses), Framingham (two courses), Fitchburg, Lowell, Bridgewater (three courses), North Adams, and Salem. Teacher training courses were also given in cooperation with Springfield College (two courses) and Boston University (four courses). Also, in cooperation with Harvard-Boston University Extension Division, courses were given in Worcester, Lowell, and Danvers. Summer school health workshops were conducted at Boston University and the University of Massachusetts.

Two Teacher School Health Institutes have been held for the Archdiocese of Boston, in Cambridge and in Quincy. In addition, throughout the State, local in-service training of teachers and evaluation studies of school health programs were given to local schools. The Department also cooperated in a pioneer demonstration for the in-service training of teachers in Mental Health.

In 1951 the Department was authorized by the Legislature to draw up new regulations for the physical examination of school children. A new health record card was devised, and regional conferences were held for school superintendents, physicians, and nurses at which the current regulations were described.

Beginning in 1955, a new series of regional workshops in the administrative aspects of school health services was instituted in cooperation with the School Health Council. This Council, formed in 1940, coordinates the activities of the Departments of Public Health, Mental Health, and Education in the area of school health and advises the respective commissioners on matters of policy in this field.

As another project of the School Health Council, the former School Health Manual has been rewritten under the title *An Administrator's Guide to the School Health Program.* In connection with this new publication, the Coordinator of School Health has been the coordinator and editor.

Services for Crippled Children

Analysis of the statistics for the seven-year period covered by this report shows a steadily increasing service to crippled children in Massachusetts. During this period a total of 30,059 clinic visits were made in the twelve orthopedic and two plastic clinics, in contrast to 16,923 clinic visits during the previous seven years.

The number of new cases admitted to Services for Crippled Children increased from 906 in 1949 to 1,120 in 1955. The number of active cases increased from 1988 as of January 1, 1949 to 3447 as of December 31, 1955.

During the past seven years the clinic load has increased to such an extent that it has become necessary to have more than the allotted eleven monthly orthopedic clinic sessions per year. Two orthopedic consultants were assigned to the Haverhill and Fall River clinics. Other clinics scheduled extra sessions as needed to accommodate the increased case load.

In 1952, a State-wide children's cardiac program was started. Under this program, children with congenital malformations of the heart or other cardiac conditions which might be benefited by surgery may receive diagnostic services and/or cardiac surgery if recommended.

The cost of hospital care for crippled children hospitalized has increased from a maximum all-inclusive per diem of $14 paid up to January 1, 1954, at which time a per diem rate based on hospital costs became effective. The total hospital days of patients hospitalized by Services for Crippled Children was 12,928 in 1949 and 17,928 in 1955.

Treatments given by physical therapists increased from 4,090 for the year 1949 to 6,807 for 1955. This increase was made possible by the establishment of treatment centers where more children could be treated than by making home visits on each child.

Yearly statistics for the period covered by this report are shown in Table II.

TABLE II

Services for Crippled Children, 1950–1955

Orthopedic

Year	Clinic Visits	Case Load	New Cases	Old Cases
1950	3567	2096	685	1411
1951	3576	2190	653	1537
1952	3984	2354	646	1708
1953	4028	2530	702	1828
1954	4498	2647	677	1970
1955	4660	2796	693	2103

Rheumatic Fever

Year	Clinic Visits	Case Load	New Cases	Old Cases
1950	933	352	193	159
1951	937	403	172	231
1952	827	404	125	279
1953	790	430	146	284
1954	713	429	125	304
1955	739	481	162	319

Plastic

Year	Clinic Visits	Case Load	New Cases	Old Cases
1950	271	192	55	137
1951	297	205	41	164
1952	402	242	58	184
1953	425	280	55	225
1954	476	302	68	234
1955	509	325	64	261

Congenital Heart

Year	Case Load	Days Hospital Care
1952	23	265
1953	40	535
1954	54	377
1955	67	682

The responsibility of the Department of Public Health in relation to the Annual Census of Physically Handicapped Children and the Home Teaching Program continues to be carried in the Division of Maternal and Child Health Services under the direction of the Supervisor of Clinics, Services for Crippled Children. Activities in the discharge of this responsibility include:

(1) Consultation to the Department of Education and local school personnel on the health, medical and social needs of handicapped children; evaluation of the need for certain children to receive education through home instruction rather than in regular public school classes, or in special schools or classes; and the determination that all handicapped children are having needed medical care. The consultation services to local school personnel and other agencies are given under the direction of the district health officers by the Public Health Nursing and Social Work Supervisors in the health districts. In the seven-year period covered in this report, an average of 1807 children a year received instruction at home, in hospitals or convalescent homes.

(2) The maintenance of a register of physically handicapped children, under 21 years of age, known to the Department. Sources of information for the register, in addition to the Annual Census of Physically Handicapped Children, include reports of infants with congenital deformities, children served by the State Crippled Children's Clinics, and those reported by other state and private agencies serving handicapped children.

Number on Register, December 31, 1949		29,347
Number of orthopedically handicapped	17,165	
Number of non-orthopedically handicapped	12,182	
Number on Register, December 31, 1955		36,157
Number of orthopedically handicapped	21,762	
Number of non-orthopedically handicapped	14,395	

In December, 1954 the Director of the Division of Maternal and Child Health Services, with the approval of the Commissioner, appointed a committee to study the needs of crippled children in the State. The report of the committee, submitted on May 12, 1956, contained general information and tables showing the work and growth of the Crippled Children's Program during 1949 through 1954, a statement of diagnostic categories not served by Services for Crippled Children, and a summary of those additional categories which the districts reported should be covered. The report showed the very considerable volume of work being done by district personnel as part of these services. The report included recommendations for immediate improvement of the program and for long-range planning for improved services.

Statistical Services

The statistical section of the Division collected and analyzed statistics on the various aspects of the maternal and child health and crippled children's programs. These statistics have been of value not only to the staff of the Division but also to other members of the Department and to research workers studying the problems of the mother and the child.

Legislation

During this seven-year period, laws were passed covering the following phases of maternal and child health and crippled children's services.

Maternity

Chapter 113 (1950)	Premarital Blood Test
Chapter 232 (1954)	Paternity via Blood-Grouping Tests
Chapter 449 (1955)	Hospitals to Determine Blood Type of Certain Patients

Infant

Chapter 72 (1952)	Recording of Birth Certificate in Town of Residence if Infant is Born out of State or out of U. S.
Chapter 753 (1955)	Prematurely-born Infants (Amendment to Chapter 601 (1949).)

Preschool

Chapter 205 (1950)	Child Care Centers and Day Care Centers
Chapter 673 (1951)	Assistance for Blind Children
Chapter 492 (1952)	Care at Lakeville State Sanatorium for Children with Arthritis

School Age Child

Chapter 89 (1951)	Infectious Diseases in Children
Chapter 342 (1952)	Expenses of T & A Operations Paid by Local Welfare Departments to Be Reimbursed by State Department of Public Welfare
Chapter 304 (1953)	Use of School Buses for Transportation to Certain Educational or Recreational Projects
Chapter 352 (1953)	Transportation of School Children with Cerebral Palsy
Chapter 383 (1953)	Care of Children with Muscular Dystrophy at Lakeville State Sanatorium
Chapter 508 (1954)	Transferring the Massachusetts Hospital School and Hospital for State Minor Wards to the Department of Public Health
Chapter 514 (1954)	Instruction for Mentally Retarded
Chapter 113 (1955)	Employment under 16 Years of Age

Special Projects

Several new projects were introduced during this period. They included the Greater New Bedford Children's Accident Prevention Program, Poison Information Center, Special Project for Providing Intensive Medical Care to Women with Abnormal Carbohydrate Metabolism in Pregnancy, and Epilepsy Training Program. Support was afforded all of them save the first-mentioned by means of funds from the Children's Bureau for special projects.

Greater New Bedford Children's Accident Prevention Program — This program involved not only provision of service but also study of methods of community cooperation between public and private agencies in establishing a program to prevent childhood accidents at home, at school, and elsewhere in the child's environment.

Its objective was to demonstrate the value of such a specific program for prevention of accidents to children. It was carried on for four years, and supported in part by the Charles H. Hood Dairy Foundation.

Poison Information Center — In cooperation with the Children's Medical Center, the Boston Floating Hospital, the Boston City Hospital, the New England Chapter of the American Academy of Pediatrics, the Massachusetts College of Pharmacy, and the Department of Legal Medicine of Harvard Medical School, a program was established to assist physicians in the care of their child patients who have been poisoned. Material concerning the incidence of poisoning among children, the types of poisons involved, and the most effective treatment for each type of poisoning has been made available to physicians throughout the Commonwealth. A Poison Information Center was established in the Children's Medical Center, from which physicians receive information concerning the ingredients of potentially poisonous compounds commonly ingested by children and the current method of treating these patients if the compound contains a poisonous substance.

Medical Care for Pregnant Women — This project was established to provide intensive and comprehensive medical care, including dietary therapy and insulin where necessary, for pregnant women having abnormal carbohydrate metabolism. It was carried out at the Boston City Hospital and the Boston Lying-in Hospital. The principal objectives were to prevent fetal wastage, certain complications of pregnancy, and maternal deaths; to decrease the chance of diabetes occurring in infants born to mothers with abnormal carbohydrate metabolism during pregnancy, and hopefully to delay the onset of diabetes in later life in women who demonstrated abnormal carbohydrate metabolism during pregnancy.

Epilepsy Program — An epilepsy training program was established through the Seizure Unit, Children's Medical Center, for physicians and technicians. It has been estimated that at least one of every 200 persons suffers from epilepsy. The number of physicians especially qualified to treat epilepsy is relatively small. Also, there is a dearth of technicians qualified to make electroencephalogram tracings. Dr. William G. Lennox is in charge of this program. The training course for physicians and technicians is for a period of one to three months and includes both didactic and clinical training. In 1952, 10 physicians and 11 technicians were trained; in 1954, the number was seven physicians and 13 technicians.

Training in Maternal and Child Health — Financial support was continued for courses in maternal and child health services and in administration of maternal and child health programs at the Harvard School of Public Health. During the year 1955–1956, 18 students in the basic course in maternal and child health came under this program and there were an additional eight students in the course on administration. During these years, modifications and adaptations of this program have been made as experience has shown them to be necessary. There has been an expansion of the staff, a broadening of facilities available for field observation and studies, and an intensification of teaching of students who are majoring in maternal and child health services. There has been increasing use of case material from clinical and public health resources, for example the family clinic. In addition, one fellowship in maternal and child health services was given annually to a qualified physician at the Harvard School of Public Health.

Other Training Programs — The maternity and pediatric nursing courses were continued at Boston University, and scholarships in pediatric nursing were given through the Boston University School of Nursing in cooperation with the Children's Medical Center. In 1948, the Medical Social Work Training Project was established in cooperation with the three schools of social work in Boston: Simmons College, Boston University, and Boston College. The Medical Social Work Faculty at the Harvard School of Public Health has also cooperated in this project. Through this course, 20 students have received this special training. During these years, fellowships in rheumatic fever and in pediatric cardiology were provided in cooperation with the Children's Medical Center, the House of the Good Samaritan, and the Harvard Medical School.

Publications

During this period, ten publications were made by this Division.

BUREAU OF PREVENTIVE DISEASE CONTROL

DIVISION OF CANCER AND CHRONIC DISEASE

The activities that constitute public health programs vary according to time and place. In some parts of the world sanitation of the environment must still have the most important role, while in many health departments a major part of the time is even now devoted to the control of communicable disease. In areas such as Massachusetts, emphasis is being placed more and more on the control of chronic disease. The reasons for this change are obvious. The population is growing older. In 1850, 6.2 per cent of the Massachusetts population was 60 years of age or over. Half a century later the percentage was 8.0; in 1930 it had reached 14.6, and an estimate of the present percentage is 16.0 per cent. The causes of death have changed markedly. At the turn of the century, diabetes, apoplexy, heart disease, cancer, and nephritis accounted for slightly less than 20 per cent of all deaths, while at the present time these conditions account for about 70 per cent of all deaths.

A complete chronic disease control program is a blending of administration, service, and epidemiology. The weight given to the component parts may vary from state to state, but these parts are still present to some degree in all programs. Massachusetts allots great weight to epidemiology. Here, the possible relationship of the various sites of cancer to such factors as heredity, habits of living, occupation, and other environmental hazards are studied with the objective of adding to the sum total of knowledge regarding these diseases.

The epidemiological work done by the Division has been recognized by the Rockefeller Foundation, the Commonwealth Fund, the American Cancer Society, and the Public Health Service, all of which have given special grants over the years for this type of work.

The work of the Division of Cancer and Chronic Disease is divided into four component parts: cancer control, heart disease control, control of other chronic diseases, and an incipient geriatric program.

Thirtieth Anniversary

In the spring of 1956, the Division celebrated the 30th anniversary of the Massachusetts Cancer Program. Thirteen clinics prepared special programs for this occasion, either in the form of a teaching clinic or a cured cancer clinic. The Division published a booklet highlighting important events over the period:

1926 — An Act to Promote the Prevention and Cure of Cancer and the Extension of Resources for Its Cure and Treatment — approved May 29, 1926.

The first cancer clinic opened in Newton, December 17, 1926.

Tumor Diagnosis Service integrated into the Massachusetts Cancer Program.

1927 — The following cancer clinics opened during the year:

Lowell	Pondville
Lynn	Springfield
Worcester	

Pondville Hospital opened — capacity 90 beds.

1928 — The following cancer clinics opened during the year:

Berkshire County	Franklin County
Boston Dispensary	Lawrence
Fitchburg	New Bedford

First annual meeting of the cancer clinic chiefs and the social workers.

1929 — Three-day graduate course in cancer for physicians. Division of Adult Hygiene established. (Changed to Division of Cancer and Other Chronic Diseases in 1945, and to Division of Cancer and Chronic Disease in 1955.)

1930 — Brockton Cancer Clinic opened.

1932 — First Cured Cancer Clinic.
Achievement Week.

1933 — The book *Cancer and Other Chronic Diseases* was published. This was the culmination of a four-year study of the chronic disease problem in Massachusetts.

1935 — Cooperative Cancer Control Committees were first organized. (This activity continued until 1948.)

1935 — Pondville Hospital enlarged — capacity 147 beds.
The following cancer clinics opened during the year:

Beth Israel	Greenfield
Gardner	Newburyport (discon. in 1942)
Gloucester	North Adams

Northampton (discontinued in 1939)

1936 — Cape Cod Cancer Clinic opened (discontinued in 1947).

1937 — Monsignor Roche House for cancer opened at the Westfield State Sanatorium.
Fall River Cancer Clinic opened.
Westfield Cancer Clinic opened.

1938 — Salem Cancer Clinic opened.

1939 — Beverly Cancer Clinic opened.
Quincy Cancer Clinic opened.

1940 — *Cancer, A Manual for Practitioners*, first edition, was distributed to every practicing physician in Massachusetts. (A second edition was distributed in 1950, and a third in 1956.)

1944 — Cancer education was introduced into the Massachusetts schools.

1948 — The American Cancer Society, Massachusetts Division, Incorporated, assumed the major part of the responsibility for cancer education of the laity.

1954 — The George H. Bigelow Building opened at Pondville Hospital.
The Mount Auburn Hospital Cancer Clinic opened.

1955 — The following cancer clinics opened during the year:
Cambridge City Hospital
Free Hospital for Women
Massachusetts Memorial Hospitals

1956 — Boston City Hospital Cancer Clinic opened.

Epidemiology and Biometrics

Cancer of the Lung

The major epidemiological activity of the Division of Cancer and Chronic Disease dealt with cancer of the lung. The Division, in conjunction with Dr. Leonid S. Snegireff of the Cancer Control Unit, Harvard School of Public Health, has been studying this problem since 1950.

A first report on this study was published in *Cancer*, July–August, 1956. The final report will be published as a Harvard Monograph.

The major findings are as follows:

1. The disease is increasing at a far greater rate than any other form of cancer.
2. The total adjusted rate for males is increasing faster than that for the females, but in the older age groups the difference is not significant.
3. An excessive amount of lung cancer has been observed in some occupational groups, and it is probable that a certain percentage of the cases are related

to occupation. However, our lung cancer data, which included all occupations throughout the lifetime of the individual, did not furnish proof that occupation was of major importance.

4. Individuals with chronic and/or frequent respiratory conditions appeared to have more lung cancer than the remainder of the population.
5. Individuals whose work was wholly outdoors had a higher rate than those whose work was partially outdoors. This latter group, in turn, had a higher rate than those individuals who worked wholly indoors.
6. Individuals using an excessive amount of alcohol had higher rates than those who did not.
7. There appeared to be slightly more lung cancer among city dwellers than among those living in the country, but the data did not show consistency. The combined counties of Barnstable, Dukes, and Nantucket had a higher adjusted rate than the cities of Springfield and Worcester, but the combined counties were slightly lower than Boston.
8. Cigarette smoking was found to be the most outstanding variable in the study. The lifetime cigarette smoking habits of individuals with lung cancer and of the controls were estimated and computations made on the basis of the number of years the individual smoked 1 package of cigarettes per day (for example, the individual smoking 3 packages of cigarettes per day for one year would be considered equivalent to an individual smoking 1 package of cigarettes per day for three years). It was found that there was very little lung cancer among individuals smoking the equivalent of 1 package of cigarettes per day up to 20 years. However, the increase became rapid after 25 years and the individual who had smoked the equivalent of 1 package of cigarettes per day for 55 years or more had 10 times as much lung cancer as those individuals smoking 1 package of cigarettes per day for less than 25 years and about 30 times more than those who never smoked. Very few women were found who had smoked the equivalent of 1 package of cigarettes per day for as long as 25 years.

Health Protection Clinic Demonstration

The health protection clinics demonstration was one effort to evaluate more screening to detect chronic disease. Between December 1, 1949 and June 30, 1952, over 9000 people were screened. An extensive history was taken; hemoglobin, blood sugar analysis, visual test, hearing test, x-ray of the chest, height and weight, blood pressure, and physical examination were offered throughout the demonstration. In the latter part of the demonstration, electrocardiograms and vaginal smears were done routinely. Since a screening cannot be expected to detect every diagnosable condition, the findings in the study were satisfactory. The demonstration revealed that such a screening program was too costly and indicated that some of the tests should be omitted in a service program.

Three papers were published regarding this project: "The Evaluation of a Pilot Clinic," *New England Journal of Medicine*, September 25, 1952; "The Cost and Evaluation of Multiple Screening," *New York State Journal of Medicine*, November 1, 1952; "Multiphasic Screening; What is It? What are the Advantages?" *Transactions* of the 58th Annual Meeting of the National Tuberculosis Association, May, 1952.

Cancer Detection Center

An evaluation of a cancer detection center was made, supported in part by a grant from the Public Health Service. Among the conclusions drawn were the following:

The small number of cancers found among asymptomatic subjects would have been greatly increased if applicants with symptoms had been accepted by the Center.

The place for examination of persons with symptoms is the private physician's office or a cancer diagnostic clinic, rather than a detection center.

The few cancers found among asymptomatic persons, as well as the high cost of each examination, precludes large-scale financing of cancer detection centers by either governmental or voluntary agencies.

Many of the procedures carried out at the detection center probably could be done by the general practitioner if proper instruments were available to him at a reasonable cost and if he were willing to spend sufficient time in taking a history and making an examination.

A report of this demonstration was published in the *New England Journal of Medicine*, November 2, 1951.

Cancer of the Buccal Cavity

A study of the etiology of cancer of the mouth is being conducted by the Division and by Dr. Harry Harding, consultant dentist at the Pondville Hospital. A thorough oral examination is made on all patients and a careful epidemiological history is taken to uncover possible causative factors.

Diabetes Self-Testing Study

A study was carried out in Gloucester to determine the extent to which a community would participate in self-testing of urine as a diabetic control measure. The study was under the joint sponsorship of the Medical Staff of the Addison Gilbert Hospital, the Massachusetts Department of Public Health, and the Public Health Service. The study showed that a community will participate in a self-testing program where there is concerted action on the part of local groups. However, 41 per cent of those who obtained the kit free of charge failed to use it, and many others whose tests had been positive failed to consult a physician regarding their condition.

This study was reported in *Diabetes*, the Journal of the American Diabetes Association, May, 1952.

Cancer of the Uterus

In 1950, the result of the study of cervical cancer was published in *Cancer*, November, 1950. This showed that early marriage, early termination of pregnancies, and divorce or separation remained significantly associated with cancer of the cervix. When cancer of the cervix cases were studied in relation to histological classification, the important variables were found to be related to the epidermoid type, and not to the adenocarcinoma group. Cancer in situ, however, showed relationship with early marriage and divorce. These findings were published in booklet form, *The Laboratory Diagnosis of Cancer of the Cervix*, edited by Homburger and Fishman.

Cytology Study

The findings in the cytology study were published in 1950. The incidence of cancer among individuals with no gynecological symptoms was less than 1 per cent. Cancer of the uterus was found in about 30 per cent of individuals with bleeding as a symptom, in about 5 per cent among those with vaginal discharge, and in about 3 per cent of those with other gynecological symptoms.

This study was reported in the *New England Journal of Medicine*, April 3, 1952.

The Chronic Disease Survey in the Brookfields

The chronic disease survey, conducted in the four Brookfields, included questions regarding heredity, occupation, living conditions, habits, and chronic diseases. The personnel were furnished by the Division, while the traveling expenses were supplied by Harvard University, utilizing a special grant for this purpose from the American Cancer Society. That part of the data pertinent to the incidence of chronic disease was reported by Lombard and Quinn in *Commonhealth;* that part regarding heredity, occupations, living conditions, and habits is to be utilized in the rural control phase of the lung cancer study.

Evaluation of Cancer Education

The results of two evaluation studies on cancer education were reported during this period, one in the *Massachusetts Health Journal*, May, 1950 and the other in the *Bulletin of Cancer Control*, July, 1954. These studies furnished an estimate of

the public's knowledge of the public health aspects of cancer, and the later one gave some indication of improvement that had taken place in the city of Waltham.

Cancer of the Prostate

An article on "Epidemiology of Cancer of the Prostate" was prepared and published in a monograph, *The Laboratory Diagnosis of Cancer of the Prostate*, Homburger and Fishman. This included a review of the literature on the subject and end results from the Massachusetts Cancer Clinics, which showed a great improvement in five-year survivals during recent years.

Epidemiological Consultation

All research papers prepared by Pondville and Westfield physicians which contain statistics are reviewed by this Division to determine the statistical soundness of the conclusions. In addition, many physicians throughout the State are requesting that papers prepared by them be verified statistically.

Statistical Articles

Inasmuch as from statistical studies the Massachusetts Cancer Program received its inspiration, determined its scope, evaluated its activities, changed its policies, and obtained new ideas for cancer control, the Director of this program has been asked on many occasions to discuss this subject.

In 1953, the book *Physiopathology of Cancer* by Homburger and Fishman, was published. One chapter in this book, "Statistical Studies in Cancer," was written by the Director. A paper on statistics in the cancer program was published in 1952 in the *Harvard Public Health Alumni Bulletin*. Two articles appeared in the proceedings of the Second National Cancer Conference, 1952, published by the American Cancer Society, and a review of the statistical work of the Division appeared in *Public Health Reports*, published by the United States Department of Health, Education, and Welfare ("Twenty-six Years of Cancer Control," July, 1953).

Services

Cancer Clinics

The cancer clinics have had phenomenal growth within the past six years. Due to the efforts of Representative Rico Matera, additional funds were obtained which enabled the Division to open new clinics and reactivate others. As of July, 1956 there were 25 State-aided cancer clinics and two State cancer clinics. In 1955, the unit payment values were changed in order that services offered in State-aided cancer clinics might be extended and improved. During the six years represented by this report 27,756 new patients attended the cancer clinics. An average of over 24,000 patients made return visits to the clinic each year.

Traditionally, the clinics furnish group diagnosis for any individual in Massachusetts who is suspected of having a cancerous or precancerous condition. Approximately 85 per cent of patients attending the clinics are referred by practicing physicians who utilize the diagnostic facilities of the clinics to confirm their own diagnoses.

Tumor Diagnosis Service

A tumor diagnosis service is maintained by the Department of Public Health in conjunction with the Cancer Commission of Harvard University. Any physician or hospital may have suspicious tissue examined pathologically to determine the presence or absence of cancer. This service is used by physicians, many of whom have no other pathological service available, and by pathologists who confirm diagnoses in borderline cases.

In 1945, approximately 4000 specimens were examined, and from that time to the present there has been a phenomenal increase in the use of this service until at the present time, over 13,000 specimens are being examined annually.

Education

Professional

Physicians — Cancer education of physicians is accomplished largely through teaching clinics. Physicians who would find it difficult to travel to Boston can easily arrange to spend a few hours attending a local clinic. In practice, the doctor might

see one or two cases in the course of a year, whereas the clinic provides an additional opportunity to see a wide variety of cases and to follow the newer trends in diagnosis and treatment.

In the six-year period, 143 teaching clinics were held, with an average physician attendance of 35.

The second edition of *Cancer, A Manual for Practitioners* was distributed to all practicing physicians in the Commonwealth in 1950, and the third edition in 1956. The following are quotations from the preface of the second and third editions:

"This second edition has been prepared in answer to the continuing demand. The advance in the knowledge of cancer and its treatment has made many sections of the first edition incomplete."

"Cancer detection and therapy have changed significantly in the six years. In this third edition all of the chapters have been revised and several new chapters have been added. This manual has been designed primarily to aid practitioners in the early diagnosis of cancer. It is anticipated that students will find the third edition as useful an educational tool as others have found the previous editions. The accepted methods of treatment have been described, but no attempt has been made to go into details."

A chapter on "The Epidemiological Aspects of Cancer" and a second chapter on "The Cancer Control Program of the Massachusetts Department of Public Health" were included in this volume.

Nurses — Several nurses' institutes have been held. These institutes consist of a concentrated two-week period of instruction and observation at Pondville Hospital, the State-aided cancer clinics, and various institutions. The course includes discussion of the various sites of cancer from the surgical, pathological, radiological, and nursing points of view, and seminars on the public health aspects of cancer control. The number of nurses who may attend the institute is limited in order that each nurse may be given individual attention.

Workers in Biometrics — Due to the scarcity of women trained in biometric procedures, it has been necessary to furnish in-service training. Several courses in biometrics have been given during the six-year period. In two of the courses personnel from the Massachusetts General and the Massachusetts Memorial Hospitals requested permission to attend.

Lay Education

Since 1948, lay education in cancer control has been largely the responsibility of the Massachusetts Division of the American Cancer Society. During the past six years, the Division furnished some pamphlets and provided speakers; in addition, a considerable amount of time was devoted to the evaluation of lay education.

Visitors

During recent years representatives from 26 foreign countries and from 41 states and territories requested information regarding the cancer program. Many visited the Division, others wrote for information.

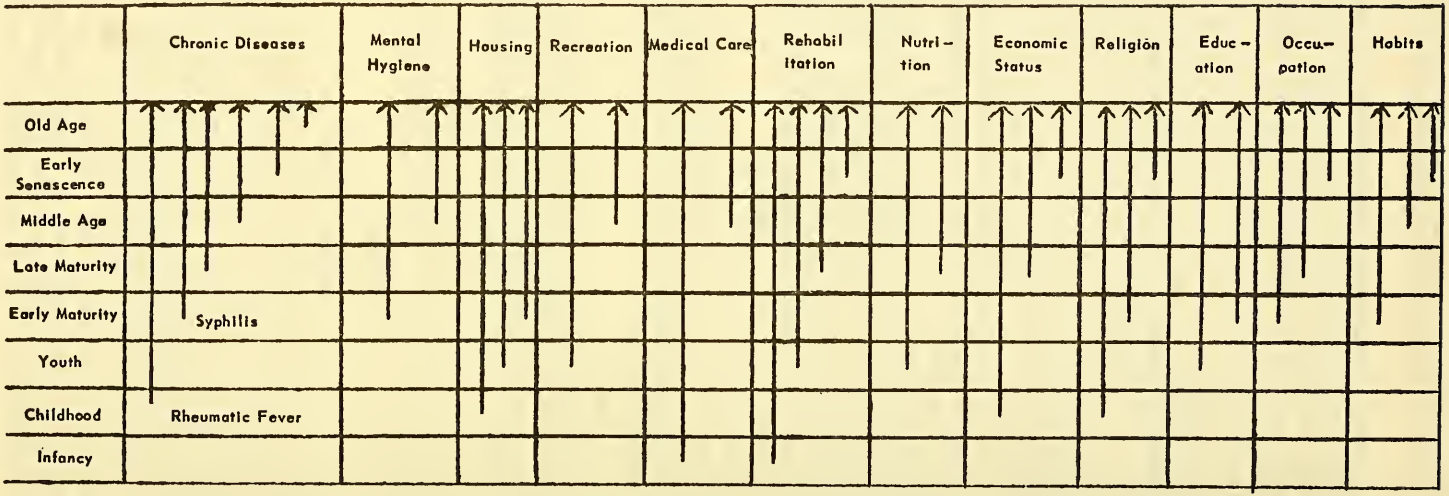
Registration

At the inception of the Massachusetts Cancer Program the policy was adopted that all cancer cases should be followed until death. For 30 years the follow-up of patients has been continuing, and at the present time some of the first-year patients are still living. The percentage of lost cases is extremely low, being in the neighborhood of 2 per cent. This system forms the basis for many of the Division's studies.

Certain sites of cancer have far more cases of cancer than do other sites. It has been possible, therefore, to study extensively the end results of treatment for certain sites, but it has been impossible to study some sites due to the sparsity of cases.

On the national level, the difficulties of determining satisfactory end results are great. Variations in geographical location, classification, selection of cases, and methods of therapy have made it impossible to obtain uniform and comparable end results. The Public Health Service has requested those registries in the United

Diagrammatic Outline of Geriatric Study



States which are reasonably satisfactory to pool their data so that studies can be made that have a national significance, and enough cases to study the rare tumors. The Massachusetts Registry was invited to participate in this endeavor.

Heart Program

The cardiac program as it functions in Massachusetts has stressed services to prevent progression of disease processes and cardiac invalidism, education of professional personnel to stimulate early case finding and improved patient care, rehabilitation services for cardiacs, and epidemiological research.

During the period, vital statistics data were studied to determine the magnitude of the cardiovascular disease problem in Massachusetts. Approximately 58 per cent of all deaths in Massachusetts were attributed to the cardiovascular diseases.

Funds are supplied for six medical social workers who assist patients in carrying out physicians' advice. For the individual with a chronic illness, social and economic problems are greatly magnified, and their solution may often constitute an essential part of the prescribed treatment plan.

Cardiac Work Classification Unit

A pilot Cardiac Work Classification Unit functions under the combined auspices of the Bay State Medical Rehabilitation Clinic, the Massachusetts Department of Public Health, and the Massachusetts Heart Association. The clinic has functioned for four years at the Boston Bay State Rehabilitation Center. The cardiac unit provides a consultation service in cardiac diagnosis and in classification of individuals relative to their capacities for employment, for private physicians, hospitals, clinics, industries, and other social agencies.

Research

Boston Dispensary — Records have been collected for a study of rehabilitation of individuals with heart disease. This important research project demonstrates utilization of maximum rehabilitation services for cardiac patients.

Boston Lying-in Project — A combined service and research program is being given to the Boston Lying-in Hospital to study the effects of heart disease in pregnancy. The provision of supportive services and greater utilization of community resources augment the armamentarium of the cardiologist in preventing cardiac disability associated with the stresses of pregnancy.

Instruction in adapting work-simplification methods to household tasks enables the pregnant cardiac to save 75 per cent of the energy expended, and further aids in the maintenance of cardiac reserve.

Psychological and Social Consequences of Heart Disease — A preliminary study dealing with the social and psychological consequences of heart disease is being conducted in cooperation with the Public Health Service. This is an attempt to determine the effect of social situations, of family, of finances, and of employment on the cardiac.

Lawrence General Hospital Cardiac Clinic — At the Lawrence General Hospital Cardiac Clinic a study is being conducted to demonstrate the value of a cardiac team which is composed of a cardiologist, social worker, public health nurse, and nutritionist. The members of this team are present at each clinic session and each case is reviewed and evaluated by group discussion and participation. In addition to working with the patient in the clinic, care will be extended into the home by each of the team members.

Professional Education

Physicians — Information is furnished to physicians on new discoveries in heart disease, through a bulletin sent to all physicians requesting it. The Department cooperates with the Massachusetts Medical Society in furnishing postgraduate education.

Nurses — Recognizing the need for professional education for nurses in all fields relating to the newer concepts of patient care in cardiovascular disease, the Cancer and Chronic Disease Division undertook to develop such a program. Participants

in the program included physicians, social workers, nutritionists, and nurses. Courses have been completed in the following locations in the state: Andover, Cambridge, Fitchburg, Lakeville, Lawrence, Lowell, Northampton, Pittsfield, Quincy, Salem, Waltham, and Worcester. These courses were from six to eight weeks in duration and the average attendance at a given session was 46. The total number who registered was 892 and there were several who attended who failed to register.

Geriatric Program

Tentative plans for the geriatric program are as follows:

Establishing of a Teaching Clinic for Prospective Workers in Geriatrics — The care of the geriatric patient differs markedly from that of the ordinary patient. Most physicians and nurses are unfamiliar with the best methods for handling this type of patient. The present-day physician is geared to combat the individual disease, and it is necessary for him to learn new techniques in order to give the best care to the geriatric patient. Here, emphasis is placed on the over-all welfare of the patient rather than any one disease entity. Recreation, work, and nutrition may be as important as medication. The geriatric clinic must conduct research into the best way of caring for the aging sick, utilizing mental hygiene, physiotherapy, rehabilitation, and some medicine. The teaching geriatric clinic will train physicians, nurses, and ancillary personnel in the best methods of conducting such clinics.

Service Geriatric Clinics — Several geriatric clinics will be organized as soon as the necessary arrangements can be made and staffs trained to conduct them. It is expected that these clinics will, in turn, use their facilities to demonstrate to the profession the best method of handling the problems of this old-age group.

Research — The aged person is the sum total of all his previous experiences. For example, it is believed that some of the chronic diseases have their origin in occurrences years before the disease manifests itself; heart disease may follow rheumatic fever or syphilis; hypertension appears to be inherited; certain forms of cancer appear to be associated with poverty; lung cancer may follow prolonged years of cigarette smoking, and heart disease may also be related to smoking. Not only do the chronic diseases have their origin in earlier life, but the other facets which comprise the geriatric problem also begin before senescence.

The accompanying diagram shows the likely time of origin. However, the exact time of onset of many of the contributing factors is, of course, unknown and it will require extensive research to complete such a diagram accurately. A long-term study of geriatric patients in the clinics, perhaps supplemented by studies made in nursing homes as well as homes for the aged, is anticipated. The non-directive technique of interviewing should be employed and calls should be frequent so that the patient would talk freely. It is believed that sufficient information will be obtained regarding the time of onset of some of the factors inherent in many of the aged to enable the establishment of prevention programs for at least some of the problems of old age.

In Memoriam

CHANNING C. SIMMONS, M.D.

Died August 15, 1953

Dr. Simmons had been an active supporter of the cancer program since its inception in 1926. During the war years, he served as Assistant Director. He edited the two editions of the book *Cancer, A Manual for Practitioners*, and made a survey of the State-aided cancer clinics. For many years he served on the Cancer Advisory Committee, at first as a member and later as Chairman. After he terminated his official connection with the Department, he frequently visited at the Division office since his advice was sought on many occasions.

IRA T. NATHANSON, M.D.

Died May 3, 1954

Cancer lost one of its foremost workers and the Division of Cancer and Chronic Disease lost a good friend when Dr. Ira T. Nathanson passed away. From his early days at Pondville Hospital to the time of his death, he kept in close contact with the Division.

STATISTICAL REPORT

January 1, 1950 to December 31, 1955

TABLE I — *Cancer Death Rates in Massachusetts*
(Rates per 100,000)

Year	Crude Rate		Adjusted Rate*	
	Male	Female	Male	Female
1925–1929	109.9	149.8	150.8	205.7
1930–1934	127.3	159.9	162.8	204.9
1935–1939	146.0	169.1	170.3	199.2
1940–1944	163.9	178.9	178.3	195.2
1945–1949	180.9	181.7	186.0	187.4
1950–1954	198.2	184.1	196.6	184.5

*Adjusted — Massachusetts population, 1950.

TABLE II — *Ratio of Cancer Deaths to Total Deaths in Massachusetts*

Age	Males						Females					
	1925	1930	1935	1940	1945	1950	1925	1930	1935	1940	1945	1950
All Ages	8.1	9.9	10.9	12.5	13.9	15.4	12.2	13.7	15.0	16.5	17.2	18.0
30–39	4.3	4.5	4.8	6.9	8.7	11.3	9.6	11.0	11.9	17.8	16.6	24.9
40–49	7.7	8.4	9.8	10.6	11.1	14.3	21.6	22.0	22.7	27.7	28.7	34.4
50–59	13.0	14.2	13.8	15.3	15.4	18.1	23.5	25.2	24.7	27.2	29.4	32.0
60–69	14.7	15.8	15.1	16.1	18.0	19.0	19.0	19.0	20.8	21.7	22.5	23.3
70–79	11.5	13.4	14.6	14.8	16.7	17.0	13.2	14.3	14.8	15.2	16.0	16.4
80+	7.0	7.4	7.7	9.2	11.5	11.6	7.2	8.1	7.8	8.6	8.9	9.4

TABLE III — *Volume of Clinic Attendance and Specimens at the Tumor Diagnosis Service*

	1940	1950	1951	1952	1953	1954	1955
Total Number of Patients at Cancer Clinics	24,264	27,623	26,658	27,275	28,257	29,882	32,525
Percentage of Cancer Patients Attending Clinics Referred by Physicians	86.4	86.3	83.9	85.1	84.8	85.3	84.6
Number of Specimens Examined by Tumor Diagnosis Services	3,907	9,862	9,720	10,110	10,145	11,570	12,301
Number of Doctors Using Tumor Diagnosis Service	798	1,218	1,133	1,125	1,233	1,227	1,323

TABLE IV — *Attendance of New Patients at Cancer Clinics*

		Number of Individuals	Attendance All Clinics	Total Diagnosis
New Cancers Diagnosed at Clinic	1950	1618	1708	1693
	1951	1469	1548	1545
	1952	1602	1678	1700
	1953	1719	1719	1753
	1954	1648	1720	1772
	1955	1762	1843	1893
Check-ups Following Treatment for Cancer Elsewhere —no Evidence of Cancer at Time of Clinic Visit	1950	165	169	178
	1951	195	207	204
	1952	189	196	209
	1953	196	196	203
	1954	167	183	194
	1955	574	580	615
Non-Cancer Diagnosis	1950	2974	3021	2987
	1951	2807	2857	2829
	1952	2585	2636	2604
	1953	2763	2763	2743
	1954	2695	2732	2718
	1955	2758	2784	2773
Totals	1950	4747	4898	4858
	1951	4471	4612	4578
	1952	4376	4510	4513
	1953	4678	4678	4699
	1954	4510	4635	4684
	1955	5094	5207	5281

TABLE V — *Site of Cancers Diagnosed in Cancer Clinics*

	Percentage of Cancer Patients With Cancer of Given Site	Percentage of Cancers of Given Site—That Were Primary	Percentage of Primary Cancers Given Site That Were Localized
Lip	3.0	93.5	93.6
Other Buccal	6.3	90.1	44.6
Stomach	2.9	88.8	20.4
Intestines	3.8	79.7	42.2
Rectum	3.8	88.9	53.4
Other Digestive	1.7	94.6	54.3
Respiratory	6.9	91.1	38.4
Breast	11.8	78.3	39.3
Female Genitals	11.3	78.2	53.7
Male Genitals	2.2	80.8	54.2
Urinary Organs	2.2	76.0	59.6
Skin	34.1	95.2	97.8
All Other Sites	5.4	85.7	23.8
Lymphomas	4.6		

TABLE VI — *Site of Specimens Examined by the Tumor Diagnosis Service, 1955*

Site	Percentage Malignant 1955	Percentage Malignant 1950	Percentage Distribution of Malignant Specimens 1955	Percentage Distribution of Malignant Specimens 1950	Percentage Distribution of Total Specimens 1955	Percentage Distribution of Total Specimens 1950
Buccal Cavity	12.4	13.8	4.5	8.6	5.0	8.6
Digestive System	16.4	23.8	6.8	10.7	5.9	6.2
Respiratory System	13.7	25.0	0.9	0.9	0.9	0.5
Breast	16.8	19.9	2.1	5.4	1.7	3.7
Female Genitals	4.6	5.8	8.8	13.5	27.0	32.0
Male Genitals	11.4	15.4	0.5	0.9	0.6	0.8
Skin	19.2	16.4	71.4	53.4	52.1	44.5
Urinary Organs	32.5	23.3	0.8	1.1	0.3	0.6
Others	9.2	25.3	4.2	5.4	6.3	3.1

TABLE VII — *Total Attendance at Individual State-Aided Cancer Clinics*

Location	Hospital	1950	1951	1952	1953	1954	1955
Beverly	Beverly	335	408	368	306	330	306
Boston	Beth Israel	1,530	1,517	1,500	1,421	1,185	1,135
	Boston Dispensary	2,176	1,923	1,697	1,411	1,379	1,277
	Massachusetts Memorial	–	–	–	–	–	287*
Brookline	Free Hospital for Women	–	–	–	–	–	902*
Brockton	Brockton	570	481	381	385	404	339
Cambridge	Mt. Auburn	–	–	–	–	10*	283
	Cambridge City	–	–	–	–	–	82*
Fall River	Union	1,080	1,006	757	818	825	1,203
Fitchburg	Burbank	148	160	182	195	238	267
Gardner	Henry Heywood	91	106	90	92	105	77
Gloucester	Addison Gilbert	80	103	77	108	81	89
Greenfield	Franklin County	74	57	46	35	35	37
Lawrence	Lawrence General	928	1,166	782	840	989	976
Lowell	Lowell General	281	371	257	278	246	227
	St. John's	–	–	–	–	–	–
	St. Joseph's	–	–	–	–	–	–
Lynn	Lynn	1,036	939	959	891	924	752
New Bedford	St. Luke's	883	691	586	721	633	556
Newton	Newton-Wellesley	–	25*	319	344	244	230
Norfolk	Pondville	8,458	8,539	9,843	10,611	11,805	13,108
North Adams	North Adams	37	29	33	39	38	32
Quincy	Quincy City	–	–	–	–	–	16*
Salem	Salem	411	408	385	340	381	363
Springfield	Springfield	452	490	422	506	494	453
Westfield	Westfield Sanatorium	7,783	7,274	7,631	8,048	8,550	8,576
Worcester	Worcester Memorial	1,411	1,106	1,108	994	1,129	952
	St. Vincent's	–	–	–	–	–	–

*Newly established — figures less than one year.

TABLE VIII — *Conditions Screened by Multiple Tests*
Rate per 100

Disease	First Clinic	Second Clinic	Third Clinic	Fourth Clinic
Albuminuria	4.2	3.0	3.9	0.6
Anemia	2.7	4.4	4.5	4.5
Cancer — Lung	0.3	0.0	0.0	0.0
Cancer — Uterus (Papanicolaou)	0.4	0.3	1.3	1.2
Diabetes	1.5	2.4	4.7	3.1
Digestive System (Occult Blood)	0.7	1.5	7.0	4.4
Vision	12.5	8.9	13.9	16.0
Glycosuria	12.8	4.8	2.8	2.4
Healed Lesions (X-ray)	1.3	4.8	3.4	1.4
Hearing	8.7	8.2	9.0	13.6
Heart (X-ray, Electrocardiogram)	1.8	4.4	11.4	11.7
Hypertension	12.4	14.3	14.3	17.5
Other Conditions by X-ray	0.0	0.04	0.1	1.0
Other Respiratory	0.9	1.6	2.4	3.1
Overweight	29.1	27.3	23.4	20.7
Skeletal Abnormalities (X-ray)	0.9	3.0	1.9	2.0
Syphilis (Hinton Test)	0.5	0.2	0.5	0.5
Tuberculosis — Lungs (X-ray)	0.8	0.2	0.9	2.6
Underweight	0.5	0.2	1.0	0.5

TABLE IX — *Survival of Cancer Patients, By Site, at Massachusetts Cancer Clinics*, 1927–1955

Site	5-Year Survival Rate	10-Year Survival Rate	15-Year Survival Rate	20-Year Survival Rate	25-Year Survival Rate
Breast	36.6	22.7	16.3	11.4	8.3
Stomach	5.1	3.3	2.0	1.6	0.0
Skin	67.3	44.7	29.2	18.0	10.8
Lung	14.4	4.3	0.0	0.0	0.0
Rectum	17.4	12.2	7.1	3.6	2.4
Uterus	40.8	27.3	19.8	12.7	4.9
Prostate	19.7	4.8	2.9	0.0	0.0
Cervix	33.0	22.0	19.0	15.9	11.1
Lip	65.1	41.9	29.3	18.1	11.0
Esophagus	0.8	0.5	0.0	0.0	0.0
Intestines	21.1	13.6	9.6	6.3	4.7
Leukemia	10.4	4.4	3.3	1.6	0.0
Buccal and Pharynx	18.5	9.5	5.4	3.6	1.7
Other Female Genitals	11.7	7.6	5.0	3.9	3.1
Larynx	16.4	9.7	5.7	1.7	0.0
Lymphomas	24.9	14.4	9.4	6.1	0.0
All Others	17.1	12.7	9.8	7.6	6.1

CHART I

TEN LEADING CAUSES OF DEATH IN MASSACHUSETTS

1910 and 1954

Death Rates per 100,000

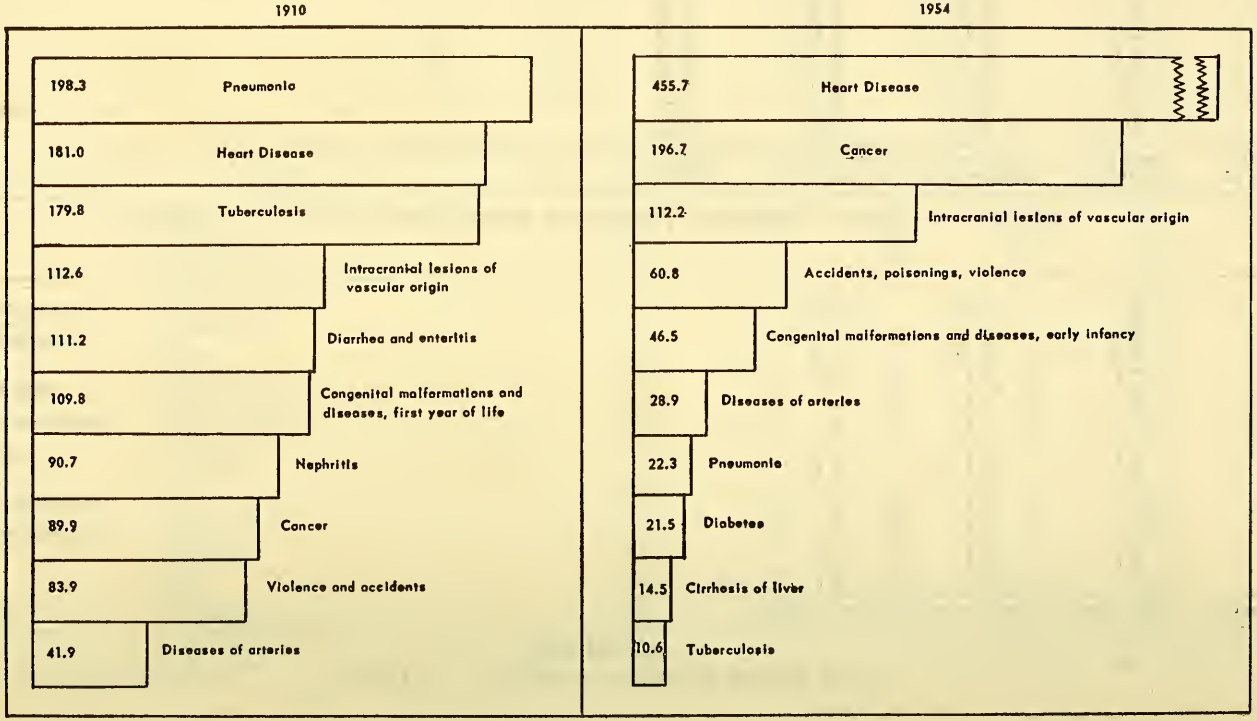


CHART 2

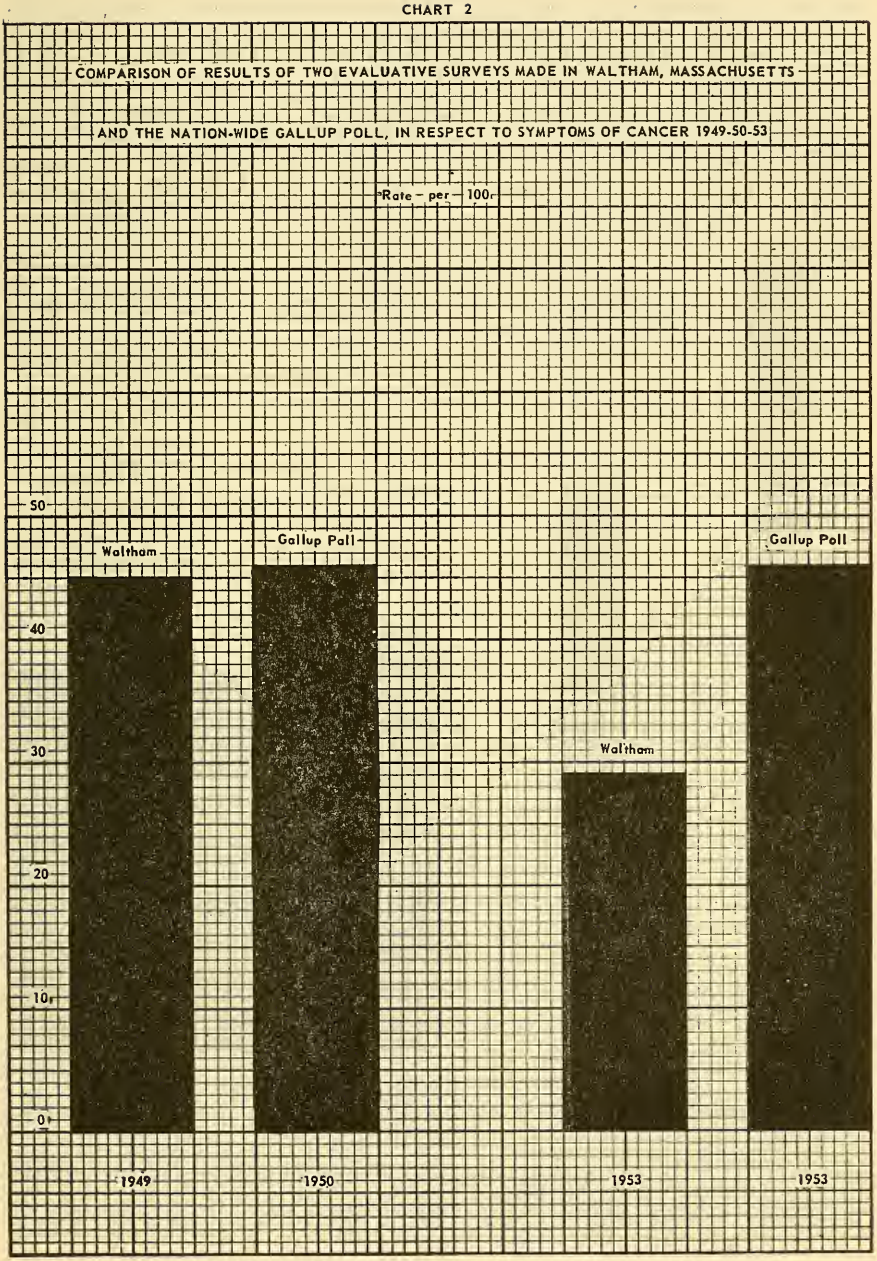

COMPARISON OF RESULTS OF TWO EVALUATIVE SURVEYS MADE IN WALTHAM, MASSACHUSETTS
AND THE NATION-WIDE GALLUP POLL, IN RESPECT TO SYMPTOMS OF CANCER 1949-50-53
Rate - per - 100
50
40
30
20
10
0
Waltham
Gallup Poll
Waltham
Gallup Poll
1949
1950
1953
1953

CHART 3

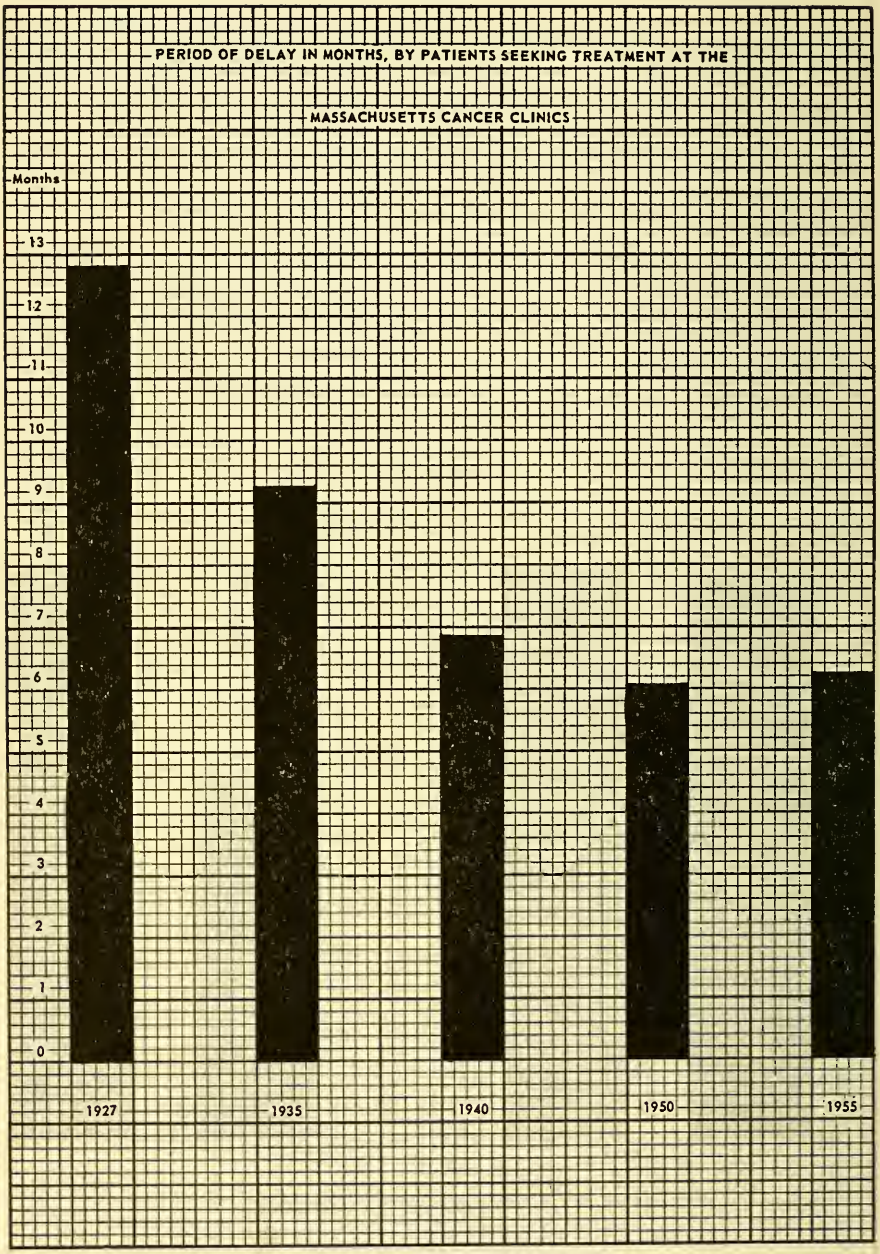

PERIOD OF DELAY IN MONTHS, BY PATIENTS SEEKING TREATMENT AT THE
MASSACHUSETTS CANCER CLINICS
Months
13
12
11
10
9
8
7
6
5
4
3
2
1
0
1927
1935
1940
1950
1955

CHART 4

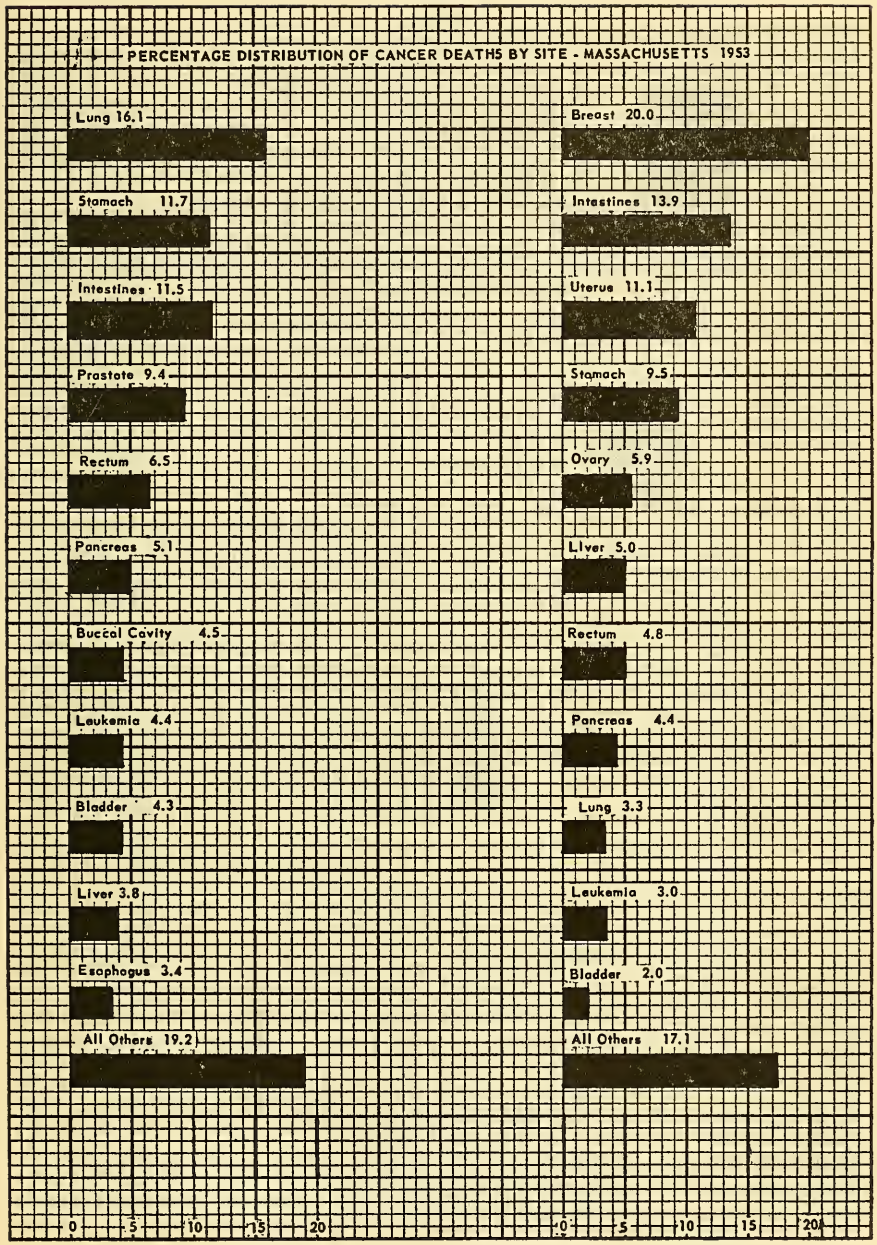

PERCENTAGE DISTRIBUTION OF CANCER DEATHS BY SITE - MASSACHUSETTS 1953
Lung 16.1
Stomach 11.7
Intestines 11.5
Prostate 9.4
Rectum 6.5
Pancreas 5.1
Buccal Cavity 4.5
Leukemia 4.4
Bladder 4.3
Liver 3.8
Esophagus 3.4
All Others 19.2
0 5 10 15 20
Breast 20.0
Intestines 13.9
Uterus 11.1
Stomach 9.5
Ovary 5.9
Liver 5.0
Rectum 4.8
Pancreas 4.4
Lung 3.3
Leukemia 3.0
Bladder 2.0
All Others 17.1
0 5 10 15 20

CHART 5

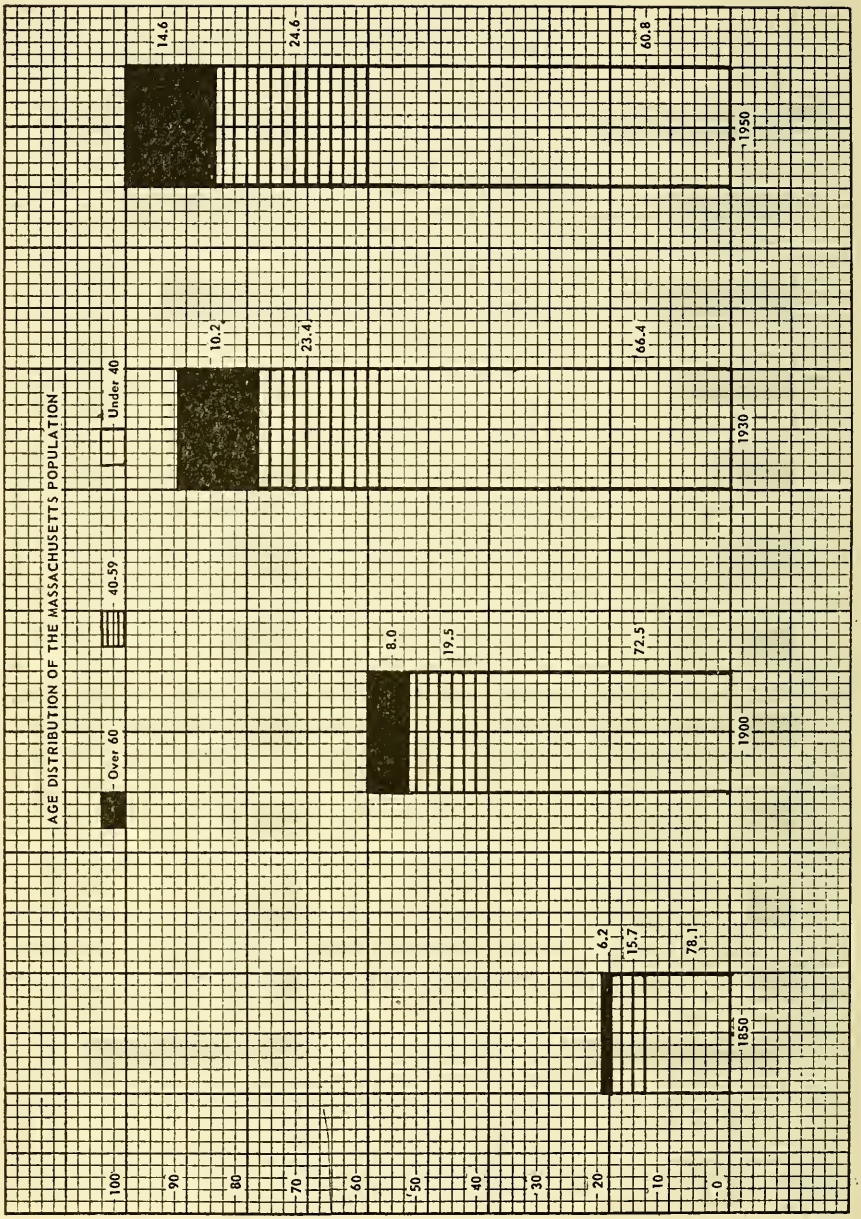

AGE DISTRIBUTION OF THE MASSACHUSETTS POPULATION
Over 60
40-59
Under 40
100
90
80
70
60
50
40
30
20
10
0
6.2
15.7
78.1
1850
8.0
19.5
72.5
1900
10.2
23.4
66.4
1930
14.6
24.6
60.8
1950

CHART 6

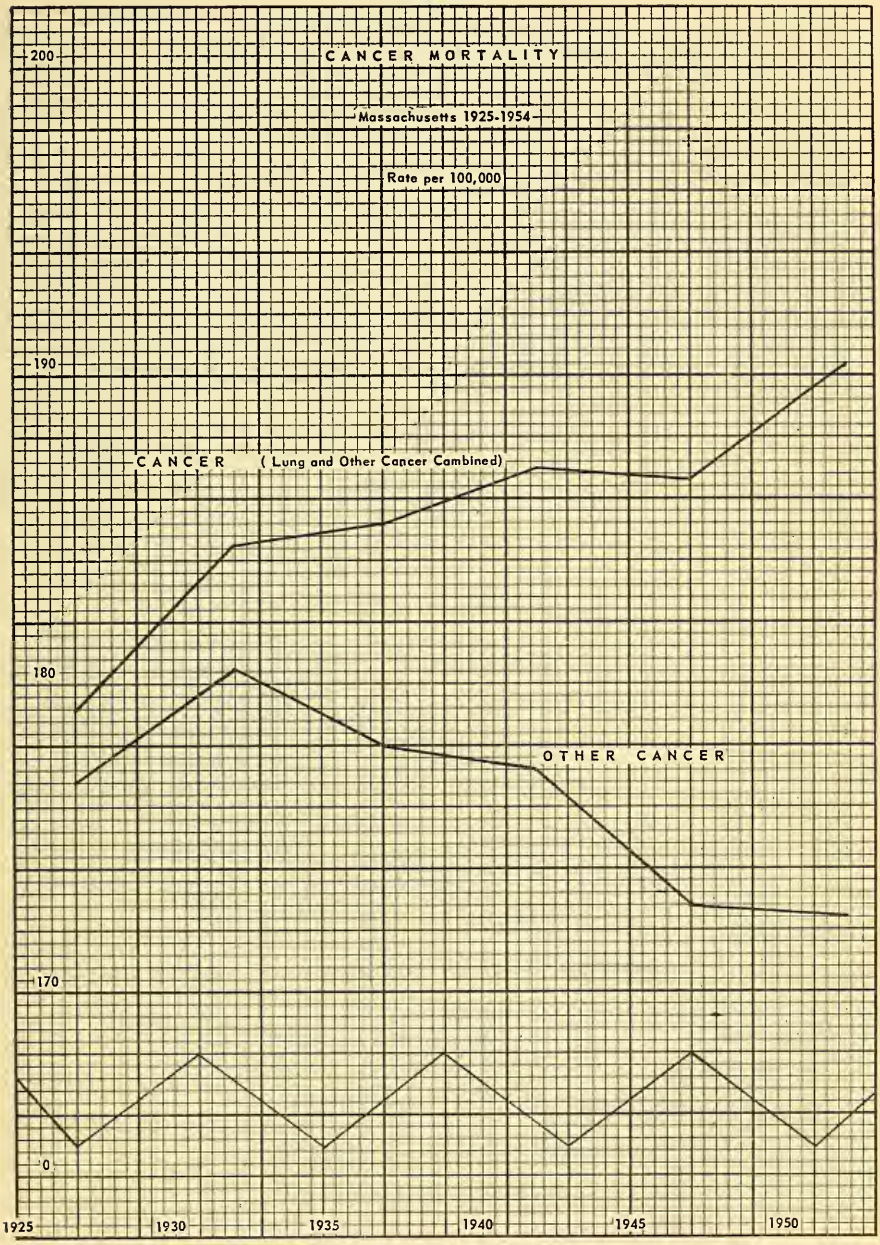

CANCER MORTALITY
Massachusetts 1925-1954
Rate per 100,000
200
190
180
170
0
CANCER (Lung and Other Cancer Combined)
OTHER CANCER
1925
1930
1935
1940
1945
1950

CHART 7

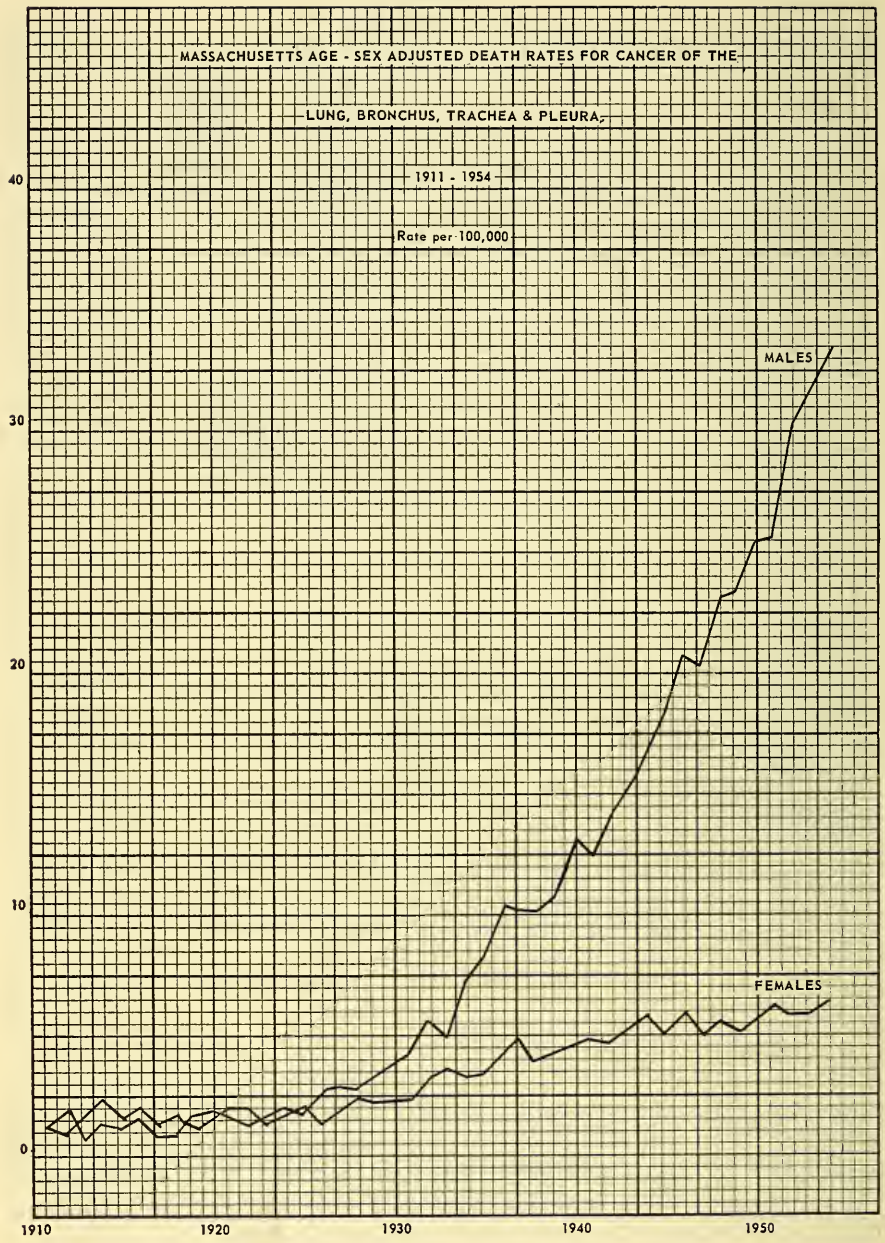
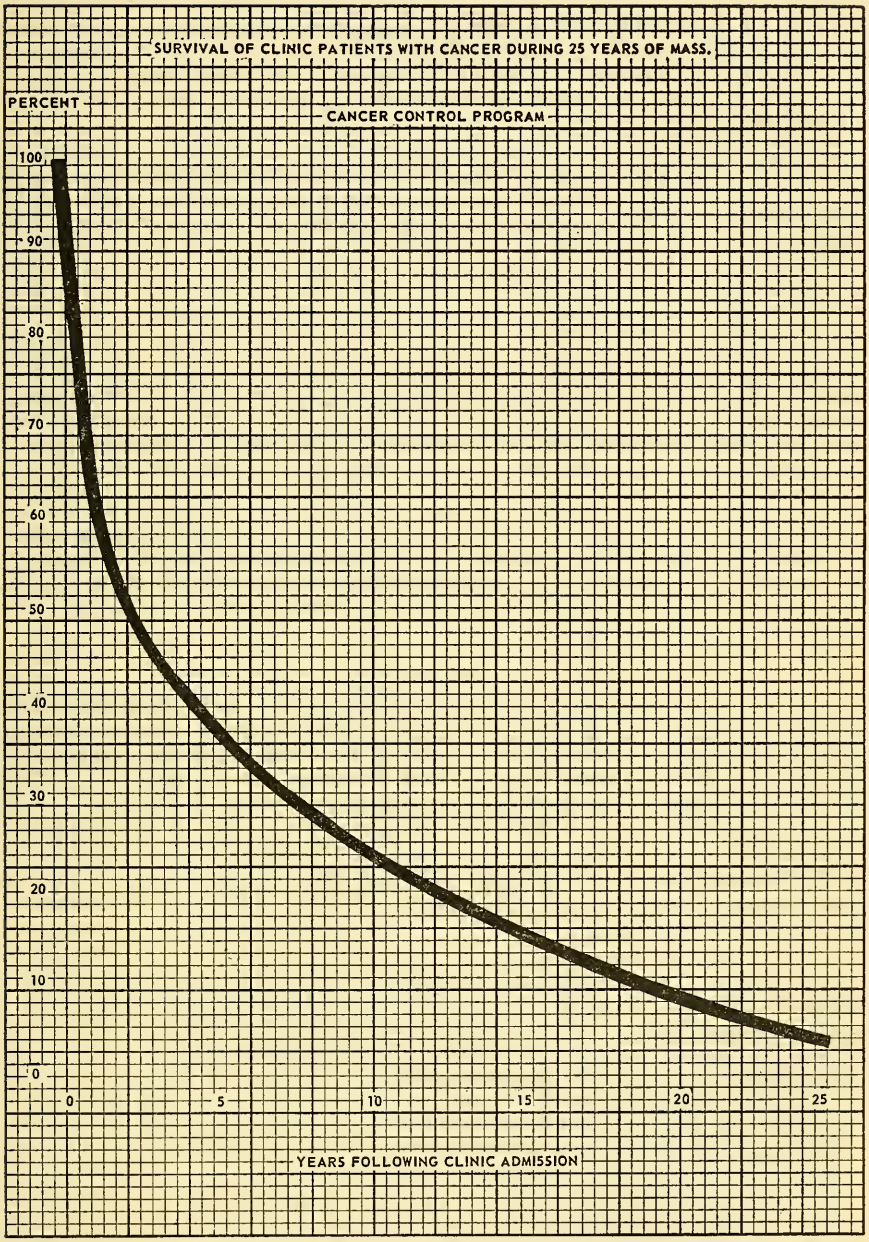

MASSACHUSETTS AGE - SEX ADJUSTED DEATH RATES FOR CANCER OF THE
LUNG, BRONCHUS, TRACHEA & PLEURA,
1911 - 1954
Rate per 100,000
MALES
FEMALES
40
30
20
10
0
1910
1920
1930
1940
1950

CHART 8


SURVIVAL OF CLINIC PATIENTS WITH CANCER DURING 25 YEARS OF MASS.
CANCER CONTROL PROGRAM
PERCENT
100
90
80
70
60
50
40
30
20
10
0
0
5
10
15
20
25
YEARS FOLLOWING CLINIC ADMISSION

DIVISION OF ALCOHOLISM

The Division of Alcoholism was established by an act of the General Court signed by the Governor on August 17, 1950. Under this act the Department of Public Health was authorized to develop a program for alcoholism. The objectives assigned to the Department were threefold: (1) the establishment of such clinic and hospital facilities as are necessary for the proper diagnosis, treatment, and rehabilitation of persons addicted to the excessive use of alcoholic beverages; (2) the study of problems related to alcoholism; (3) the promotion of a preventive and educational program concerned with the problems of alcoholism.

In order to carry out the provisions of this law the Department established the Division of Alcoholism as of November 17, 1950. The alcoholism program is organized on the basic principle that the alcoholic is a sick person who can be helped to recovery and is worthy of such assistance; furthermore, "that when an illness becomes so widespread in the population, so serious in its effects, so costly in its treatment that the individual cannot cope with it himself, it then becomes a public health responsibility." This quotation is from Dr. Thomas Parran, former Surgeon General of the United States Public Health Service.

Alcoholism is now considered to be the fourth most important public health problem in the United States, being exceeded in importance only by heart disease, tuberculosis, and cancer. The distinguishing characteristic of the modern approach to this age-old problem is the understanding that alcoholism is a progressive disease or illness which may be arrested at any stage in development, but once established can only be successfully controlled by total abstinence. While we do not as yet have a complete understanding of the exact pathologic changes that go on in the body during the progress of this disease, we do know that it is an irreversible reaction and that it seems to be in the nature of a sensitized phenomenon similar to, but not identical with, anaphylaxis. It has been believed for ages that once an alcoholic always an alcoholic. This belief has been confirmed by recent scientific study and is the basis for the saying that for the alcoholic "one drink is too many and a thousand not enough."

Administration

The Division of Alcoholism occupies a suite of offices on the fifth floor of No. 8 Beacon Street, Boston. It has an authorized staff of a Director, Assistant to the Director, Supervisor of Social Services, and Senior Clerk and Stenographer. The first director of the Division was Dr. John C. Ayres, who resigned his position with the Department to become Commissioner of Health in Springfield. On August 1, 1953 Dr. James B. Moloney was appointed Director and remains to the present time.

The State cooperating alcoholism clinics are 10 in number; they are used for the diagnosis, treatment, and rehabilitation of persons addicted to the excessive use of alcoholic beverages.

These clinics are located in the out-patient departments of general hospitals. The Department reimburses these hospitals for the operation of these alcoholism clinics in accordance with the standards set by the Division of Alcoholism. Each of these clinics has a physician-in-charge who is particularly trained in the clinical aspects of the treatment of alcoholism. The physician-in-charge assumes the responsibility for the clinical management of all patients in that clinic. He is assisted by one or more physicians in accordance with the size and case load of the clinic. In addition to the physicians, the clinics have full-time social workers, and in some the services of a psychologist are used on a part-time basis. Clerical assistants are employed on a full-time basis in all the clinics.

One of the key individuals in the cooperating clinic team is the social worker, who interviews all patients. Therefore, the social worker must be an individual endowed with tact and understanding and one who wins the confidence of the patient.

Essential to an alcoholism control program is the adequate reporting of patients with alcoholism. Table I depicts the number of patients admitted to the co-

operating clinics from 1951 to 1955, inclusive. Table II shows the referral source of patients admitted to the clinics. Table III gives the occupation status of patients admitted, and Table IV depicts the age and status of patients discharged from the cooperating clinics.

TABLE I — *Age and Sex of Patients Admitted to Clinics for Alcoholism*
1951–1955

Age	19.1 M	F.	1952 M.	F.	1953 M.	F.	1954 M.	F.	1955 M.	F.	Total M.	F.
10–14	1	–	3	2	–	–	–	–	–	–	4	2
15–19	2	–	7	5	1	–	–	–	1	1	11	6
20–24	5	3	37	12	6	1	14	6	13	3	75	25
25–29	30	6	70	18	48	9	39	8	45	10	232	51
30–34	73	16	87	21	81	14	61	21	90	19	392	91
35–39	79	19	82	29	73	14	69	31	132	30	435	123
40–44	86	27	79	11	88	31	90	26	138	30	481	125
45–49	63	17	55	9	90	18	90	16	128	25	426	85
50–54	39	9	33	10	45	14	55	10	103	19	275	62
55–59	19	6	10	–	20	5	37	5	42	7	128	23
60–64	8	5	5	–	14	2	14	4	19	10	60	21
65–69	–	–	1	–	4	–	7	1	8	2	20	3
70–74	3	–	–	–	2	–	2	–	6	–	13	–
75–79	1	–	–	–	–	–	1	–	1	1	3	1
80–84	–	–	–	–	–	–	–	–	1	–	1	–
Not Stated	–	2	4	1	4	–	2	2	5	1	15	6
Total	409	110	473	118	476	108	481	130	732	158	2571	624

TABLE II — *Referral Source of Patients Admitted to Clinics for Alcoholism*
1951–1955

Source	1951	1952	1953	1954	1955	Total
Self	154	152	96	111	83	596
Relative	54	56	46	39	136	331
Friend	52	55	37	30	77	251
Court	83	84	84	78	52	381
Social Agency	38	60	54	98	101	351
Physician	60	96	120	132	220	628
Spouse	24	15	19	20	16	94
Clergy	6	13	6	26	40	91
A. A.	11	12	16	35	57	131
Other	37	48	106	42	108	341
Total	519	591	584	611	890	3195

TABLE III — *Occupational Status of Patients Admitted to Clinics for Alcoholism*
1951–1955

Occupation	1951	1952	1953	1954	1955	Total
Professional workers	8	20	39	18	32	117
Semiprofessional workers	16	8	6	15	25	70
Proprietors, managers and officials	25	22	22	36	44	149
Clerical and Sales	98	93	86	77	128	482
Craftsmen, foremen	87	90	99	108	217	601
Operatives	21	27	49	31	48	176
Service workers, domestic	5	37	9	–	13	64
Not domestic	62	41	61	113	119	396
Laborers	110	156	100	97	144	607
Housewives	56	40	32	43	69	240
Students	3	2	–	1	3	9
Military	3	2	2	–	3	10
Not stated	25	53	79	72	45	274
Total	519	591	584	611	890	3195

TABLE IV — *Age and Status of Patients Discharged from Clinics for Alcoholism* 1951–1955

Age	Recovered	Self-Terminated or Lost	Unresponsive or Uncooperative	Total
15–19	1	1	1	3
20–24	12	14	8	34
25–29	32	57	35	124
30–34	87	107	86	280
35–39	86	114	91	291
40–44	129	107	83	319
45–49	119	107	63	289
50–54	67	77	46	190
55–59	49	37	17	103
60–64	26	10	10	46
65–69	6	4	3	13
70–74	5	–	–	5
75–79	1	–	–	1
80–84	1	–	–	1
Not stated	8	15	6	29
Total	629	650	449	1728

TREATMENT

There are three prime requisites for the successful treatment of alcoholism. The first is that the person suffering from this illness admit that he is in need of help; second, he must request help; and third, he must agree to cooperate in treatment. Given these three essentials, a person suffering from this illness has a good chance of recovery and rehabilitation. The road back to sobriety is difficult and is beset with many obstacles, and the goal of complete rehabilitation means readjustment to complete social living, but it can be accomplished, as has been demonstrated so admirably by the thousands of persons who have recovered from alcoholism through Alcoholics Anonymous.

Popular belief to the contrary notwithstanding, the typical alcoholic is not invariably a "Skid Row" character. Representatives from all levels of society succumb to alcoholism, from the humblest unskilled manual laborer to the most highly trained mechanical and professional worker. Alcohol is no respecter of persons. Anyone can be caught in the mire of addictive drinking if he drinks steadily enough and for a sufficiently long period of time. This does not mean that abnormal persons, or those suffering from personality defects or aberrations, may not become alcoholics, because they frequently do. But the alcoholism is probably separate and distinct from the underlying personality defect.

The out-patient clinic is the basic unit of service to the alcoholic. In each case the different problems involved are studied and plans are formulated for treatment. The individual must be helped to adjust his life, without alcohol, to the community and environment wherein he lives or expects to live. Merely to keep the alcoholic sober in the artificial environment of an institution or in complete dependence on a therapist is expensive, ineffective, and bound to lead to failure.

Establishment of such cooperating clinics in out-patient departments of general hospitals offers many advantages. To the alcoholic, it means the acceptance of his affliction as a disease to be cared for in a facility where other ailments are similarly treated. This tends to remove the stigma so frequently attached to alcoholism, and it renders the alcoholic more ready and willing to recognize, admit, and accept his inability to handle alcohol and to seek help. To the physician, it means the ready availability of a specialized diagnostic and therapeutic service necessary for treating patients as a whole. To the hospital staff, it offers first-hand knowledge as to the nature of alcoholism and its treatment. Furthermore, it makes available a facility where patients primarily admitted or hospitalized for an organic illness may be referred for study and treatment of a secondary alcoholic problem. To the hospital, it also means the offering of additional beneficial services to the community, thereby increasing its value to the community at large.

Drugs used in the treatment of alcoholism are of two main categories: (1) prophylactic and (2) symptomatic.

The drug disulfiram, more popularly known as antabuse, originated in Denmark, and at first was hailed as the long-sought for "cure" for alcoholism. But the initial enthusiasm has waned, and now it is considered to be a potentially dangerous drug which may have some value when skillfully used. In effect this drug puts a psychological barb-wire fence around the alcoholic, or in fact any person so far as taking the first glass of an alcoholic beverage is concerned. But the effect lasts only a few days after cessation of taking the pills. The drug has many contraindications and can only be given with the knowledge, consent, and cooperation of the patient. The symptomatic drugs, as the name implies, are tranquillizers, and in skillful hands probably have some value. But drug therapy is only an adjunct, and not necessarily a requisite adjunct, to treatment. Psychiatric and supportive social therapy are used as indicated. Each case is individualized and treatment is offered on this basis. This, however, does not preclude the use of group therapy in suitable cases.

In the final analysis, alcoholism is a biosocial problem of the first magnitude, which requires the combined efforts and resources of several disciplines for its solution. Medicine, psychiatry, and social service are involved in the remedial or therapeutic phase, but the only way that alcoholism can be prevented — and after all, prevention is the prime objective of all public health work — is through education.

Education

The third objective assigned the Department by the original legislation was the "promotion of a preventive and educational program concerned with the problems of alcoholism." This is a particularly difficult assignment, as there has been no concise and authoritative declaration of principles by the leaders in the field of alcoholism. The restrictions imposed by the protagonists of both the "Wets" and the "Drys" and the diverse cultural and religious backgrounds of pupils make the path of the alcoholism educator narrow indeed.

The plan of operation, therefore, in dealing with this problem of education for prevention has been to adhere strictly to an objective presentation of scientifically demonstrable facts, so that each individual may preserve his inalienable right to his own decision as to drink or not to drink alcoholic beverages.

DIVISION OF COMMUNICABLE DISEASES

Roy F. Feemster, M.D., Dr. P.H., *Director*

General Statement

The period 1950–1955 was ushered in by a general low prevalence of communicable diseases, 1950 showing the lowest total since 1916. The next two years showed an increase, reaching 119,000 cases in 1952. This was followed in 1953 with a drop to about the same level of 1950, and a gradual rise again to 112,000 in 1955. These fluctuations are due largely to variations in the acute communicable diseases of childhood.

Prevalence of Communicable Diseases

Brucellosis — This disease, which was formerly tabulated under undulant fever, has been at a consistently low level during the six-year period. Only once were more than 20 cases reported in a single year. In 1955 only nine cases were reported. Since the disease in the past has been largely due to the bovine organism and has been transmitted by milk, this is a good measure of the widespread acceptance and efficient application of pasteurization.

Chicken Pox — This disease did not fall below 12,000 cases per year during the period, and in 1953 it exceeded 23,000 cases, the highest number ever recorded. It is interesting to compare this incidence of a disease for which we have no immunization with that of smallpox, which has completely disappeared from the State.

Diphtheria — After 25 years of increasing acceptance of diphtheria immunization and a continual increase in the effectiveness of the agents, diphtheria is finally declining to almost the vanishing point. The incidence dropped below 100 for the first time in the history of the State in 1951, and during the last four years has only once exceeded 30 cases per year. In 1955 only 19 cases were reported.

Dysentery, Bacillary — For some undetermined reason this disease showed a sudden increase in 1953, confined largely to some of the larger municipal areas in the State, and occurring especially among families in low-income groups. Without any increased measures of control the disease has gradually declined since that date.

Encephalitis, Infectious — This disease has been at the highest level during the period since the occurrence of Von Economo's disease in the '20s and '30s. The disease may have resulted from the increased interest in virus diseases and greater use of virus laboratories in making diagnoses. Some of the cases are no doubt due to Coxsackie viruses and ECHO viruses.

In 1955 there was a mild recurrence of eastern equine encephalomyelitis, resulting in four human cases and illness in more than 40 horses.

Gastroenteritis — This disease, as such, is not reportable except that the Department must be informed when outbreaks occur. Many of the cases, of course, are eventually reported as Salmonella infections or bacillary dysentery. The bulk of the outbreaks, however, are usually due to staphylococcus food poisoning. A list of the outbreaks which have been brought to the attention of the Department will be found in the tabulation of outbreaks later in this report.

German Measles — Except for 1952, when 15,000 cases were reported, this disease has been at a low level throughout the period.

Hepatitis, Infectious — This disease showed a rapid increase, beginning in 1952 and reaching nearly 1300 cases in 1954. In 1955 it dropped to under 900 cases. This rise in incidence is a part of a national wave of the disease. Until we have further experience it is difficult to determine whether the rise was due to increased reporting by physicians who were just discovering that the disease should be reported or whether the increase was real. If it eventually turns out that we have nearly 1000 cases per year, an increase to 1300 would mean very little.

Malaria — Reported cases of this disease have very little significance since they are all acquired outside of the State.

Measles — The period was characterized by two record outbreaks of this disease — the highest in 1952 — but more than 50,000 cases were reported in 1955. In

spite of this high prevalence the number of deaths remained below any other period in the past.

Meningitis, Meningococcal — This disease fluctuated between 60 and 85 cases during the period. In spite of the fact that the sulfonamides and other specific treatments are quite effective, the deaths fluctuated between 13 and 27 per year.

Meningitis, Other Forms — The influenza bacillus is responsible for one-half to two-thirds as many cases as the meningococcus, but almost equals the number of deaths. Because of the frequent reporting of aseptic meningitis, which was formerly confused with nonparalytic poliomyelitis, meningitis undetermined has been on the increase.

Mumps — Mumps rose to the highest level in the history of the State in 1954, with over 18,000 cases recorded. On the other hand, three years during the period have shown only about half that number of cases.

Poliomyelitis — Interest in this disease has continued to mount. In 1953 the Division participated in a nation-wide evaluation of the usefulness of gamma globulin in the prevention of the paralysis of poliomyelitis. These studies were disappointing because it was not possible to show that there was any great value in its use in household contacts after a case had occurred.

In 1954 the Department participated in the nation-wide poliomyelitis vaccine field trials, during the course of which more than 14,000 children in the first, second, and third grades of 25 communities received polio vaccine and an equal number an inert material. Massachusetts' contribution to this study was minimal because poliomyelitis was at a low level during this study, and because many of the cases which were reported as poliomyelitis were really minor illnesses due to confused viruses.

Two events characterized the year 1955: first, the giving of one dose of polio vaccine to first and second grade children throughout the Commonwealth, and then the long pause in the program due to the fact that some lots of vaccine proved unsafe. The second event was the largest outbreak of poliomyelitis that ever occurred in this state, 3950 cases having been recorded. With funds made available by the National Foundation for Infantile Paralysis, a special study of the value of one dose of polio vaccine was carried out during the progress of this epidemic. This study demonstrated the usefulness of even one dose in an epidemic situation.

Rabies — Not only were there no human cases of rabies during the period, but there were no rabid animals discovered in the State. Under such circumstances it becomes increasingly difficult to maintain inoculation of dogs with rabies vaccine. If the disease should be reintroduced by a dog coming in during the incubation period, the low immunity of the dog population might furnish an opportunity for an epidemic among animals.

Salmonellosis — There was a continual rise in the incidence of this disease during the period, going from about 70 cases in 1950 to nearly 350 in 1955. This disease is difficult to control because the reservoir of infection lies among animals and is introduced into the human population by animal foods which we consume. The bulk of the cases occur as single cases or small family outbreaks, but occasionally there is a small epidemic when a kitchen becomes infected with the organism. A table giving the varieties of Salmonella organisms most frequently encountered appears in Volume II of this report.

Scarlet Fever — This disease has been at a low level during the whole period, due partly, no doubt, to the mildness of the disease in recent years, but also due to the widespread use of sulpha drugs and antibiotics which keep down the numbers of streptococci harbored in the population.

Smallpox — The continued absence of this disease from the State is heartening but is partly explained by the fact that 300,000 doses of smallpox vaccine are distributed annually for immunization purposes. It is now almost 25 years since a case of the disease occurred in Massachusetts.

Typhoid Fever — Only once during the period were there more than 25 cases reported in a single year. The period ended with the lowest prevalence of the disease ever recorded.

The number of typhoid carriers on our list is gradually declining, due to the advanced age of most of the carriers and to the fact that there is little replacement following active cases of the disease.

Whooping Cough — Since the first year in this period whooping cough has been making new low records of prevalence. The period ended with the lowest incidence of the disease that has ever been recorded in the State. Much of this is, of course, due to the widespread use of pertussis vaccine now included in our triple antigen for the immunization of preschool children.

Other Diseases — Occasional cases of anthrax, psittacosis, Rocky Mountain spotted fever, trichinosis, and tularemia continue to occur, but the incidence of these diseases was not remarkable during the period.

Reorganization

In 1950 the Diagnostic Laboratory, consisting of the two divisions, the Bacteriological Laboratory and the Wassermann Laboratory, was transferred to the Institute of Laboratories. No further mention of the activities of the Laboratories will be made in the report of this Division.

Epidemiology

Due to the inadequate salary for the Assistant Director, this position has not been kept filled, so that during a good portion of the period only one physician, in addition to the Director, has been available for carrying on the work of the Division. In addition, the number of district health officers has been reduced to five, and since they usually make the primary investigations, each has more work to do. Consequently, the records of the Division have been falling behind. This situation would have been acute, indeed, if the number of epidemics had not been on the decrease. Those which have occurred have been mainly staphylococcus food poisoning and Salmonella infections.

Special Projects and Studies

Diphtheria Study — The study on the practicability of immunizing high school students against diphtheria without preliminary Schick tests was concluded early in the period, and the program for giving diphtheria toxoid to high school students was incorporated in our recommendations regarding immunizations.

Boston Exanthem — Early in the period, a study was carried out with the assistance of Dr. Neva of the Children's Medical Center on an illness characterized by a skin rash which differed from measles, German measles, scarlet fever, roseola infantum, and other childhood diseases. Eventually Dr. Neva was able to isolate a virus from specimens from these children and the new disease was named the Boston exanthem.

Equine Encephalitis — In 1953, meteorological conditions in the spring made it appear that a bad mosquito year was in prospect, and it was feared that encephalitis due to the eastern equine virus might reappear. A study was undertaken to determine if the virus was present in the State, with the assistance of the Virus and Rickettsia Laboratory of the Public Health Service. About 150 specimens of blood from birds were sent to the laboratory for examination. Nearly one-fourth of them showed evidence that the birds had been infected with either the eastern or western virus. In addition, the eastern virus was isolated from one bird. The eastern virus was also isolated from a horse which had been diagnosed as having horse sleeping sickness. This was good evidence that the virus was present in the State in 1953.

Poliomyelitis — In the midst of the 1955 outbreak of poliomyelitis, the Department was asked by the National Foundation for Infantile Paralysis to undertake a study of the usefulness of one dose of polio vaccine in preventing the paralysis of poliomyelitis. Since the staff of the Division was too heavily loaded with work connected with the outbreak, it was necessary to organize a team of temporary workers to carry out the project. This study revealed that one dose of vaccine was quite effective in preventing paralysis.

Milk Regulations — This Division continued its interest in passing the regulations requiring the pasteurization of milk. During the period, the number of communities which had such regulations increased from 111 to 146. Pamphlets are regularly supplied by the Division on various aspects of milk and its value as a food and danger as a carrier of disease, to assist in obtaining the passing of such regulations.

Interstate Problems

During the period, the Director has participated in making several studies regarding problems which involve numerous states.

Rabies — Two conferences in New York City were attended by representatives of the states of New England as well as New York, Pennsylvania, and New Jersey. Early in the period invasion in Massachusetts from eastern New York was feared and special vigilance was being observed to discover if any rabid animals were entering the State from the west. New York and Pennsylvania were both having acute problems with rabies in wildlife, with accompanying loss of domestic animals bitten by foxes. Control measures have reduced the disease in these two states, and the threatened invasion in Massachusetts has not taken place.

Gamma Globulin — In 1953, the National Foundation for Infantile Paralysis released gamma globulin for the prevention of poliomyelitis, and since there was great question in regard to its possible usefulness, a national study was undertaken. The Director was a member of the national committee and attended several meetings outside the State in regard to the problem. The study failed to reveal any practical usefulness of gamma globulin.

Polio Vaccine Field Trials — When the National Foundation for Infantile Paralysis undertook a national study of the usefulness of Salk's polio vaccine, the Director was a member of a national committee which guided the direction of the study. Several meetings were held in New York City, Atlanta, and Columbus, Ohio. The studies were evaluated by a group at the University of Michigan headed by Dr. Thomas Francis and proved conclusively that polio vaccine gave protection against paralysis.

Mass Use of Polio Vaccine — The same committee which had guided the studies of the field trials of polio vaccine was called upon to guide the use of the vaccine furnished by the National Foundation for Infantile Paralysis in 1955, and to make recommendations in regard to the distribution of polio vaccine in 1956. The Director attended several out-of-state meetings in connection with this committee and also meetings called by the Public Health Service.

Pakistan Program

In 1952, when the Department undertook to staff the health team being sent to Pakistan by the Department of State of the United States Government, the Director was sent to Pakistan on a three-months trip to make preliminary plans for the work of the team. Thereafter, he continued for a time as a member of the Advisory Committee of the Department on the Pakistan Program.

Residency Training

When the Department undertook to provide residency training for physicians in preventive medicine, the Director was asked to assume responsibility as Educational Director for this program. He attended a national meeting on the program at the University of North Carolina and worked with the Department's Director of Training in setting up the program for this group.

Revision of Regulations

A number of changes were made in the isolation and quarantine requirements for communicable diseases in 1952. Proposed changes were submitted to an Advisory Committee for revisions before adoption.

Communicable Disease Information

Early in the period, the Division was publishing information in regard to communicable diseases in its weekly publication called *Communicable Disease Information.* In 1952, this publication became a departmental outlet for news and the name was changed to *This Week in Public Health.* The information which had been going out previously in the publication of the Division has continued to be included in the departmental organ. Those articles on communicable diseases of wider interest are reprinted in pamphlet form for distribution. The Director also acted as editor of the Department's column in the *New England Journal of Medicine.*

Publications

During this period the Division was responsible for the publication of the following articles:

Clinical and Epidemiological Features of an Unusual Epidemic Exanthem, by Franklin A. Neva, M.D., Roy F. Feemster, M.D., and Ilse J. Gorbach, M.D., *Journal of the American Medical Association,* 155: 544–548 (June 5, 1954).

An Outbreak of Salmonellosis Traced to Watermelon, by Gilbert E. Gayler, M.D., Robert A. MacCready, M.D., Joseph P. Reardon, M.D., and Bernard F. McKernan, M.D., *Public Health Reports,* 70: No. 3 (March, 1955).

Evaluation of Poliomyelitis Vaccination in Massachusetts, Alton S. Pope, M.D., Roy F. Feemster, M.D., David E. Rosengard, M.D., Florence R. B. Hopkins, M.D., Boris Vanadzin, M.D., and Edgar W. Pattison, M.S., *New England Journal of Medicine,* 254: 110–117 (January 19, 1956).

Note: Statistical tables showing the incidence of diseases are shown in Volume II of this report.

DIVISION OF DENTAL HEALTH

This report covers the second half of the first decade of this Division's activities. During this period the staff of nine professional dental personnel and three clerical personnel have directed their energies to the control of dental diseases by contributing to the development of specific preventive procedures, control methods, and dental health educational procedures at the community level.

The practical application of the first major technical breakthrough in the prevention of dental caries by the fluoridation of water supplies has not only produced encouraging trends in the suppression of tooth decay, but has stimulated more public and professional discussion on the public health significance of dental disabilities than in any other period in the Department's history.

Fluoridation

Twenty Massachusetts communities began the fluoridation of their water supplies on a continuing basis during this period — the first beginning in May, 1951. In most of these communities the Division has taken baseline dental caries prevalence measurements for future evaluation purposes. In those communities of oldest fluoridation history interim measurements have indicated the beginning of dental caries suppression. An example of the order of these findings is included in Table I.

The subject of fluoridation has usually been attended by considerable public debate in those communities where it has come up for official consideration. The Division has served as a resource of information for local officials looking into the question. During this period the probability of a community adopting this procedure once it has opened the subject to popular debate has been about fifty per cent.

Other Preventive Measures

During these years the topical application of fluoride salts to children's teeth has been attempted by some communities as a public health approach to the prevention of dental caries. In general, the method has been found cumbersome in operation and remains unevaluated in the few locations where it still is practiced.

Educational attempts at reducing excessive carbohydrate consumption as a threat to dental health have been one of the chief foundations of public health efforts in this field.

Professional Resources

The numbers of dentists and dental hygienists available during this period have grown with the same speed as that of the general population, leaving the dentist-population and dental hygienist-population ratios in a favorable position relative to those of the nation and the other states. The Division has been able to assist the development of these trained personnel by directing material resources to the professional schools in the State through the medium of educational project grants.

For the public health aspects of professional dental training, the Division has designed and conducted in-service training courses for those in public employment. During this time about one-half of the dental hygienists in public health work have received this type of training, but only 5 per cent of the dentists have had this opportunity, as these resources have been available to them only during the last several months of this period.

Disease Prevalence and Treatment Effectiveness

Requests by communities for evaluation of their dental health programs have provided opportunities for measurement of certain oral diseases. Of chief significance have been the observations on dental caries history of school age children. Tables II and III illustrate this particular disease prevalence and the relative treatment effectiveness for it in a group of communities observed in 1953. These observations were performed under the conditions prescribed by the Council on Dental Health of the American Dental Association for Type III examinations. Repeated observations of this type have left us with the impression that oral disease prevalence has remained unchanged during this period in all areas except those which have undertaken the fluoridation of water supplies. Toward the end of

this period there has been some evidence that a significant improvement has been made in the timely treatment of dental defects by conventional dental operative procedures.

Projections of our observations have led us to the belief that at the close of this period in the school-age population of this State, three teeth were decaying every minute and that one-half of them were receiving timely reparative dental treatment for the control of the disease.

TABLE I — *Fluoridation Data, Athol, Massachusetts,* 1951 *and* 1954

	Age (in Years)							
	6		7		8		9	
	1951	1954	1951	1954	1951	1954	1951	1954
Number of Cases	123	164	175	169	178	157	199	119
Percent with one or more DMF	70	33	87	65	99	92	97	94
DMF	2.07	0.79	2.81	1.75	3.93	2.81	4.75	3.70
D/DMF	.98	.89	.92	.85	.88	.73	.82	.61
M/DMF	.00	.01	.00	.01	.01	.02	.02	.05
F/DMF	.02	.11	.08	.14	.11	.25	.16	.34

TABLE II — *Average Number of Decayed, Missing, and Filled Permanent Teeth Per Child by Age in Sixteen Massachusetts Communities,* 1953

Age	Number of Cases	Percent with One or More DMF Teeth	Decayed Teeth Per Child	Missing Teeth Per Child	Filled Teeth Per Child	DMF Teeth Per Child	σ obs
5	220	17%	0.30	0.00	0.02	0.32	0.87
6	1354	42%	0.96	0.00	0.05	1.01	1.42
7	845	75%	1.85	0.02	0.33	2.20	1.63
8	687	88%	2.42	0.06	0.56	3.04	1.73
9	490	94%	2.87	0.16	0.90	3.93	2.15
10	345	96%	3.53	0.28	1.11	4.92	2.88
11	308	99%	4.97	0.49	1.49	6.95	4.11
12	534	99%	5.61	0.55	2.30	8.46	4.53
13	600	99%	6.20	0.72	3.01	9.93	4.89
14	552	100%	6.20	0.83	4.20	11.23	5.19
15	110	100%	7.20	1.17	4.18	12.55	6.21
16	92	100%	5.43	1.49	6.75	13.67	5.15
17	167	100%	4.97	1.47	7.78	14.22	5.84

TABLE III — *Average Number of Decayed, Extracted, and Filled Deciduous Teeth Per Child by Age in Sixteeen Massachusetts Communities,* 1953

Age	Number of Cases	Percent with One or More def Teeth	Number of Decayed Teeth Per Child	Number of Extracted Teeth Per Child	Number of Filled Teeth Per Child	Number of def Teeth Per Child	σ obs
4	347	68%	2.00	0.04	0.86	2.90	3.05
5	427	83%	3.70	0.30	0.89	4.89	3.86
6	1427	88%	4.71	0.51	0.86	6.08	4.05
7	845	91%	4.48	0.73	0.97	6.18	3.60
8	570	92%	4.18	0.69	0.88	5.75	3.05

COMMUNITY DENTAL HEALTH PROGRAMS

Assistant communities in the development of their own dental programs has been a major effort of this Division. With the chief efforts directed at the health of the school-age child, these local programs in 1955 screened about one-half the school-age population for the early detection and correction of dental defects by the use of 250 dentists and 79 dental hygienists. By the use of board of health dental clinics they provided dental services to 86,000 children, or approximately 10 per cent of the total population of the age levels they were designed to serve. It is estimated that these local programs reached 25 per cent of the total school population through their health education efforts by use of media prepared by this Division.

DIVISION OF VENEREAL DISEASES

The Division of Venereal Diseases occupies a suite of offices located on the second floor of the Ford Building, 15 Ashburton Place, Boston. It has an authorized complement of a Director, Assistant Director, two public health nursing supervisors, and a stenographic and clerical staff of 11. The clerical staff consists of one principal clerk, one senior statistical clerk, two senior clerk-stenographers, one junior key punch operator, three junior clerk-stenographers, and three junior clerk-typists.

The Division of Venereal Diseases is one of five divisions in the Bureau of Preventive Medicine. This regrouping of the division into the Bureau of Preventive Medicine took place in fiscal 1955.

Budget

The appropriation for the fiscal years 1949–1956 follows:

	Personal Services	Travel	Laboratory, Medical and General Care	Miscellaneous Expenses
1950	$53,360.00	$1,432.04	$314,037.78	$7,652.00
1951	56,665.00	1,250.00	313,210.00	6,890.00
1952	60,925.00	940.00	300,120.00	8,151.00
1953	61,150.00	1,000.00	303,980.00	6,473.00
1954	54,855.00	1,050.00	293,400.00	4,789.00
1955	63,005.00	950.00	292,400.00	8,554.00
1956	61,590.00	950.00	292,500.00	8,616.00

Modus Operandi

According to Chapter 111, Section 117, of the General Laws, the Division of Venereal Diseases is required to plan, promote, and carry out a sound venereal disease control program. This constitutes prevention of venereal disease as well as finding and treating these diseases when they occur. Thus, the Division must promote good social hygiene measures, initiate case-finding procedures, and provide for diagnostic, treatment, and case-holding facilities.

The Division is not alone in carrying out a preventive program for disease control. It is a well known fact that sexual promiscuity is the underlying factor in the spread of venereal disease; that if sexual promiscuity is reduced or controlled there will be a corresponding decrease in venereal disease. One of the methods used to discourage promiscuity is to make such illicit relationships illegal and punishable under the law. Thus, the fear of legal sanction decreases the extent of promiscuity. More important than the fear of legal sanction is the education of the individual in the principles of sound social hygiene. This is a continuing process beginning in infancy and carried out into adulthood. The education begins in the home and is supplemented by the teachings of the church, schools, physicians, communities, youth agencies, law enforcement groups, welfare, social agencies, etc. All of these groups of people by their concerted action can influence the incidence of sexual promiscuity and venereal disease.

There are 23 state cooperating venereal disease clinics located strategically throughout the State. With the exception of four, they are set up in the outpatient departments of general hospitals. Here the medically indigent are examined and treated if infected. Here too the work of contact investigation begins with the all-important interview, which is conducted by specially trained public health nurses and in a few clinics by trained medical social workers. On these interviews depends the outcome of the contact investigation.

The Department reimburses these hospitals and clinics for the maintenance and operation of the venereal disease clinics in accordance with the high standards set by the Division of Venereal Diseases. Each of the clinics has a chief in charge who is a physician particularly trained in the clinical aspects of venereal disease. Therefore, he assumes the responsibility for the clinical management of all patients in

that clinic. He is assisted by one or more physicians in accordance with the size and case load of the clinic. In addition to the physicians, the clinic has a number of clinic nurses. Social workers are available either on a full-time or part-time basis, in accordance with the clinic's case load. There are three clinics in which no social worker is employed. These clinics use the social worker in the District Health Office to perform the social service work requested by the clinic chief.

One of the key individuals in the cooperating clinic team is the epidemiologist, who interviews all patients for pertinent contacts and brings these latter individuals to the clinic for diagnostic work-up and treatment if infected. However, if the contact prefers to go to a private physician, arrangements are made to furnish this physician with all pertinent data so that he may be on a particular watch for that disease to which the contact was exposed. Our epidemiologists, for the most part, are graduate registered nurses who have had considerable training in generalized public health nursing and specialized training in venereal disease control. Interviewing and contact tracing require specific talents, such as tact and understanding, being able to win the confidence of patients, yet being sufficiently forceful to impress patients to develop good social attitudes, particularly towards sex. These nurses must also possess perseverance, ingenuity, and initiative in order to carry out the primary functions of interviewing and investigation.

The epidemiologist working from a cooperating clinic covers a specific area, and all patients and contacts residing within her area are her responsibility. Thus, the epidemiologist is not only responsible for the follow-up of patients and contacts living in her district and originating from her clinic, but she also does the follow-up of any contact or person living in her district but originating from any other clinic within the state or from out of state.

In Metropolitan Boston, the organization of epidemiological services has been modified because of the larger case load and the fact that clinic sessions are held more frequently, and in some hospitals morning as well as evening clinics are in session. Thus, each of the venereal disease clinics in Boston is headed by a specialized public health nurse who is called the Clinic Executive. She directs all aspects of the clinic, including contact interviewing. The investigations are carried out by five nurse epidemiologists. Each epidemiologist has an office in one of the Boston clinics and has an assigned district. Like her co-worker outside of the metropolitan area, she visits patients, contacts, and suspects located in her district regardless of the hospital to which the patient has reported or irrespective of the origin of the contact or suspect report. In addition to contact investigation, the epidemiologist in the Metropolitan Boston area also interviews military patients for contacts.

Résumé of Activities

The past seven years were marked by many changes in the administrative, clinical, and public health practices of the Division in keeping with modern venereal disease control activities. One year prior to this report, the Division staff prepared a new epidemiological and lapsed case report. Hand in hand with these new forms and a prerequisite to their proper completion was the development of standards for interviewing and describing contacts of patients with venereal diseases. Following this, changes had to be made in the morbidity reporting system. Beginning with the state cooperating venereal disease clinics, where the bulk of reported cases came, dual-purpose I.B.M. cards were designed to serve as registration cards for the clinics as well as disposition or morbidity report forms. At the same time, a central registry file was developed for the Division of Venereal Diseases and one similar, but on a lesser scale, for the State cooperating clinics.

From fiscal 1951 to 1953, experience was gained with the new morbidity forms for the clinics, and on the basis of this experience a new morbidity report form for private physicians and institutions was put into effect in February, 1953.

PATIENT CLINIC NO. | DATE OF FIRST VISIT THIS ADMISSION | LAST NAME | FIRST | MIDDLE

REPORTING AGENCY

AGE

SEX ☐ M ☐ F

COLOR ☐ W ☐ C ☐ Y ☐ O

MARITAL STATUS ☐ S ☐ M ☐ W ☐ D ☐ SEP

OCCUPATION

SCHOOLING (CIRCLE HIGHEST GRADE COMPLETED)
1 2 3 4 5 6 7
8 9 10 11 12 13+

REASON FOR COMING TO CLINIC (CHECK ONE)

☐ CONTACT

☐ SUSPECT
- ☐ ROUTINE BLOOD
- ☐ INDUSTRIAL
- ☐ PREMARITAL
- ☐ PRENATAL
- ☐ BLOOD DONOR
- ☐ OTHER _____ SPECIFY

☐ VOLUNTARY

☐ ANNUAL CHECK UP

☐ REFERRED BY: L.MD. INST. B of H. COURT. OTHER _____ (SPECIFY)

ADDRESS

DISEASE
- ☐ GONORRHEA
- ☐ SYPHILIS
- ☐ CHANCROID
- ☐ GRANULOMA INGUINALE
- ☐ LYMPHOGRANULOMA VENEREUM

JBR 690828

REGISTRATION CARD

PREPARE THIS CARD AT TIME OF PATIENT'S FIRST VISIT TO CLINIC AND SEND IMMEDIATELY TO THE

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF VENEREAL DISEASES
ROOM 546 STATE HOUSE
BOSTON 33, MASS.

MASS. PUB. HLTH. V.D. CARD NO. 1 1954

PATIENT CLINIC NUMBER | DATE OF DIAGNOSIS OR DISPOSITION | LAST NAME | FIRST | MIDDLE

RESULT OF DIAGNOSTIC OBSERVATIONS	DISEASE AND STAGE	PREVIOUS THIS INFECTION	PREVIOUS & ADEQUATE	NUMBER OF CONTACTS OBTAINED	REMARKS
☐ NOT INFECTED	☐ SYPHILIS				
☐ INFECTED →	☐ PRIMARY				
	☐ SECONDARY				
	☐ EARLY LATENT				
☐ TRANSFERRED TO	☐ LATE LATENT				
SPECIFY	☐ NEURO				
	☐ OTHER LATE (SPECIFY)				
☐ LOST TO FOLLOW UP	☐ CONGENITAL				
☐ ON SUSPICION	☐ GONORRHEA				
	☐ CHANCROID				
☐ OTHER (SPECIFY IN REMARKS)	☐ GRANULOMA INGUINALE				
	☐ LYMPHOGRANULOMA VENEREUM				

SIGNED _____ M.D.

CLINIC: _____

JBR 847202

HOLD THIS CARD IN FILE UNTIL A DECISION HAS BEEN MADE ON THIS PATIENT AND THEN RETURN IMMEDIATELY TO THE

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF VENEREAL DISEASES
ROOM 546 STATE HOUSE
BOSTON 33, MASS.

MASS. PUB. HLTH. V.D. CARD NO. 2 1954

CONFIDENTIAL G. L., CHAPTER 111, SECTION 119

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
REPORT OF A CASE OF VENEREAL DISEASE

NAME OF PATIENT _____ AGE (OR DATE OF BIRTH) _____
(OR INITIALS OR CASE NUMBER)

STREET (IF NAME GIVEN ABOVE) _____ DATE OF DIAGNOSIS _____

CITY OR TOWN _____ SEX: ☐ MALE ☐ FEMALE
MARITAL STATUS: ☐ SINGLE ☐ MARRIED ☐ WIDOWED ☐ DIVORCED ☐ SEPARATED

OCCUPATION _____ RACE: ☐ WHITE ☐ COLORED ☐ OTHER

SYPHILIS

☐ PRIMARY
☐ SECONDARY
☐ LATENT ☐ EARLY ☐ LATE
☐ LATE ☐ NEURO ☐ CARDIOVASCULAR ☐ MUCOCUTANEOUS ☐ OTHER
☐ CONGENITAL

POSITIVE TESTS
☐ DARKFIELD
☐ BLOOD
☐ SPINAL FLUID
☐ OTHER (SPECIFY)

GONORRHEA

	POSITIVE TESTS
☐ GENITOURINARY	☐ SMEAR
☐ EYE	☐ CULTURE
☐ OTHER	☐ OTHER

OTHER VENEREAL DISEASES

	POSITIVE TESTS
☐ CHANCROID	☐ DUCREY SKIN TEST
☐ GRANULOMA INGUINALE	☐ SMEAR OR BIOPSY
☐ LYMPHOGRANULOMA VENEREUM	☐ FREI SKIN TEST

HAS PATIENT HAD PREVIOUS TREATMENT FOR THIS INFECTION? ☐ YES ☐ NO IF YES, ☐ ADEQUATE ☐ INADEQUATE

ORDER SUPPLIES HERE NUMBER

REPORT BLANKS _____ SIGNED _____ M. D.

LITERATURE FOR PATIENTS _____ STREET _____

LITERATURE FOR PHYSICIANS _____ CITY OR TOWN _____ DATE _____

ALL VENEREAL DISEASE PATIENTS HAVE CONTACTS. HAVE YOU INTERVIEWED FOR CONTACTS?

(OVER)

CONFIDENTIAL, G. L., CHAPTER 111, SECTION 119

USE THIS SIDE OF FORM TO REPORT THE FOLLOWING

CHECK ONE

☐ CONTACT
☐ PATIENT HAD POSITIVE TEST FOR SYPHILIS AND DID NOT RETURN
☐ PATIENT PREMATURELY DISCONTINUED TREATMENT FOR_____ DATE OF LAST VISIT_____

NAME OF CONTACT OR PATIENT_____
STREET _____ AGE _____
CITY OR TOWN_____ SEX _____
OCCUPATION_____ PLACE OF EMPLOYMENT_____ MARITAL STATUS_____

FOLLOWING INFORMATION FOR **CONTACTS** ONLY:

CONTACT OF

☐ SYPHILIS
☐ PRIMARY
☐ SECONDARY
☐ EARLY LATENT
☐ OTHER (SPECIFY)
☐ GONORRHEA
☐ CHANCROID
☐ GRANULOMA INGUINALE
☐ LYMPHOGRANULOMA VENEREUM

RELATIONSHIP TO PATIENT:
☐ MARITAL ☐ FRIEND ☐ PICKUP ☐ PROSTITUTE ☐ OTHER

WILL YOU LOCATE AND EXAMINE THIS CONTACT? ☐ YES ☐ NO

IF NOT, THE DIVISION STAFF WILL ASSIST IN LOCATING AND REFERRING CONTACT FOR MEDICAL EXAMINATION

OTHER INFORMATION HELPFUL IN LOCATING CONTACT:_____

PATIENTS USUALLY HAVE SEVERAL CONTACTS.
PLEASE USE SEPARATE FORM FOR EACH CONTACT.

PH-VP-13. 35M 6-53-909600

State Cooperating Venereal Disease Clinics

There were twenty-four state cooperating venereal disease clinics, but on July 1, 1953 one was eliminated, leaving a balance of twenty-three clinics, which are operating up to the present time. Standards for the diagnosis and treatment of the venereal diseases were developed with the help of the advisory committee composed of the clinic chiefs. The first of the standards were published on June 9, 1949 and were amended over the years as newer and more effective methods of treatment were announced. The latest standard for the diagnosis of syphilis was published in June, 1956.

Early in this period the Division prepared frozen malarial blood for the treatment of parenchymatous neurosyphilis, but as time went on and when penicillin was demonstrated to be equally as effective as combined penicillin and malaria, the frozen malarial blood treatment was discontinued.

In the meantime, the Division published quarterly the *Bulletin of Venereal Diseases,* which dealt with some phases of the clinical problem of these diseases.

About 20 per cent of the venereal disease control problem in Massachusetts represents military cases, and in 1951 our military control program was intensified. Through the Armed Forces Disciplinary Control Board, the Director, as their civilian advisor, recommended and received their approval for more effective interviewing procedures. Beginning with Camp Devens, the nurse epidemiologists were assigned to all military installations in Massachusetts to interview military patients with venereal diseases. This cooperative venture resulted in benefits both to the military and civilian communities. In June, 1951 the Director was awarded a citation for his work with the Armed Forces Disciplinary Control Board.

The Division of Venereal Diseases was responsible also for the investigation of draftees as well as separatees discovered to have a positive blood test for syphilis or other signs of venereal diseases.

Premarital Examination Law

For the past seven years the Division has been tremendously interested in the development of a medical reciprocity between the states insofar as the premarital medical examination is concerned. Thus, if a resident of Massachusetts wishes to be married in another state, he or she may visit his or her private physician for a blood test, which is performed at the State Laboratory. Then the doctor completes the Massachusetts medical certificate, which will be honored by the other State. Similarly, the certificates of other states will be honored by Massachusetts under similar conditions. At the present time, there are 40 states and three territories which have premarital examination laws. Massachusetts will accept the certificates of 36 of these states, and two of the three territories. There are four Canadian provinces which also have premarital examination laws. Massachusetts will accept the certificate of one of them. In return, there are 19 states and two territories which have agreed to accept the Massachusetts premarital certificate when properly completed. It is our plan to establish mutual reciprocity arrangements with all states having such laws.

In conjunction with our program for a better understanding of the Massachusetts Premarital Examination Law by our State residents and doctors, two pamphlets were prepared. The first one was published in the *American Journal of Social Hygiene*, January, 1953, entitled "Marriage and the Law — Medico-legal Requirements in Massachusetts," and it was specifically designed to assist doctors, marriage registrars, and clergymen to answer questions which are frequently asked of them. The second pamphlet is entitled "Planning Your Marriage" and was designed for lay consumption. Supplies are kept by marriage registrars and are given to those who ask questions about the marriage law.

Prenatal Syphilis Study

In June, 1951 the Division of Venereal Diseases undertook a prenatal syphilis study. The purpose of this program, which continues to the present day, is to answer five major questions:

(1) What is the incidence and prevalence of prenatal syphilis at the hospitals under study?

(2) How many women develop syphilis during pregnancy subsequent to the initial negative prenatal blood test?

(3) At what month during pregnancy is the prenatal blood test taken for patients delivering at a large hospital?

(4) How many women delivering at a large hospital have no prenatal blood test taken at all?

(5) To what degree will anesthesia influence the blood test?

Up to the present time 27,580 pregnancies have been tabulated on I.B.M. cards for analysis. It is expected that this study will continue for another five years.

Education

A well-informed staff is essential to any program. In the field of venereal diseases, it is of paramount importance because of the intimate and delicate nature of the work. Therefore, the staff education program is planned in August of each year; it consists of monthly meetings of two hours each from October to June, inclusive. The first hour is taken up with a discussion of some phase of venereal disease control from either a clinical or public health aspect, and a guest speaker is invited for this part of the meeting. The second hour is spent in a discussion of the problems arising during the previous month. The staff education program was initiated in 1949 and has not only been effective in improving the caliber of the work, but has also brought about the closer integration of the field staff.

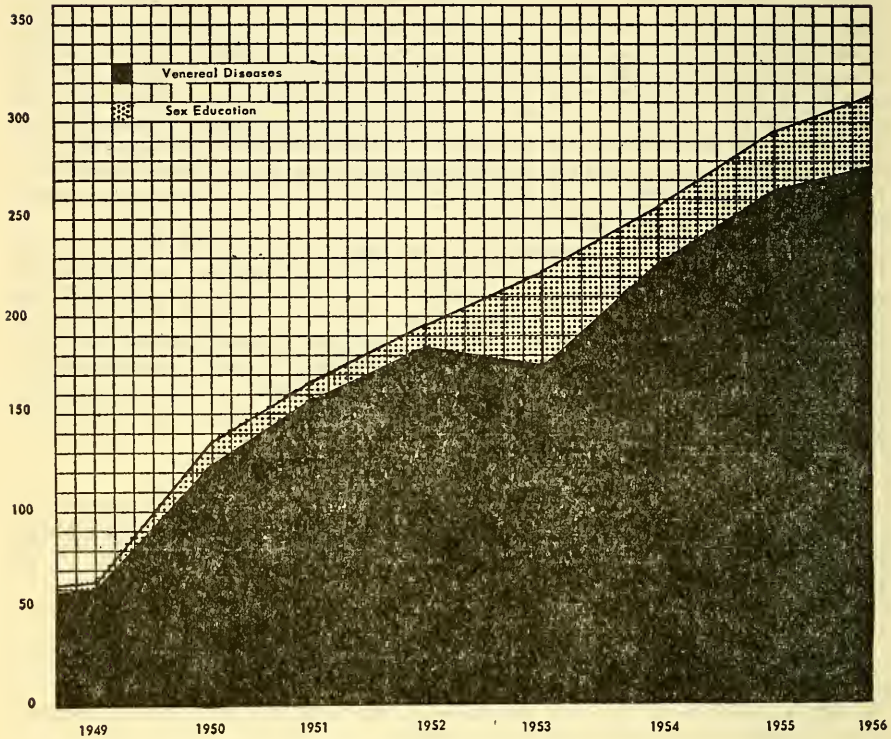
In 1949 the Division launched an educational program among schools of nursing after a preliminary survey indicated that this subject was neglected in the nursing curriculum. A six-hour course on the Clinical and Public Health Aspects of the Venereal Diseases was prepared and offered to them (Graph 1).

Graph 1

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH, DIVISION OF VENEREAL DISEASES

LECTURE HOURS GIVEN IN SEX EDUCATION AND VENEREAL DISEASES

1948 - 1956



Field training courses in venereal disease control were offered at a graduate nurse level, and each year about 12 nurses take our eight-week field training course.

A film library was created, and in fiscal 1955 there were 452 showings, primarily in schools of nursing. Complementing the film library, literature on the venereal diseases was compiled.* During the last fiscal year 24,580 pieces of literature were distributed.

During the past seven years the lowest reported number of patients with syphilis occurred in 1950, and an increase took place every year thereafter. In May, 1955 cases of primary and secondary syphilis increased in steplike fashion, continuing through the entire year. These seven years have seen the decline in syphilis, and beginning with 1951 its resurgence. Present-day control methods will not eradicate the venereal diseases, since they are designed only to reduce them. Our methods of control are not geared and by their very nature will not eradicate these diseases. Therefore, the objective of the Venereal Disease Control Program is to reduce them to their irreducible minimum. The venereal diseases are spread essentially through sexual promiscuity, but the problem of sexual promiscuity has as yet to be solved. There will always be an infectious reservoir of venereal disease in the community. The sexual mores of our people will determine whether this reservoir is to increase or decrease. If control efforts are relaxed, and the present level of sexual promiscuity persists, one can easily predict epidemics of these diseases in the future.

*This literature can be obtained from the Division of Venereal Diseases.

Publications

Fiumara, N. J. — Describing a Contact of Venereal Disease. *American Journal of Syphilis, Gonorrhea, and Venereal Diseases*, July, 1949.

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BUREAU OF INSTITUTE OF LABORATORIES

DIVISION OF BIOLOGIC LABORATORIES

On April 2, 1951 the Biologic Laboratories joined with the Diagnostic Laboratories to form the Institute, with Dr. Johannes Ipsen, Jr., Associate Professor, Harvard School of Public Health, as Superintendent. Thus, after a period of almost 60 years, the Department came back to the prototype established under the able leadership of Dr. Theobald Smith. Diagnostic services and research were then the natural outgrowths of his early work in this new field of biologic preparation.

On July 22, 1949, Dr. Geoffrey Edsall resigned as Director. Dr. James A. McComb was appointed Acting Director. He has continued as the responsible head of the laboratories, assuming the directorship in 1955.

Expansion in the number of different biologics prepared, in physical resources, including a new second-story addition to the Blood Laboratory, and greatly increased distribution marked the period which this report covers. During the same period a rapid turnover in personnel, coupled with an inability to attract highly qualified individuals to fill certain staff vacancies, has resulted in understaffing which could be dangerous. The existing inflationary spiral, if it continues much longer, can most certainly undermine key staff positions which form the foundation upon which such laboratories are constructed.

Research, particularly in the field of diphtheria prophylaxis and prophylactics, has resulted in methods which promise to be useful in succeeding years. "Serologic" epidemiology has given results which are both encouraging and disquieting. By doing antibody titrations on sera from discarded Wassermann specimens and other studies, it has been shown that a high level of immunity to diphtheria and tetanus exists in the lower age groups. This, coupled with the recent precipitous drop in the incidence of whooping cough, seems to point to the effectiveness of "Diphtheria and Tetanus Toxoids and Pertussis Vaccine, Combined, Aluminum Phosphate Precipitated." Disquieting is the low level of immunity to diphtheria found in the adult population. A study product, "Tetanus and Diphtheria Toxoids, Combined, for Adult Use" has had a modest distribution since 1954. Its increased use is much indicated.

The control testing of human blood fractions under the Cohn patents administered by the Research Corporation of New York City came to an end in 1952. The Research Corporation turned the patents back to Dr. Cohn and this work was taken over by the newly organized Protein Foundation.

Antitoxin and Vaccine Laboratory

Working with new methods and equipment, a greatly improved smallpox vaccine has been in distribution since 1950. This vaccine is more potent and almost completely free of bacterial contaminants.

The product introduced in 1950 which has had the greatest distribution of any product manufactured by the laboratories is "Diphtheria and Tetanus Toxoids and Pertussis Vaccine, Combined, Aluminum Phosphate Precipitated." Figure 1 shows the number of individual doses distributed annually.

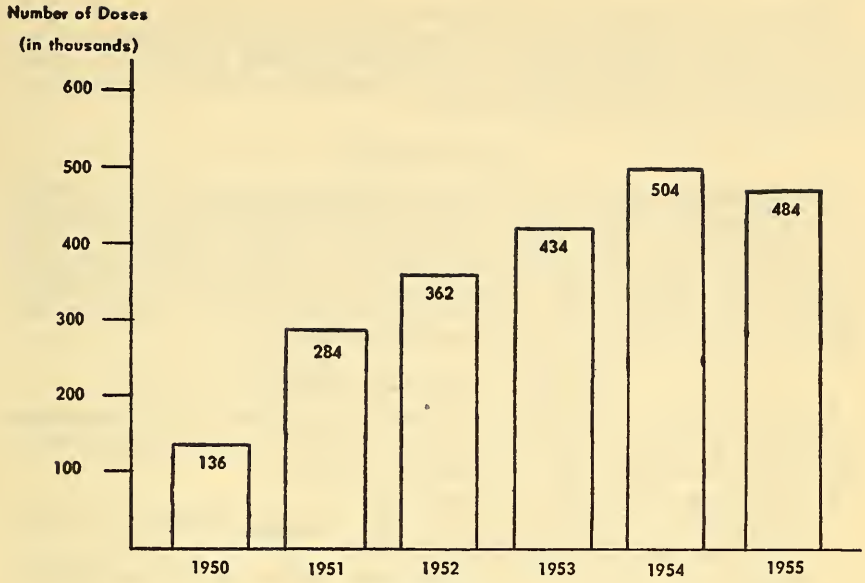

FIGURE 1
Annual Distribution of Doses

A ready-to-use diluted tuberculin has been in distribution since 1951 and is gradually replacing the Tuberculin, Old, which requires dilution before use. Another advantage of this product has been that it has discouraged the use of the higher strength dilution of tuberculin which, it is felt, does not lend itself to accurate diagnosis in this area.

The trend has been toward greater purity in such products as diphtheria and tetanus toxoids and pepsin-digested antitoxin. A critical biological test has been devised for determining the extent of the purity of tetanus antitoxin; it correlates well with the reactions or lack of them when the material is used prophylactically.

BLOOD LABORATORY

There have been many changes in this laboratory. In 1950 the American Red Cross assumed complete responsibility for the whole blood program formerly operated by the State. Laboratory pilot studies financed by the Red Cross were terminated in 1951. In that year three types of services were begun for the Red Cross on a contract basis, namely (1) plasma separation for the local Red Cross Blood Center, (2) irradiated plasma preparation and distribution, and (3) plasma fractionation for the American National Red Cross. The local center took over its own plasma separation in 1954. Due to a study showing the inability of irradiation to destroy the hepatitis virus in plasma, the American Red Cross suspended this work in 1953. Work continues in Red Cross plasma fractionation under annual contract.

Through the interest taken by the Massachusetts Medical Society and, in turn, the hospital blood banks, increasing amounts of plasma from human bloods, outdated for use as whole blood, have become available for fractionation into albumin and globulin. The albumin is returned to the participating hospitals and the globulin is used, together with Red Cross allotments to the State, for prophylaxis in measles and infectious hepatitis.

Working with Dr. Dwight Mulford, a former assistant director, the laboratory has been producing pilot lots of Fibrinogen-Free Low Globulin Plasma since 1955. The two chief advantages of this material over plasma are: (1) It will withstand 60°C. for 10 hours without significant change. This process should kill any hepatitis virus present. (2) Immune Serum Globulin is obtained as a by-product.

While civil defense demands participation of our entire resources, because of the yeoman work of the civil defense blood committee, the bulk of the planning and work has been in connection with emergency blood, blood substitutes, and fluid replacements. Throughout the life of this committee the laboratories have been represented by two or three staff members.

Special Services

The increasingly wide variety of such services begs coverage by a short description. Distribution of Poliomyelitis Immune Globulin and later that of vaccine for the 1954 field trials for the National Foundation for Infantile Paralysis were the most time-consuming. Furnishing various blood fractions, purified diphtheria antigens, and cultures of high toxin-producing bacterial strains to investigators world-wide is considered to be a part of the contribution which we should always strive to make in the furtherance of knowledge in these fields.

National Institutes of Health

Operating under U. S. License No. 64 since 1917, the name of the laboratories was changed in 1951 by the National Institutes of Health for licensing purposes to the Massachusetts Public Health Biologic Laboratories.

New licenses granted during this period were:

Diphtheria and Tetanus Toxoids and Pertussis Vaccine, Combined, Aluminum Phosphate Precipitated, 1950.

Diphtheria and Tetanus Toxoids, Combined, Aluminum Phosphate Precipitated, 1950.

Tetanus Antitoxin, 1950.

Poliomyelitis Immune Globulin, 1953.

TABLE I — *Distribution of Products*

	1950	1951	1952	1953	1954	1955
Diphtheria						
Antitoxin, 1000 unit doses	35,661	23,558	21,684	17,758	12,583	8,416
Schick Outfits, 50 doses each	3,672	3,256	2,511	2,781	2,071	2,352
Toxoid, 1 cc. doses	69,313	39,359	200	–	–	–
Toxin (bulk cc.)	2,117	1,770	1,090	1,200	1,415	1,120
Antitoxin (bulk cc.)	175	520	150	310	200	581
Diphtheria-Tetanus (cc.)	10,977*	61,387.5	79,527	77,404.5	81,157.5	75,719
Diphtheria-Tetanus-Pertussis	68,379	142,216.5	181,981.5	217,806	252,210	242,127
Diphtheria Toxoid (cc.)	83,745	–	255	646	1,495	1,100
Diphtheria-Tetanus-Paratyphoid (cc.)	–	–	–	246	16.5	–
Enteric Fevers						
Typhoid Vaccine (cc.)	14,672	8,180	7,242	6,476.5	6,635.5	14,933
Typhoid and Paratyphoid Vaccine (cc.)	77,628	73,606	77,382.5	69,110	68,755.5	98,435.5
Measles						
Immune Serum Globulin (cc.)†	44,944	54,224	115,344	48,310	181,223	129,106
Meningitis						
Antihemophilus Type B serum (vials)	23	20	1	8	–	–
Smallpox						
Smallpox Vaccine, capillary tubes	244,757	260,943	279,253	286,773	297,927	303,518
Needles	75,710	81,890	93,700	103,090	112,880	114,020
Tetanus						
Antitoxin (vials)	–	2,400	3,640	5,485	8,504	11,844
Toxoid (cc.)	42,483	63,147	57,897	61,271	67,813	84,268
Antitoxin, bovine (5 cc. vials)	–	–	–	2	3	4
Tetanus-Diphtheria Toxoid (cc.)	–	–	–	–	1,167	4,347
Tuberculosis						
Tuberculin, ampoules (0.7 cc.)	1,247	947	749	601	679	524
Tuberculin, capillary tubes	4,045	2,920	2,840	2,105	2,055	1,460
Diluted Tuberculin, 1 : 1000 (cc.)	–	374	1,996	3,826	5,010	12,912
Gonorrheal Ophthalmia						
Silver Nitrate, ampoules	119,958	127,500	127,018	113,478	123,246	136,374

TABLE I — *Distribution of Products — Continued*

	1950	1951	1952	1953	1954	1955
Syphilis						
BAL	–	1	–	–	1	–
Bismuth, Salicylate in oil, 12 cc., 30 cc., and 60 cc. bottles	884	595	222	235	230	137
Chlorasen, vials of 0.045, 0.067, 0.45 and 0.67 gm.	770	–	–	–	–	–
Ducrey Vaccine (0.2 cc. vials)	10	20	7	15	22	15
Lygranum, 1 and 10 test units	41	32	50	52	50	51
Mapharsen, 0.04, 0.06 and 0.6 gm. amps.	5,700	3,750	1,610	970	900	990
Penicillin, vials of 100,000, 200,000, 300,000, 500,000, 1,500,000 and 3,000,000 u.	5,016	3,861	3,593	2,743	2,535	3,487
Red Cross Contract Distribution						
Poliomyelitis Immune Globulin (cc.)	–	–	–	50,764	156,062	36,148
Immune Serum Globulin (cc.)	–	–	–	5,226	16,458	–
Normal Serum Albumin (100 cc. vials)	–	–	–	–	183	3,398
Transfusion Therapy						
Exchange blood (bottles)	18	–	–	–	–	–
Whole Blood (pint bottles)	5,401	–	–	–	–	–
Red Cells (bottles of various sizes)	38	–	–	–	–	–
Normal Serum Albumin (20 cc. bottles)	107	229	374	87	–	–
Normal Serum Albumin (100 cc. bottles)	502	399	465	694	1,344	2,389
Human Plasma (cc.)	–	354,600	2,491,800	282,300	100,500	–
Fibrinogen (bottles)	2	–	–	–	–	11
Frozen Malarial Blood (cc.)	67	18	–	–	–	–
Fibrin-Free Low Globulin Plasma (cc.)	–	–	–	–	11,000	40,100
Whooping Cough						
Pertussis Vaccine (cc.)	30,455	23,730	24,480	17,080	13,120	13,635
Conc. Antihemophilus Pertussis Rabbit Serum (vials)	45	48	47	71	105	75
Miscellaneous Other Products						
Antihemophilus Influenza Serum, rabbit typing, cc.	–	–	–	106	69	–
Citrated horse blood (cc.)	–	–	–	6,000	–	36,000
Defibrinated horse blood (cc.)	444,950	445,855	498,930	525,700	576,540	602,150
German Measles Immune Globulin (cc.)	–	–	418	174	60	–
Normal Horse Serum (cc.)	50,950	55,905	56,600	59,835	59,040	99,300
Serum Sensitivity Outfits — Horse	611	916	780	652	909	1,001
Serum Sensitivity Outfits — Rabbit	25	20	17	53	75	53

*End of EMIC distribution and beginning of own manufacture.
†Furnished in part by the American Red Cross.

DIVISION OF DIAGNOSTIC LABORATORIES

Diagnostic Laboratory

Increase in the amount and types of work these laboratories have performed marks the period covered by this report. The diagnosis of enteric pathogens such as the Salmonella is noteworthy in this respect. The wisdom of the earlier establishment of the Virus Laboratory was confirmed during the 1955 epidemic of poliomyelitis in Massachusetts. Another much neglected field, diagnosis and research in the pathogenic fungi, was entered in 1953. Gratifying progress has been made with this small beginning and improvements in methodology have been made.

Workshop and refresher courses for hospital technologists have been offered by the laboratories and they have been well received by hospital personnel.

New methods have been investigated for diagnostic aids in those individuals giving apparently false-positive Hinton tests.

The Diagnostic Laboratory is badly in need of an increased number of professional workers, a condition which has resulted largely from the unprecedented increase to 10-fold in the number of Salmonella recoveries since the low year of 1950, as pictured in Figure 2. In the same period the total annual samples and enteric pathogens showed an overall increase of only about 50 per cent.

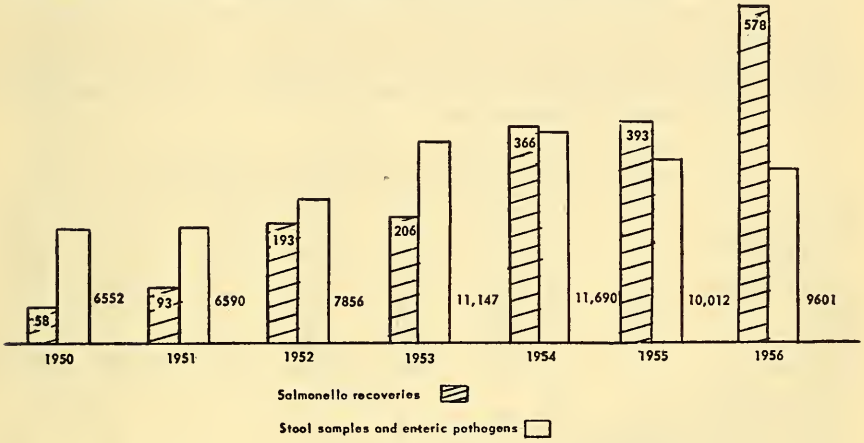

Figure 2
Salmonella Recoveries, 1950–1956

The building in which the Diagnostic Laboratories are housed is antiquated and inadequate, necessitating as it does the quartering of the virus laboratory and the research mycology laboratory in other buildings. A modern, new building is urgently needed.

Bacteriological Laboratory

Several important new activities have been added. First, in the enteric pathogens section, all stools of cases where the age is designated as two years or less are now screened for pathogenic *Escherichia coli*. This procedure is an important addition, since it has recently been shown that certain strains of *E. coli* can cause severe or even fatal illnesses in the very young. Next, in the diagnostic tuberculosis section, cultures as well as smears are now included on all cases, whether specifically requested by the physician or not, in keeping with present-day procedures recommended for the laboratory diagnosis of tuberculosis. Including cultures as well as smears on all suspected cases increases the diagnostic sensitivity of the laboratory work.

A mycology service was begun in 1953. The work in the Diagnostic Laboratory building has been confined to diagnostic work. In 1956 a new position was created, making possible operation by the Commonwealth of the research mycology labora-

tory near the Biologic Laboratories, which was formerly operated under a grant received by Harvard University. In addition to its investigative work, the research mycology laboratory has cooperated with the Diagnostic Laboratory by screening for pathogenic nocardia the atypical acid-fast cultures recovered from specimens sent to the Diagnostic Laboratory for testing for tubercle bacilli.

For several years the Diagnostic Laboratory was in active administrative and technical charge of a Civil Defense mass blood typing program. Over 300,000 persons in the Commonwealth had their bloods typed by mobile blood typing teams and were issued blood typing identification cards to carry on their persons. Before the program was given up for lack of funds, a small pilot training program for volunteer blood typers was carried out successfully.

The Virus Laboratory, which began very modestly in 1948, expanded rapidly in the 1955 summer of high poliomyelitis prevalence in Massachusetts, and was able to perform important diagnostic services in the identification of poliomyelitis viruses from stools and the titration of serums for poliomyelitis antibodies, which aided greatly in the epidemiological investigation of the outbreak. Aided by a contract with the Communicable Disease Center, and funds from the National Foundation for Infantile Paralysis, quite adequate equipment has been secured and the laboratory has become a very satisfactory operating unit. It is hampered, however, by insufficient space in spite of an additional room made available by Harvard Medical School, in the buildings of which the laboratory is located.

The laboratory approval program has continued to grow. It has effectively expanded its services from time to time by offering workshop and refresher courses for the hospital technologists desiring to attend, especially courses in the laboratory diagnosis of bacterial enteric pathogens.

TABLE I — *Numbers and Kinds of Specimens*

	1950	1951	1952	1953	1954	1955
Agglutinations	6,073	5,469	5,255	5,604	5,366	6,041
Blood Typing Tests:						
Prenatal	16,981	25,312	26,619	28,033	24,668	24,019
Civil Defense	–	–	–	204	24	264
Enteric Pathogens	6,552	6,590	7,856	11,147	11,690	10,012
Gonorrhea	5,266	5,940	3,900	3,748	3,841	3,345
Malaria	89	77	62	59	30	26
Pneumonia	49	45	34	12	33	–
Throat Cultures	5,066	4,448	4,229	3,915	3,949	5,703
Tuberculosis	9,216	9,040	9,040	9,160	8,682	8,356
Vincent's Gingivitis	–	–	–	92	85	47
Viral Serological Tests:						
Cold Agglutinus	24	24	23	3	97	176
Influenza A and B, and FM$_1$	32	126	19	52	34	130
Lymphocytic Choriomeningitis	–	–	–	–	85	96
Lymphogranuloma and Psittacosis	–	–	–	–	107	186
Mumps Complement-Fixation Tests and HAI Tests	360	178	164	228	445	224
Herpes Simplex	–	–	–	–	89	179
Leptospira	–	–	–	–	10	–
Heterophile Antibodies	–	–	–	–	42	6
Virus Isolation Attempts:						
Poliomyelitis, Coxsackie and Echo Viruses	–	–	–	–	–	226
Miscellaneous	505	456	385	441	563	445
Mycology	–	–	–	–	–	536
Totals	50,213	57,705	57,586	62,698	59,840	60,040

WASSERMANN LABORATORY

During the years from 1949 to 1956 the Wassermann Laboratory has been engaged in the usual routine work of testing specimens for syphilis, brucellosis in cattle, and rabies. In this period over 3,300,000 tests were performed. Serologic tests for syphilis comprised approximately 90 per cent of the work load. The intrastate serologic evaluation of 134 laboratories has been carried on annually for those seeking approval to perform tests for premarital, prenatal, and blood donor purposes. Refresher courses on the serology of syphilis have been held periodically.

The laboratory has participated each year in the evaluation of the Hinton test conducted by the United States Venereal Disease Research Laboratory and has maintained its usual high rating for efficiency and accuracy.

During the period from 1949 to 1956 over 1,000 specimens, including many wild animals, have been examined for rabies. All were found negative.

In 1951, due to the curtailment of federal funds, the Wassermann and Kahn tests were discontinued and two junior clerk-typist positions were abolished.

In 1952 total protein and globulin tests on specimens of spinal fluid were added to the routine procedures.

On December 31, 1953 Dr. William A. Hinton, Director of the laboratory since its establishment in 1915, was retired and Miss Genevieve O. Stuart assumed his duties as head of the laboratory.

During 1954 in cooperation with the United States Department of Agriculture a new program of testing blood and milk for the eradication of brucellosis in cattle was initiated.

During 1955 and 1956 in cooperation with the Division of Venereal Diseases experimental work on the Treponema Immune Adherence test and Treponema Pallidum Complement Fixation test was executed in an attempt to determine the feasibility of using one of these techniques as an adjunct to the standard serologic tests on specimens from patients suspected of giving biologic false-positive tests.

TABLE II — *Tests and Examinations*

KIND OF SPECIMEN	1950	1951	1952	1953	1954	1955
Blood:						
Number of Specimens	533,398	540,953	546,801	525,075	529,927	512,817
Tests:						
Hinton	479,986	494,766	492,224	474,553	473,048	478,422
Rapid Hinton	7,243	–	–	–	–	–
Hinton Titr.— Penicillin	14,115	7,430	9,230	8,454	10,075	10,642
Kahn Titr.— Penicillin	13,529	–	–	–	–	–
Davies - Hinton Micro	14,147	13,991	13,563	12,437	11,564	8,987
*Brucella Abortus Agglutination	24,895	24,755	31,776	29,633	35,539	14,756
*Glanders	11	15	8	7	13	10
Spinal Fluid:						
Number of Specimens	11,057	9,974	10,336	9,767	9,369	8,914
Tests:						
Wassermann	8,033	–	–	–	–	–
Davies-Hinton	11,057	9,974	10,336	9,767	9,369	8,914
Globulin	–	–	859	5,032	4,675	3,583
Total Protein	–	–	663	4,207	4,184	3,710
Rabies Diagnosis*:						
Number of Specimens	189	168	156	182	216	167
Tests:						
Impressions	189	168	156	182	216	167
Sections	181	158	149	172	199	152
Animal Inoculations	185	167	151	174	212	159
Total Tests	573,571	551,424	559,115	544,618	554,094	529,502
Total Specimens	544,644	551,095	557,293	535,024	539,512	521,898

*Diagnostic Examinations for Division of Livestock Disease Control.

BUREAU OF HOSPITAL FACILITIES

DIVISION OF HOSPITAL FACILITIES

Licensure

Improvement in the quality of patient care in hospitals and related facilities may be achieved by a variety of methods. In Massachusetts and other states, joint committees representing state hospital associations and medical societies have been established for this purpose. Better patient care is, of course, the ultimate goal of every hospital's medical, nursing and administrative staff. By the same token, accreditation by the Joint Commission on Hospital Accreditation is evidence that the approved institution has complied with a set of standards adopted by the representative national agencies which make up this agency. Similarly, the licensing program of the Massachusetts Department of Public Health has, as its primary purpose, improved medical care for the patient.

Since 1941, when our licensing program was established, there have been two major revisions of the regulations or standards adopted to implement the licensure law. As the standard of care in Massachusetts hospitals has improved, there has been a gradual but constant upgrading of our hospital regulations. The last such revision occurred in 1950, and it is proposed, in this paper, to present the progress in Massachusetts which has taken place in the institutions of the State since that time.

Although hospital licensure was the primary objective of the program at its inception in 1941, its scope has been broadened gradually to encompass all medical-care facilities within the Commonwealth. Supervision of clinics and dispensaries became the responsibility of the Division of Hospital Facilities in 1944. In 1948, the hospital licensing law was extended to include nursing or convalescent homes and boarding homes for the aged, as public opinion demanded better medical care for all who needed it. Licensure of city and town infirmaries instituted by the Massachusetts Legislature in 1953 was added to the responsibilities of the Division of Hospital Facilities. To conform with national legislative amendments concerning public assistance laws, approval of public medical institutions for the care of old age patients as well as for those with permanent or total disability became an added responsibility of this division in 1953. Similarly, when the use of blood transfusion and of blood derivatives increased in medical practice, approval and certification of blood banks in licensed hospitals became an added feature of the licensure program.

Another significant aspect of the licensure law in Massachusetts is the classification of hospitals. Thus, as new types of medical-care facilities come into existence, they too come under the sphere of the licensing law. Institutions for the care of noncommittable alcoholics may be cited as an example. Such institutions, prior to State licensure, were in existence without being under the supervision of any State or local agency. They were not even required to comply with fire and safety laws. As these institutions were incorporated into the licensing program, improvements in them became inevitable.

Although improvements in facilities and patient care in hospitals have been constant since 1941, the most significant changes have occurred since the 1950 revision of the regulations. The major problems which confronted the staff of the licensing division may be divided into two categories, the first being related to the physical aspect of the hospital plant and the second to medical and nursing care. It is conceded, however, that there is a very close tie between the two.

During World War II and the years immediately following its conclusion, hospital construction, including major alterations, had come to a complete standstill. Physical plants had deteriorated to varying extents. Many hospitals, over the years, had been improvised from private dwellings. Not infrequently the buildings were overcrowded, inadequate in patient and medical service facilities and constituted real fire hazards. Because a large number of our Massachusetts hospitals had been built at the turn of the century, obsolescence became a real problem. A

significant proportion of all hospital beds were contained in non-fire-resistant buildings, considered hazardous by the licensing agency as well as hospital trustees.

Problems presented themselves in all departments of the hospital. Maternity wards were overcrowded and in some hospitals delivery suites were not segregated as required by the accrediting agency, as well as the Department's regulations. There were insufficient labor rooms and overcrowding was apparent in newborn nurseries. In one nursery, for example, located on the top story of a non-fire-resistant building, 76 bassinets for newborn infants were contained in one large area.

Problems were also encountered in surgical departments. Operating rooms were small; floors, electric outlets and equipment in the operating room were not in accordance with the standards aimed at the prevention of explosions. In some instances, surgery was not segregated from other parts of the hospital. Not infrequently, scrub-up and sub-sterilizing areas were inadequate, while the whole operating area was subjected to extremes of temperature, too cold in the winter and too hot in the summer, conditions unfavorable both for personnel and for patients. Overcrowding in kitchens and subsequent lack of sanitation were noted in some hospitals. Many ward kitchens had become obsolete and unsuitable. Utility rooms were sometimes poorly equipped, small and inconveniently located. Patient areas, too, were overcrowded. Beds were very often found in corridors, and in at least two hospitals bassinets and cribs were found in rooms with beds for adult patients.

In some instances, areas designated for laboratory and x-ray departments had not been enlarged, as the rest of the hospital had been expanded and had become hopelessly inadequate. Not infrequently outpatient departments had been added in the basement or in other areas previously used for storage. Such areas constituted poor facilities for outpatient departments and resulted in the loss of usable storage area.

Apart from physical plant, the problems presented themselves in other spheres. Of these, inadequacies in medical records were prominent. Shortages of medical and nursing personnel during the war had lowered the quality of medical records in many hospitals. Having become accustomed to such a pattern, it was extremely difficult to alter such habits. In some instances it was found that large numbers of records had not been completed and tissue and record committees had not been active. This problem was particularly acute in hospitals which, in the past, had not sought accreditation by the American College of Surgeons, the agency then responsible for this function. Shortages in nursing personnel, which had become apparent during and immediately after the war, were aggravated as time went on. To an ever increasing extent, nonprofessional personnel had been utilized in hospitals, sometimes for professional services. Deterioration in nursing technique and care was often the inevitable result. Complaints from patients concerning lack of nursing care in the hospital became very common.

When the Department assumed responsibility for the licensing of nursing homes and boarding homes for the aged, it soon became apparent that this was to be no easy task. Although there were a number of good homes, many were obviously poor. Among the more pressing problems in such homes were shortages of personnel, poor sanitation and patient accommodation, inadequate medical supervision, nursing care, nutrition and equipment. There were those who felt that lack of adequate facilities for rehabilitation was a serious inadequacy in such homes. While this was true in general, it became apparent to the staff of the Division that, since the average age of patients in nursing homes and residents in boarding homes was in the vicinity of 70 years, rehabilitation in the sense of physical restoration for job training and employment was an unrealistic goal.

While there was an acute need for better recreational facilities in these homes, the most urgent need was to improve the environment and to provide for a clean, comfortable home with adequate food, nursing care and freedom from abuse. The achievement of this goal became the immediate objective in this area.

When it was established by study that 60 per cent of the persons in nursing homes and boarding homes were cared for by public assistance and that many better homes could accept but a small proportion of public assistance patients

because of the low rates paid for their care, difficulties in this regard became even greater. If standards were to be pushed too rapidly by the Department of Public Health, greater limitations on the number of public assistance patients would have been imposed by home owners.

When the General Court added the licensing of city and town infirmaries, this soon constituted a considerable portion of the Division's activities. Prior to 1953, the Department of Public Welfare could only make recommendations to local welfare boards regarding these infirmaries. Rarely, if ever, were this Department's recommendations carried out. If the status of nursing and boarding homes in 1948 were to be described as poor, then conditions in city and town infirmaries in 1953, utilizing the same standards, would have to be considered deplorable. It is difficult to put into words the sorry conditions found in many infirmaries. In one such institution, erected early in the nineteenth century, bricks falling from a crumpling wall constituted a hazard not only to the residents of the home but to persons passing by in the neighborhood. In some instances, the Department of Public Safety had refused to issue certificates indicating compliance with minimum standards in regard to fire and egress. In one community the local board of health had made violent protests to the welfare department in regard to the continued occupancy of the local infirmary by human beings. No attention had been paid to the pleas of the board of health, because no licensing law was in effect. Life in many of these institutions may properly be described as bare existence.

In presenting improvements which have occurred in institutions licensed by the Department of Public Health, it must be borne in mind that agencies other than the Division of Hospital Facilities have had similar goals. Hospital trustees have taken an active role in this connection. The Massachusetts Hospital Association, too, has proceeded with its very vigorous program. Furthermore, material improvement has been achieved by the efforts of the Joint Commission on Accreditation. In this connection, it must, however, be pointed out that significant progress in hospitals which have not sought accreditation by the Joint Commission has also been achieved. It would appear that the Joint Commission has been devoting considerable effort in the field of improved hospital records. It is, however, difficult for a national agency of this type to maintain day-by-day supervision over the wide scope of hospital activities. The Hill-Burton Program of the 79th Congress has been another very significant factor in improving hospitals.

Activity of the Division of Hospital Facilities in the field of hospital licensure is reflected, to some extent, by the number of closures of institutions which have been unable to meet the Department's standards. Between 1941 and 1949 there were a total of 30 hospital closures. Since 1950, the number has increased to 51. For the most part, these closures have occurred among small private hospitals which could not acquire sufficient financial resources with which to meet the Department's minimum requirements. A certain number of proprietary hospitals have, however, taken active measures to satisfy the regulations of the Department of Public Health and have remained in operation. It is noteworthy that accreditation by the Joint Commission has been acquired by at least three such hospitals during the past two or three years.

During the past five years, 18 new hospitals have been built in Massachusetts, while 34 additional institutions have had complete renovation of all service departments. Of the former number, 16 were Hill-Burton projects and, of the latter, 24 received Federal aid under this program. Only 19 hospitals have not undergone major physical alteration during this period. It is considered that 17 of this number merit attention along such lines. Encouragement by the Hospital Survey and Construction Program has been of considerable value in such situations and will continue to be for the duration of the program.

In several instances, hospitals, having been unable to comply with Department regulations in the general hospital classification, have elected to eliminate maternity or surgical sections. Hospitals from which maternity and surgical departments have been eliminated may make application for the classification chronic disease hospital. The need for such facilities is very urgent throughout the State. A summary of improvements in 144 hospitals is noted in Table I. It is apparent

that major improvements have taken place in all departments of licensed hospitals. It will be noted, for example, that of 121 hospitals with maternity wards, 65 or 52 per cent have been brought up to standard. Of this number, 53 or 43 per cent received Federal aid under the Hill-Burton Program. In the same manner, in 82 (68 per cent) of 121 hospitals, new additions or major alterations provided newborn nurseries which comply with recognized standards. Of 144 hospitals with operating suites, 89 or 61 per cent are now in accordance with minimum regulations. Improvements for each department are recorded in Table I.

TABLE I — *Improvements in General Hospitals in Massachusetts by Department*

Departments or Services	Number of Departments or Services Available	Improvements in Services or Departments		Improvements Aided by Federal Funds	
		Number	Per Cent	Number	Per Cent
Maternity Bed Areas	121	65	52.9	53	43.9
Delivery Suites	121	76	62.8	57	47.1
Newborn Nurseries	121	84	68.3	57	46.3
Medical and Surgical Wards	144	119	82.6	54	49.3
Operating Suites	144	89	61.8	59	40.9
X-ray Departments	144	95	65.9	58	40.3
Clinical Laboratories	144	89	61.8	58	40.3
OPD including Emergency	118	51	43.2	40	33.9
Kitchen Faciltites	144	79	54.9	52	36.1

In 1949, of a total of 17,278 general hospital beds in Massachusetts, 8085 (46 per cent) were nonacceptable, according to standards established by the United States Public Health Service in the regulations set up under the Hill-Burton Program. In 1956, the total number of general hospital beds increased to 19,356 and only 5823 or 30 per cent were nonacceptable.

Apart from physical plant, upgrading has occurred in other areas. Records have been improved, both in hospitals accredited by the Joint Commission as well as in those which have not sought accreditation. Further progress in this area will result from recent legislation empowering the Department to make examination of records, as well as of staff qualifications at the expense of the hospitals. Considerable attention has been paid to medical staffing patterns in hospitals by the Division. In one instance, hospital closure by the Department was averted by a major reorganization of the medical staff by the board of trustees of the hospital.

Improvements in other areas have also occurred. With the cooperation of the Blood Bank Committee of the Massachusetts Medical Society, there has been a complete revision of the Department's regulations for the operation of blood banks. Similarly, emergency medical coverage has been stressed by the inspectional staff. Pharmacies and central supply areas have also been improved. Results in many other areas have been gratifying. The demand for assistance and guidance, available through the staff of the Division of Hospital Facilities, is steadily growing.

Improvement in all phases of nursing and boarding home operation has become apparent during the past five years. This has been most marked in areas where the inspectional staff has been concentrating its activities, namely in housekeeping, nutrition, records and nursing care. It is expected that a recent revision of nursing home regulations will result in additional improvement in nursing homes. Formal revision of boarding home regulations is presently under way.

The Division has been aided in its work by the cooperation of the Massachusetts Federation of Nursing Homes, on the one hand, and the Massachusetts Federation of Rest Homes, on the other. Short courses and seminars have been held jointly with these organizations, the purpose of which has been better care in these institutions.

In 1955, the Department of Public Welfare increased the rate of payment for public assistance cases. This has been of considerable value in bettering conditions in these homes. In the administration of the nursing and boarding home program, considerable credit is due to the cooperative efforts of the Department of Public Safety, and local boards of health and welfare. The assistance of these, and other agencies, has been invaluable.

An intensive effort has been devoted by the staff of the Division to the licensing of city and town infirmaries. Since 1953, 17 infirmaries have been closed by the Department or have closed voluntarily. Improvement in some of these institutions has been slow, but progress has been noted. In a small number of institutions, major problems still exist.

In spite of the many difficulties which have presented themselves in the Department's licensing program and in spite of the small number of workers available to the Department for the administration of the program, achievements have been gratifying in terms of better patient care in the many institutions licensed by the Department. Supervision of medical-care activity is a relatively new responsibility for public health. However, it is apparent that the public, legislators and the profession itself are gradually learning the lesson that better medical care, in the long run, means better public health.

Hospital Survey and Construction

Developing the State Plan

The first State Plan for the administration of Public Law 725 (Hill-Burton Program), which was published in 1947, was subsequently revised to take into account obsolescent and substandard facilities. A certain proportion of the general hospital buildings in the State had been constructed at the turn of the century and were considered obsolescent according to modern standards. Some buildings were of frame construction or substandard in other respects.

Subsequent revisions of the Plan considered not only obsolescence but the adequacy of the major departments in hospitals. Consideration was given to such items as the surgical department, the maternity department, laboratories, x-ray facilities, kitchens, dining rooms, power plants, laundries and patients' service facilities, including elevators, diet kitchens and utility rooms. By this method the hospital's priority in the State Plan not only reflected its bed count, type and age of structure, but also afforded a complete evaluation of its patient and service facilities. This feature was unique in the Massachusetts Plan.

In addition to the priority scheme established for general hospitals, special consideration was given in the Massachusetts Plan to certain other categories. It was found, early in the program, that a large proportion of the federal funds allotted to Massachusetts would be, of necessity, allocated to rural areas or to urban centers removed from Boston, where the teaching hospitals closely allied to the State's three medical schools are located. It was believed that the training program of these teaching hospitals was vital to the proper staffing of the steadily growing hospitals in the more peripheral areas of the State. For this reason teaching hospitals, closely associated with medical schools and providing, in addition, facilities for postgraduate study of interns, residents and graduates, were declared eligible for federal assistance under a separate category designated as "Teaching Hospitals."

Further, it became evident in 1947 that obstetric departments in many general hospitals and some maternity hospitals were inadequate from many points of view. It will be recalled that during 1946 and 1947 extreme overcrowding on maternity wards was associated with extensive outbreaks of diarrhea of the newborn, not only in Massachusetts, but in many other states. The hospital survey revealed, among other things, such inadequacies as non-segregation of delivery suites and maternity wards, lack of sufficient labor rooms and overcrowding in newborn nurseries. Because of these conditions, it was believed that alterations and improvements of such poor facilities should be encouraged with federal assistance. A special priority was therefore established whereby general hospitals, not otherwise holding a high priority and requiring essential improvements in the maternity departments, were declared eligible for participation in the hospital survey and construction program.

The survey of existing facilities revealed yet another problem. In several sections of the State it was found that frame dwellings had been converted into small general hospitals. Some of these buildings were overcrowded and inadequate in patient and medical service facilities and constituted real fire hazards. Fortunately, many of these buildings were located in hospital service areas that were subsequently found to hold high priority for federal assistance.

After a number of conferences with federal officials regarding the significance of several criteria used in the development of the Massachusetts State Plan (i.e., adequacy of hospital departments, obstetrical facilities, etc.), it was suggested that a new basis of determining acceptability of hospital beds be used — one that would be comparable to the standards being applied in other states.

Therefore, in developing the Plan in 1955, the number and acceptability of beds in a given hospital facility was based on two criteria only: (1) To be classified acceptable, a bed should occupy a hospital area of eighty square feet in a (2) building which is considered fireproof, semi-fireproof or of heavy timber construction (Section 301, Classification of Construction, National Fire Protective Association).

The Construction Program

Funds have been distributed for hospital and health-center construction since 1948, with a total allocation to Massachusetts of $16,660,000. Except for the fiscal year beginning July 1, 1953, when the annual appropriation was reduced to $65,000,000, at least $75,000,000 had been allocated annually throughout the country. In 1950 the appropriation had been doubled by an amendment to the law to $150,000,000 annually. However, with the advent of war in Korea, the appropriation was again reduced to the original figure of $75,000,000.

These funds have assisted 71 hospital construction projects throughout the State. Table I shows a breakdown of the projects under Public Law 725.

TABLE I — *Distribution of Projects Constructed Under Public Law 725, by Type of Medical Facility*

Type of Facility	Number of Projects	Number of Beds Added	Number of Bassinets Added	Bed Capacity on Completion	Bassinet Capacity on Completion
Maternity hospital	2	98	104	122	114
Teaching hospital	9	702	87	2,940	389
Other general hospital	46	3,082	437	6,171	1,264
Totals	57	3,882	628	9,233	1,767
Chronic disease hospital	9	1,002	–	1,803	–
Mental hospital	1	32	–	32	–
Public health center	3	–	–	–	–
Laboratory	1	–	–	–	–
Grand Totals	71	4,916	628	11,068	1,767

In July 1955 Massachusetts was allocated $388,790, its first annual grant under the so-called Wolverton Amendment providing funds for the construction of diagnostic and treatment centers, rehabilitation centers, non-profit nursing homes and chronic hospital beds.

The funds were distributed among five construction projects: (1) the Boston Dispensary Rehabilitation Institute; (2) the improvement and expansion of outpatient departments at Beverly and (3) Lawrence General Hospitals; (4) a chronic disease research unit at the Peter Bent Brigham Hospital; (5) a psychiatric research unit for children at the new Judge Baker Guidance Center.

A significant milestone in interstate cooperation was achieved when Maine and Vermont each assigned the Boston Dispensary Project $100,000, their own 1955 allotment for rehabilitation centers.

General Hospitals

Fifty-seven general hospital projects received federal assistance. Ten of these were completely new facilities. These were in Needham, Athol, Milton, Clinton, Palmer, Lynn, Groton, Springfield, Webster, Danvers and Nantucket. Athol had not previously had a hospital. Almost all enjoy occupancy rates well over 70 per cent. Of the 57 general hospitals, nine were teaching hospitals and another two were maternity hospitals. Of the latter, one project, the Wesson Maternity Hospital in Springfield, was completely new, making it possible for two general hospitals in Springfield to close their inadequate maternity departments.

Consideration of the regional distribution of projects shows that 58.1 per cent of the money was allocated to the Greater Boston Region; 13.0 per cent to the Springfield; 16.1 per cent to the Worcester; 7.1 per cent to the Beverly-Salem; 4.2 per cent to the Barnstable; and 1.5 per cent to the Pittsfield Region. It is reassuring to note that by and large there is a fair degree of correlation between the percentage distribution of funds and the population density. In this connection, it must be realized that the priority scheme for general hospitals, which is based on existing, suitable beds and other lesser factors as well as population density, might in some instances fail to support the correlation of new hospital construction and population density.

Most of the general hospital beds were added in intermediate urban areas surrounding Boston, Worcester and Springfield. Of the 3882 general hospital beds, 446 (11.4 per cent) were built in rural areas (population less than 25,000).

The re-survey of beds in 1955 revealed that there are 13,467 acceptable general hospital beds, the lowest reported since 1949, despite the fact that about 4000 beds have been built with federal assistance since that time. Table II shows the tabulation of acceptable and nonacceptable general hospital beds during the past seven years.

TABLE II — *Existing Acceptable and Nonacceptable General Hospital Beds by Years*

	1949	1950	1951	1952	1953	1954	1955
Acceptable . . .	13,006	13,653	15,422	15,368	15,739	16,197	13,467
Nonacceptable . .	4,990	4,990	4,581	5,705	4,344	3,817	5,998

Using the federal allowance of 4.5 beds per thousand population, Massachusetts needs 24,078 beds, indicating an acceptable bed deficit of 10,611.

Chronic Disease Hospitals and Nursing Homes

Nine projects were approved for chronic disease hospitals. The Municipal Hospital in Springfield is the largest chronic disease hospital to be constructed in Massachusetts with Federal aid. The operation of this 463-bed facility by a community the size of Springfield constitutes a new departure in medical care. The progress of this hospital is being closely watched.

In November 1955 a new chronic disease unit was opened in Holyoke, replacing a typical city infirmary. This institution is providing care not only to welfare recipients, but also to private patients in Holyoke and neighboring communities. Large multiple-bed wards have made it possible to erect a hospital of 120 beds at a cost slightly in excess of $1,000,000.

Other chronic disease projects consisted of additions to five existing general hospitals providing a total of 355 beds for short-term care of patients with chronic disease. These are located at the Children's Medical Center and the New England Deaconess Hospital in Boston; the New England Sanatorium and Hospital in Stoneham; the Malden and Cape Cod Hospitals. Also 34 chronic beds were added to an existing tuberculosis hospital in Barnstable County and 50 beds were added to the Jewish Memorial Hospital, a long-term chronic facility in Boston.

The same standard of acceptability was applied to chronic disease beds as with the general hospital beds in the 1955 survey. This also resulted in a new low count for chronic beds; namely 2628. This compares with an overall need of 9944 chronic beds based on the federal standard of two beds per thousand population, or a deficit of 7316 beds. Notwithstanding this substantial shortage of chronic disease beds, there has not been much interest in the construction of chronic disease facilities.

All project applications in this category have been granted.

It is apparent that the 5332 acceptable and nonacceptable chronic disease beds in the State provide for only a small portion of the patients requiring such care.

Nursing homes in Massachusetts presently make available 14,685 beds for patients requiring long-term care. Only 302 of these beds are acceptable. The

federal standard of providing three nursing home beds per thousand population indicates that the State has a deficit of approximately 14,000 acceptable beds in this category.

Teaching Hospitals

Funds were made available to the majority of the teaching-hospital projects primarily for the purchase of equipment. A few were construction projects. At the Massachusetts Eye and Ear Infirmary, operating rooms were constructed and 22 beds were added. Projects at the Peter Bent Brigham Hospital provided 39 additional beds, six beds for intensive chronic disease research, and expanded outpatient department facilities. At the Boston Lying-in Hospital several clinics were added in the outpatient department, and at the New England Center Hospital the construction of a new pathology department was started with federal funds. The Massachusetts General Hospital is constructing a new Medical Science Building with 20 research beds under the program.

Tuberculosis Hospitals

There have not been any beds constructed in this program for tuberculosis patients as such.

A survey of tuberculosis beds was not undertaken in 1955, the data being taken from a previous survey in 1953. According to the latter survey, there are 2534 tuberculosis beds in the State. This compares with a computed need of 3282 beds, based on a formula recommended by the Public Health Service which allows 1.5 beds for each of the annual number of new cases for the latest two-year period.

However, no new tuberculosis beds are being programmed in the State in spite of the fact that many of the existing facilities are badly outmoded. Faced with a steadily declining census, most tuberculosis hospitals are inclined to admit other types of patients such as those with chronic disease. What this change in basic policy entails in the way of physical plant remains to be seen.

Mental Hospitals

One mental health facility project has been assisted in this program; namely, a four-story, 32-bed psychiatric unit for boys and girls. This is the new Judge Baker Guidance Center being built on property adjacent to the Children's Medical Center.

State institutions for the mentally ill continue to suffer from severe crowding. On the basis of current population estimates, the State should have 24,860 mental hospital beds. Sixty-five per cent of this need has been met. Two of the seven new construction projects undertaken by the State Department of Mental Health have been completed: the project at Grafton with 297 beds and the one in Boston with 300 beds.

It is unlikely that federal construction funds available under this program will be used for State mental hospital facilities for some time. The need for new facilities in this category is so great that the limited funds available in this program would scarcely provide more than token sustenance.

Public Health Centers

It will be noted that, in spite of the dearth of public health centers throughout the State, only three were approved, the first in Quincy and the second in Brookline; the third, which is being planned in Amherst, will be under the jurisdiction of the University of Massachusetts. Although such construction holds a high priority in the State program, there has been little interest in this category on the part of city and town officials.

Diagnostic and Treatment Centers

Initial studies show that somewhat more than one-fifth of the State's population does not have easy access to outpatient clinics. Does this mean that these people have poorer medical services than those having outpatient clinics? Or are there other compensating factors in these "have-not" communities?

Until these questions can be answered communities which do not have outpatient clinics are being rated as having a greater need for these services than those that do have them. The formula for determining the priority in this category is therefore based on the average usage of existing clinics in the State and is derived from the relative need of all communities for these services obtained by comparing the population density with this average. Also in recognition of the value of the outpatient clinic as a teaching tool, teaching hospitals are given a high priority in this category.

Seventy per cent of the funds allocated to this category are being earmarked for general outpatient clinics or services, while 30 per cent are being set aside for child guidance and mental health clinics. These funds shall be interchangeable should the demand in either category be less than the funds available in a given year.

Rehabilitation Centers

A survey of all rehabilitation services available in the State has been made. The facilities include not only medical services for physical restoration, but vocational services such as special schools, sheltered and curative workshops.

Two rehabilitation centers have been programmed to provide for the needs of the eastern part of the State. It is anticipated that each center will be comprehensive in character, providing all facets of rehabilitation. The availability of three medical schools in the Boston area offers assurance that adequate personnel will be available to staff these centers in the several specialties. One of these centers is already under construction. In addition, rehabilitation centers are being programmed in Worcester and Springfield to provide comprehensive services for the western part of the State. It is expected that the availability of several large hospitals in Worcester and Springfield will make adequate staffing of a comprehensive rehabilitation program possible.

Both of these cities have an established agency offering a wide variety of rehabilitation services. In the case of Worcester the agency's major deficiency is the inadequacy of its facility. Springfield has an ideal facility, its deficiencies being related more to organization and administration.

Massachusetts State Plan

All expenditures for construction under this program continue to be made on the advice of the agency's 42-member Hospital Advisory Committee subject to final approval by the Public Health Council.

The major planning tool or guide used by the Division of Hospital Facilities for evaluating and approving applications for new hospital facilities is the Massachusetts State Plan. This is a major inventory of all hospital and medical facilities (profit as well as non-profit) in the State. Initially compiled by the Division of Hospital Facilities in 1947, the status of these facilities and the utilization of their services are brought up to date annually by field studies and statistical reports. The State Plan enables the Division's staff to evaluate the relative need of communities in the State for hospital beds and other medical facilities, and (thereby) fulfill its role as one of the Commonwealth's central planning agencies in the field of medical care.

BUREAU OF TUBERCULOSIS AND INSTITUTIONS

DIVISION OF SANATORIA AND TUBERCULOSIS

The six years covered by this cumulative report, July 1, 1949 through June 30, 1956, brought into sharp focus trends and developments of tuberculosis control whose origins were in the late 1940's. The anti-tuberculosis drugs were introduced at that time, and since then certain trends have been accelerated. The death rate, 9.4 in 1955 for all forms of tuberculosis, declined 56 per cent since 1950, while the case rate decreased only 23 per cent. The major decline occurred in "other forms" of tuberculosis. Here the death rate dropped 75 per cent. The newer drugs, particularly isonicotinic acid hydrozid (INH), contributed to this accomplishment. Tuberculous meningitis in previous years, once correctly diagnosed, meant death. Now its sequelae persist to plague the ingenuity of the medical profession.

These six years have been exciting and challenging. Problems associated with tuberculosis in its treatment, public health practice, rehabilitation, hospital administration, and financing created a period in which constant evaluation of past practices was necessary. Two of the anti-tuberculosis drugs, which may be given in pill form, placed treatment in the home. The private physician was being forced into a field previously dominated by a small group of specialists. Newer and more effective methods of educating the lay person and the professional in tuberculosis control and rehabilitation were made necessary.

Standard methods of treatment such as pneumothorax, effective in the past, were discarded. Prolonged periods of bed rest and hospitalization were no longer necessary. The anti-tuberculosis drugs were given over longer periods of time, one and a half to two years and longer. Surgical resection, i.e., a removal of a small portion of the lung, developed as the preferred procedure in conjunction with rest and the drugs.

More patients being treated for shorter periods in sanatoria, combined with a sky-rocketing cost of hospitalization, plagued the hospital administrator and those engaged in financing these institutions. How should the vacant beds, at times as high as 50 per cent of capacity, be used to best advantage? Legislation was enacted to permit the signing of appropriate contracts between various agencies. In this way, Burbank Hospital in Fitchburg, Belmont Hospital in Worcester, the Springfield Health Department Tuberculosis Hospital and Brookline Tuberculosis Hospital were closed and the tuberculous treated elsewhere.

Associated with the decline in the number of deaths was a slower decline in new cases reported annually. Actually there was an increased prevalence of tuberculosis in the older age groups. The tuberculin test proved that there was less infection in school children as compared to thirty years ago. A tuberculin testing program done in the school population of Lowell and elsewhere indicated a marked decline in the percentage of positive reactors from 30 per cent to 2-plus per cent.

During this period it became apparent that tuberculosis was being found more frequently in special groups — the lower socioeconomic groups, particularly males over 40; certain racial groups, and large urban populations as compared to rural.

Large population groups are reaching adult life without being exposed to tuberculosis. For this reason a significant change was necessary in tuberculosis case finding methods. Greater attention was required in selecting groups with a higher prevalence of unrecognized tuberculosis. Efforts were concentrated in certain areas of the larger cities, in nursing homes, jails, hospitals, "flop houses" and in certain racial groups.

A bill sponsored by this Division was enacted in 1951 but repealed before becoming effective. It established the State as the principal agency responsible for tuberculosis control on a State-wide basis.

Federal grants, markedly cut during this period, still remain a vital prop in Massachusetts tuberculosis control. Through the use of these funds tuberculosis case registers have been established in many new communities, and there has been a sweeping reorganization of the tuberculosis case reporting system.

The schools for the training of licensed practical nurses, the educational programs for affiliate nurses, in-service training and other similar programs were emphasized, enlarged and improved. Had it not been for these programs and the subsequent recruitment of nurses, the Departmental hospitals would have found survival difficult indeed.

School personnel were required every three years to be certified free of tuberculosis in a communicable form under Chapter 732 of the Acts of 1950.

Dr. Alton S. Pope, Director of the Division of Tuberculosis and Sanatoria and Deputy Commissioner of the Department of Public Health, retired July 31, 1954, after thirty years of dedicated service to the community. Such men as he are irreplaceable.

The poliomyelitis epidemic in 1955, which required the mobilization of all resources throughout the State, produced a lasting example of community responsibility and consciousness in admirably meeting a prolonged and difficult crisis. Lakeville State Sanatorium, Lemuel Shattuck Hospital, and Massachusetts Hospital School contributed greatly to this general effort.

Departmental Institutions

Lakeville State Sanatorium

With the decline in the number of cases with orthopedic tuberculosis it was possible to admit more patients with other crippling conditions. The needs of the community were acknowledged when enabling legislation permitted the admission of patients with arthritis, neuromuscular disorders, aging persons and those with other conditions requiring physiotherapy and long-term care.

Treatment plans for the arthritics were developed in close cooperation with the Massachusetts General Hospital. This service has proved of great value and is steadily expanding. A limited number of patients with multiple sclerosis are treated.

A special unit for children with cerebral palsy and an I.Q. of between 50 and 80 has been established. A service for the correction of orthopedic defects in children confined to mental institutions has been created.

Rehabilitation has been increasingly stressed through surgery, orthopedic appliances and physiotherapy. The rising trend in the average daily census of patients at the sanatorium gives evidence of the increased demand for these services.

The appended tables (I through IV) show a 50 per cent drop in the tuberculosis patient census, particularly in children, during this period. The remaining tables demonstrate fluctuations in admission of other conditions with the daily patient census increased to meet increased community needs.

Lemuel Shattuck Hospital

The Lemuel Shattuck Hospital opened for patients on October 4, 1954. The hospital population expanded steadily until 253 beds were in operation. Further expansion has been prevented by the lack of registered nurses.

On August 17, 1955 a temporary polio respirator unit was established, and on November 6, 1956 this was moved to permanent quarters on the seventh floor of the hospital.

In addition to the care of patients, special laboratories for the study of chronic pulmonary disease, hypertension, radioisotopes, and biochemistry are in operation. Eight research projects are now under way. Teaching and training have progressed steadily.

The hospital was accredited by the Joint Board on November 18, 1955 and approved for residency training in internal medicine and pathology in 1956. Residency affiliation with the Beth Israel, Boston Veterans Administration, Mount Auburn, Massachusetts General and New England Medical Center hospitals is now in operation. Students from Harvard, Tufts and Boston University Medical Schools and the Harvard School of Public Health come to the hospital regularly.

The School of Licensed Practical Nurses began operation in September 1956 and will graduate its first class early in 1958.

Massachusetts Hospital School

In 1954 the Legislature transferred this excellent institution to the Department of Public Health. A Resident School, in which is integrated a small hospital, admits physically handicapped children who are unable to attend public school, whose medical treatment would interfere with continued schooling, or whose medical care warrants long-term hospital treatment. Admission policies of this school and of Lakeville have been integrated so that no duplication of objectives exists. Children from the age of three to twenty-one are treated, and remain as patients as long as continued improvement is observed. Although improvement in the physical plant has taken place, further expansion is necessary if the needs of the community are to be met.

North Reading State Sanatorium

The 26-bed unit for children with rheumatic heart disease which was opened at North Reading in April of 1949 was closed May 8, 1951. During the following fiscal year 1951–1952 a considerable backlog of tuberculosis patients were admitted. The daily average of patients for the period 1949 through June 30, 1956 ranged from 149 to 140.

The age-adjusted admission rates per 100,000 are shown below.

Age Group	1936	1946	1956
0–5	7.6	6.5	8.6
5–9	14.1	8.4	5.8
10–14	19.4	3.9	4.2
15–	10.5	2.4	3.4

It will be noted that the admission rate for children 0–5 years of age has been maintained. The rates for older children fell sharply between 1936 and 1946 and then remained fairly constant. The reasons for this are not clearly understood. One fact should be stressed. Adults with a greater incidence of tuberculosis are responsible in large measure for transmitting the disease to the younger children who are of necessity in close contact with them.

Tables I, II, III and IV show there has been no appreciable change in the number of admissions during this period. There has been a noticeable increase in the ratio of younger children; fifty per cent were under five years of age.

Pondville Hospital

During the years between 1949 and 1956 over two million dollars have been spent for the renovation of old buildings and new construction to provide adequate facilities for the expansion of the cancer control program at the Pondville Hospital. Thanks to the local Cancer Society, $10,000 established a research facility which was later dedicated as the Ira T. Nathanson Research Laboratory.

A Practical Nurses' Training School was created, and during this period ten classes were graduated, thus permitting us to increase our active bed capacity to one hundred patients. Our outpatient activity has continued to increase so greatly that a new general clinic was added weekly.

The Volunteer Social Service Committee established and equipped a chapel which is used for all denominations.

Numerous groups of students from the medical schools in Boston have attended our clinics for teaching purposes, and physicians, nurses and public health workers visited the hospital from 26 different states and 40 foreign countries.

The twenty-fifth anniversary of the opening of Pondville Hospital was celebrated on June 25, 1952.

In honor of our Chief of Staff, Dr. Ernest M. Daland, the Alumni Society was formed, consisting of all former resident doctors who trained at Pondville.

Following are a few statistics for the period:

	1950	1951	1952	1953	1954	1955
Admissions	982	1,122	1,334	1,261	1,391	1,567
Clinic visits — new	1,444	1,386	1,379	1,578	1,604	1,555
Clinic visits — return	8,608	8,814	10,411	11,444	11,937	12,675
Average period of hospitalization	22.5	20.5	17.8	21.4	24.1	22.1
Average number of patients	57.5	57.9	62.8	71.6	89.3	91.6
X-ray treatments	6,908	6,398	7,242	7,442	5,261	6,007
Operations	1,113	1,445	1,574	1,404	1,579	1,579
Laboratory tests	22,446	27,901	26,952	30,195	30,401	34,104

Rutland State Sanatorium

By 1949 we were able to evaluate some of the results of streptomycin therapy. Two hundred and thirty patients had already been treated with this antibiotic and the effects were remarkable. From that time on there was a sharp decline in pneumothorax therapy. Pneumoperitoneums, however, were continued for a few years. There are very few at present. Pulmonary function tests began in 1950 and have continued to date on an increasing number of patients.

Isonicotinic acid hydrazide came during 1952 and proved immediately to be as effective as streptomycin. As the years went by, drug therapy was extended to every patient and the time of administration was prolonged to a year, and then to two years.

Thoracoplasty as a collapse measure was abandoned during the years 1950–1953.

Our Rehabilitation Service has been kept with the help of a rehabilitation director, a librarian, a teacher and an occupational therapist. Our Social Service Department has also been functioning most of the time.

An intensive repair program has been carried out during the past eight years in an effort to bring the institution to modern physical standards.

Tables I and II show a marked increase in the male as compared to female admissions, as well as an increase in the average age of males. Most of the admissions were referred from general hospitals and the great majority of cases were far advanced.

Westfield State Sanatorium

The Westfield State Sanatorium has noted during this period the following changes: In the physical plant, since farm operations contribute nothing to patient rehabilitation, the unprofitable farm was closed on April 19, 1951. As of November 17, 1955, the electrical generators were changed to alternating current and linked with a public utility supply.

In professional training, on January 4, 1950 the School for Practical Nurses opened. Its students and graduates have helped to keep all 191 hospital beds open during nursing shortages. On July 1, 1953 the dental service was reorganized around a one-year internship. Slow progress is being made toward approval through affiliation for the residency in pathology. Approval of the three residencies in pulmonary diseases continues. Continued approval of the three residencies in cancer surgery hinges on making each the third-year affiliation in an approved four-year program.

In clinical services, on November 30, 1949 the hospital added radioactive cobalt to its cancer armamentarium. Full accreditation of the hospital was reaffirmed on September 12, 1955.

The Tuberculosis Section showed the same general trends as Rutland, whereas the Cancer Section showed a gradual increase in admissions, with females predominating.

LAKEVILLE STATE SANATORIUM

TABLE I — *Patient Census, December 31: Tuberculosis*

		1950	1951	1952	1953	1954	1955
Patient Census Dec. 31	Children: Male	17	15	14	12	5	6
	Female	14	9	14	13	6	6
	Adults	78	72	59	39	45	33
	Total	109	96	87	64	56	45

TABLE II — *Daily Average Number of Patients: Tuberculosis*

	1950	1951	1952	1953	1954	1955
Number	114.7	110.9	105.6	86.6	61.4	55.5

TABLE III — *Number of Patients Admitted and Discharged: Tuberculosis*

	1950	1951	1952	1953	1954	1955
Admissions	142	144	153	98	88	82
Discharges	132	157	162	120	95	93

TABLE IV — *Diagnosis on Admission: Bone and Joint Tuberculosis*

	Adults		Children		Total	Percent of All Admitted for Tuberculosis
	Male	Female	Male	Female		
1950*	18	6	3	5	32	22.5
1951*	11	11	6	4	32	22.5
1952*	16	9	3	5	33	21.6
1953	15	11	7	8	41	41.8
1954	10	13	5	2	30	34.1
1955	13	11	3	3	30	36.6

TABLE V — *Daily Average Number of Patients: Poliomyelitis*

	Adults		Children		
	Male	Female	Male	Female	Total
1950	3.7	7.2	11.8	5.4	28.1
1951	1.6	6.9	6.2	6.4	21.1
1952	1.3	5.3	3.5	3.3	13.4
1953	2.8	6.2	5.4	2.7	17.1
1954	1.4	4.1	9.6	6.6	21.7
1955	3.4	8.2	16.5	13.0	41.0

TABLE VI — *Female per Male Ratio: Adults, Poliomyelitis*

	1950	1951	1952	1953	1954	1955
Females per male	1.9	4.3	4.1	2.2	2.9	2.4

TABLE VII — *Stage of Disease: Poliomyelitis*

Stage	1950	1951	1952	1953	1954	1955
II	0	0	0	0	0	90
III	32	15	9	22	30	7
IV	7	9	12	9	4	6

*Vertebral column excepted.

TABLE VIII — *Admissions 30 Years of Age and Over: Poliomyelitis*

	30 and over	Total All Ages	Percent 30 and over
1950	4	41	29.8
1951	6	34	17.6
1952	5	21	23.8
1953	2	31	6.4
1954	3	34	8.8
1955	20	103	19.4
Total	40	264	15.2

TABLE IX — *Condition on Discharge: Poliomyelitis*

	Improved					
	Number	Percent	Unchanged	Dead	Non-Polio	Total
1950	48	98.0	1	0	0	49
1951	35	89.7	3	1	0	39
1952	12	70.6	5	0	0	17
1953	23	95.8	1	0	0	24
1954	27	93.1	0	2	0	29
1955	62	96.9	1	1	0	64
Total	207	93.2	11	4	0	222

TABLE X — *Daily Average Number of Patients, Crippled Children* (1950–1952) *Crippling Conditions* (*1953–1955*)

	Children			Adults			
	Male	Female	Total	Male	Female	Total	Total
1950	20.3	16.4	36.7	–	–	–	36.7
1951	25.9	18.0	43.9	–	–	–	43.9
1952	32.3	22.3	54.6	–	–	–	54.6
1953	25.9	27.2	53.1	1.5	8.2	9.7	62.8
1954	31.8	29.3	61.1	5.9	14.8	20.7	81.8
1955	29.8	31.3	61.1	7.9	21.5	29.4	90.5

TABLE XI — *Diagnosis on Admission, Crippled Children* (1950–1952) *Crippling Conditions* (1953–1955)

	Cerebrospastic Palsy		Congenital Dislocation and Deformities		Arthritis		All Other Crippling Conditions		Total
	No.	%	No.	%	No.	%	No.	%	
1950	42	62.7	13	19.4	–	–	12	17.9	67
1951	26	44.1	9	15.2	–	–	24	40.7	59
1952	31	47.0	8	12.1	–	–	27	40.9	66
1953	24	23.1	23	22.1	34	32.7	23	22.1	104
1954	19	15.8	17	14.2	44	36.7	40	33.3	120
1955	21	18.8	17	15.2	39	34.8	35	31.2	112
Total 1950–1955	163	30.9	87	16.5	117	22.2	161	30.5	528
Total 1953–1955	64	19.0	57	17.0	117	31.8	98	29.2	336

TABLE XII — *Daily Average Number of Patients: Tuberculosis, Poliomyelitis, Crippled Children and Crippling Conditions*

	Tuberculosis		Poliomyelitis		Crippled Children		Total
	No.	%	No.	%	No.	%	
1950	114.7	63.9	28.1	15.6	36.7	20.4	179.5
1951	110.9	63.0	21.1	12.0	43.9	25.0	175.9
1952	105.6	60.8	13.4	7.7	54.6	31.4	173.6
					Crippled Conditions		
1953	86.6	52.0	17.1	10.3	62.8	37.7	166.5
1954	61.4	37.2	21.7	13.2	81.8	49.6	164.9
1955	55.5	29.7	41.1	22.0	90.5	48.4	187.1
Average	89.1	51.0	23.8	13.6	61.7	35.3	174.6

NORTH READING STATE SANATORIUM

TABLE I — *Admissions and Discharges: Tuberculosis*

	Admitted	Discharged	Deaths*
1950	77	85	4
1951	99	85	1
1952	104	93	2
1953	95	103	2
1954	98	109	1
1955	105	101	1
Total	578	576	11

TABLE II — *Daily Average Number of Patients: Tuberculosis*

	Male	Female	Total
1950	65.60	64.06	129.66
1951	64.66	61.94	134.91
1952	73.05	81.60	154.64
1953	68.82	77.16	145.98
1954	78.79	65.84	144.63
1955	72.53	66.73	139.35
Average	70.58	69.55	141.53

TABLE III — *Patients Admitted 0–4 Years of Age: Tuberculosis*

	Male	Female	Total	%
1950	20	14	34	44
1951	24	26	50	50
1952	25	27	52	50
1953	26	18	44	46
1954	34	22	56	57
1955	30	39	59	51

TABLE IV — *Source of Referral: Tuberculosis*

	Referred by General Hospitals		Total Referred
	No.	% of Total	
1950	30	39.0	77
1951	37	37.4	99
1952	30	28.8	104
1953	34	35.8	95
1954	42	42.8	98
1955	36	34.3	105
Total	209	36.2	578

TABLE V — *Reason for Initial Examination of Tuberculosis Patients Admitted*

	X-Ray Survey or Other Case-finding Activity		Contact of a Known Case		Suspicious Signs or Symptoms		Routine Physical Examination		Total
	No.	%	No.	%	No.	%	No.	%	No.
1950	0	0.0	50	64.9	26	33.8	1	1.3	77
1951	0	0.0	74	74.7	23	23.2	2	2.0	99
1952	0	0.0	72	69.2	32	30.8	0	0.0	104
1953	0	0.0	67	70.5	28	29.5	0	0.0	95
1954	0	0.0	59	60.2	39	39.8	0	0.0	98
1955	1	1.0	83	79.0	21	20.0	0	0.0	105
Total	1	0.0	405	70.1	169	29.2	3	0.5	578

*Included in number discharged.

RUTLAND STATE SANATORIUM

TABLE I — *Daily Average Number of Patients*

	Male		Female		
	No.	%	No.	%	Total
1950	142.61	56.9	108.17	43.1	250.78
1951	140.17	64.7	76.55	35.3	216.72
1952	135.60	62.7	80.70	37.3	216.30
1953	148.79	70.7	61.57	29.3	210.36
1954	163.77	77.1	48.52	22.8	212.29
1955	165.94	77.2	49.10	22.8	215.04
Total	896.88	–	424.61	–	1321.49
Average	149.48	67.9	70.77	32.1	220.25

TABLE II — *Median Age of Patients Admitted*

	Male	Female	Total
1950	40–49	20–29	30–39
1951	40–49	30–39	40–49
1952	40–49	20–29	40–49
1953	40–49	30–39	40–49
1954	50–59	30–39	40–49
1955	50–54	45–49	45–49

Table III — *Extent of Disease on Admission of Patients*

	Minimal						Moderately Advanced						Far Advanced						Total Pulmonary				
	Male		Female		Total		Male		Female		Total		Male		Female		Total		Male		Female		Total
	No.	% of Total Male	No.	% of Total Female	No.	% of Total Adm.	No.	% of Total Male	No.	% of Total Female	No.	% of Total Adm.	No.	% of Total Male	No.	% of Total Female	No.	% of Total Adm.	No.	% of Total Adm.	No.	% of Total Adm.	
1950	18	14.4	10	10.3	28	12.6	30	24.0	34	35.0	64	28.8	77	61.6	53	54.6	130	58.6	125	56.3	97	43.7	222
1951	3	2.4	7	12.5	10	5.5	33	26.2	21	37.5	54	29.7	90	71.4	28	50.0	118	64.8	126	69.2	56	30.8	182
1952	2	2.4	6	12.5	8	6.0	26	30.6	19	39.6	45	33.8	57	67.0	23	47.9	80	60.2	85	63.9	48	36.1	133
1953	18	10.3	14	23.3	32	13.7	45	25.9	20	33.3	65	27.8	111	63.8	26	43.3	137	58.5	174	74.4	60	25.6	234
1954	8	5.4	5	12.5	13	6.9	46	31.1	13	32.5	59	31.4	94	63.5	22	55.0	116	61.7	148	78.7	40	21.3	188
1955	16	8.4	9	16.7	25	10.2	53	27.7	20	37.0	73	29.8	122	63.9	25	46.3	147	60.0	191	78.0	54	22.0	245
Total	65	7.6	51	14.4	116	9.6	233	27.4	127	35.8	360	29.9	551	64.9	177	49.8	728	60.5	849	70.5	355	29.5	1204

Table IV — *Reason for Initial Examination of Patients Admitted*

	Contact with a Known Case						Suspicious Signs or Symptoms						X-ray Survey, Other Case Finding Activity or Routine Physical Examination						Total				
	Male		Female		Total		Male		Female		Total		Male		Female		Total		Male		Female		Total
	No.	% of Male	No.	% of Female	No.	% of Total	No.	% of Male	No.	% of Female	No.	% of Total	No.	% of Male	No.	% of Female	No.	% of Total	No.	% of Male	No.	% of Female	
1950	5	3.5	7	6.3	12	4.8	115	81.6	78	70.3	193	76.6	21	14.9	26	23.4	47	18.6	141	56.0	111	44.0	252
1951	3	2.2	10	14.3	13	6.4	119	89.5	52	74.3	171	84.2	11	8.3	8	11.4	19	9.4	133	65.6	70	34.5	203
1952	7	4.3	8	9.8	15	6.2	125	77.6	65	79.3	190	78.2	29	18.0	9	11.0	38	15.6	161	66.2	82	33.7	243
1953	3	1.6	1	1.5	4	1.6	171	91.9	53	84.1	224	90.0	12	6.4	9	14.3	21	8.4	186	74.7	63	25.3	249
1954	2	1.2	5	9.6	7	3.1	156	90.7	39	75.0	195	87.0	14	8.1	8	15.4	22	9.8	172	76.8	52	23.2	224
1955	7	3.5	8	13.8	15	5.8	156	78.4	41	70.7	197	76.6	36	18.1	9	15.5	45	17.5	199	77.4	58	22.6	257
Total	27	2.7	39	8.9	66	4.6	842	84.9	328	75.2	1170	81.9	123	12.4	69	15.8	192	13.4	992	69.5	436	30.5	1428

TABLE V — *Source of Referral of Patients Admitted*

	Private M.D. No.	%	San. Con. Clinic or O.P. Dept. No.	%	General Hospitals and Their O.P. Depts. No.	%	T.B. Sanatoriums by Transfer No.	%	Other Sources No.	%	Total No.
MALE											
1950	40	28.4	16	11.3	36	25.5	13	9.2	36	25.5	141
1951	25	18.8	6	4.5	69	51.9	5	3.8	28	21.0	133
1952	34	21.1	13	8.1	61	37.9	31	19.2	22	13.7	161
1953	50	26.9	6	3.2	90	48.4	22	11.8	18	9.7	186
1954	25	14.5	6	3.5	71	41.3	53	30.8	17	9.9	172
1955	39	19.6	1	0.5	111	55.8	27	13.6	21	10.6	199
Total	213	21.5	48	4.8	438	44.2	151	15.2	142	14.3	992
FEMALE											
1950	43	38.7	13	11.7	29	26.1	1	0.9	25	22.5	111
1951	25	35.7	6	8.6	21	30.0	2	2.8	16	22.8	70
1952	23	28.0	9	11.0	30	36.6	3	3.6	17	20.7	82
1953	18	28.6	3	4.8	29	46.0	5	7.9	8	12.7	63
1954	16	30.8	3	5.8	26	50.0	2	3.8	5	9.6	52
1955	13	22.4	2	3.4	28	48.3	7	12.1	8	13.8	58
Total	138	31.6	36	8.2	163	37.4	20	4.6	79	18.1	436
BOTH SEXES											
1950	83	32.9	29	11.5	65	25.8	14	5.6	61	24.2	252
1951	50	24.6	12	5.9	90	44.3	7	3.4	44	21.7	203
1952	57	23.4	22	9.0	91	37.4	34	14.0	39	16.0	243
1953	68	27.3	9	3.6	119	47.8	27	10.8	26	10.4	249
1954	41	18.3	9	4.0	97	43.3	55	24.6	22	9.8	224
1955	52	20.2	3	1.2	139	54.1	34	13.2	29	11.3	257
Total	351	24.6	84	5.9	601	42.1	171	12.0	221	15.5	1428

WESTFIELD STATE SANATORIUM

TABLE I — *Daily Average Number of Patients: Tuberculosis*

	Male No.	%	Female No.	%	Total
1950	64	48.5	68	51.5	132
1951	63	46.0	74	54.0	137
1952	63	48.5	67	51.5	130
1953	72	55.4	58	44.6	130
1954	76	62.3	46	37.7	122
1955	69	69.0	31	31.0	100
Total	407	–	344	–	751
Average	67.8	54.2	57.3	45.8	125.2

TABLE II — *Source of Referral of Patients Admitted: Tuberculosis*

	Private Doctor No.	%	San. Cons. Clinic or O.P. Dept. No.	%	General Hospitals and Their O.P. Depts. No.	%	Other Sanatoriums by Transfer No.	%	Other Sources No.	%	Total
1950	22	16.8	56	42.7	33	25.2	19	14.5	1	0.8	131
1951	22	20.0	60	54.5	17	15.4	10	9.1	1	0.9	110
1952	32	25.2	57	44.9	14	11.0	24	18.9	0	0.0	127
1953	27	20.1	54	40.3	26	19.4	27	20.1	0	0.0	134
1954	23	19.2	40	33.3	21	17.5	32	26.7	4	3.3	120
1955	45	38.5	16	13.7	27	23.1	12	10.2	17	14.5	117
Total	171	23.1	283	38.3	138	18.7	124	16.8	23	3.1	739

TABLE III — *Reason for Initial Examination of Patients Admitted: Tuberculosis*

	Contact with Known Case No.	%	Suspicious Signs or Symptoms No.	%	X-Ray Survey, Other Case-Finding Activity or Routine Physical Examination No.	%	Total
1950	2	1.5	96	73.3	33	25.2	131
1951	1	0.9	87	76.3	26	22.8	114
1952	1	0.8	27	21.2	99	78.0	127
1953	5	3.7	89	66.4	40	29.8	134
1954	2	1.7	94	78.3	24	20.0	120
1955	17	14.5	80	68.4	20	17.1	117
Total	28	3.8	473	63.7	242	32.6	743

TABLE IV — *Median Age of Patients Admitted: Tuberculosis*

	Male	Female	Total
1950	40–49	20–29	30–39
1951	50–59	30–39	40–49
1952	40–49	30–39	30–39
1953	40–49	30–39	40–49
1954	50–59	30–39	40–49
1955	50–59	30–39	40–49

TABLE V — *Daily Average Number of Patients: Cancer*

	Male		Female		Total
	No.	%	No.	%	
1950	15	46.9	17	53.1	32
1951	16	47.0	18	52.9	34
1952	16	47.0	18	52.9	34
1953	17	50.0	17	50.0	34
1954	17	47.2	19	52.8	36
1955	15	45.4	18	54.5	33
Total	96	–	107	–	203
Average	16.0	47.3	17.8	52.7	33.8

TABLE VI — *Number of Patients Admitted: Cancer*

	Male		Female		Total
	No.	%	No.	%	
1950	227	42.0	314	58.0	541
1951	335	48.5	356	51.5	691
1952	422	51.0	405	49.0	827
1953	400	48.8	419	51.2	819
1954	340	47.4	377	52.6	717
1955	277	40.6	406	59.4	683
Total	2001	46.8	2277	53.2	4278

TABLE VII — *Stage of Disease on Admission: Cancer*

		Early		Moderately Advanced		Advanced		Non-Malignant		Total	
		No.	% of Sex	No.	% of Sex	No.	% of Sex	No.	% of Sex	No.	% of Total
1950	Males	26	17.8	19	13.0	62	42.5	39	26.7	146	40.9
	Females	31	14.7	16	7.6	77	36.5	87	41.2	211	59.1
	Total	57	16.0	35	9.8	139	38.9	126	35.3	357	100.0
1951	Males	56	29.0	24	12.4	64	33.2	49	25.4	193	45.4
	Females	55	23.7	37	15.9	52	22.4	88	37.9	232	54.6
	Total	111	26.1	61	14.4	116	27.3	137	32.2	425	100.0
1952	Males	52	24.2	35	16.3	74	34.4	54	25.1	215	48.1
	Females	48	20.7	40	17.2	54	23.3	90	38.8	232	51.9
	Total	100	22.4	75	16.8	128	28.6	144	32.2	447	100.0
1953	Males	58	27.6	55	26.2	51	24.3	46	21.9	210	45.4
	Females	53	21.0	58	23.0	46	18.2	95	37.7	252	54.5
	Total	111	24.0	113	24.4	97	21.0	141	30.5	462	100.0
1954	Males	52	26.9	44	22.8	43	22.3	54	28.0	193	46.7
	Females	55	25.0	49	22.3	23	10.4	93	42.3	220	53.3
	Total	107	25.9	93	22.5	66	16.0	147	35.6	413	100.0
1955	Males	51	32.9	49	31.6	24	15.5	31	20.0	155	39.8
	Females	55	23.5	74	31.6	21	9.0	84	35.9	234	60.2
	Total	106	27.2	123	31.6	45	11.6	115	29.6	389	100.0
1950 to 1955	Males	295	26.5	226	20.3	318	28.6	273	24.6	1112	44.6
	Females	297	21.5	274	19.8	273	19.8	537	38.9	1381	55.4
	Total	592	23.7	500	20.0	591	23.7	810	32.5	2493	100.0

TABLE VIII — *Condition on Discharge: Cancer*

	Improved						Unimproved						Dead						Total Discharged				
	Male		Female		Total		Male		Female		Total		Male		Female		Total		Male		Female		Total
	No.	% of Total Male	No.	% of Total Female	No.	% of Total	No.	% of Total Male	No.	% of Total Female	No.	% of Total	No.	% of Total Male	No.	% of Total Female	No.	% of Total	No.	% of Total Male	No.	% of Total Female	
1950 . .	159	70.0	258	84.0	417	78.1	29	12.8	27	8.8	56	10.5	39	17.2	22	7.2	61	11.4	227	42.5	307	57.5	534
1951 . .	200	59.9	253	70.1	453	65.2	95	28.4	82	22.7	177	25.5	39	11.7	26	7.2	65	9.4	334	48.0	361	51.9	695
1952 . .	210	50.4	260	64.5	470	57.3	157	37.6	115	28.5	272	33.2	50	12.0	28	6.9	78	9.5	417	50.8	403	49.1	820
1953 . .	208	51.5	263	63.1	471	57.4	160	39.6	128	30.7	288	35.1	36	8.9	26	6.2	62	7.6	404	49.2	417	50.8	821
1954 . .	178	52.8	251	66.9	429	60.2	137	40.6	97	25.9	234	32.9	22	6.5	27	7.2	49	6.9	337	47.3	375	52.7	712
1955 . .	163	57.8	276	67.2	439	63.3	90	31.9	119	29.0	209	30.2	29	10.3	16	3.9	45	6.5	282	40.7	411	59.3	693
Total . .	1118	55.9	1561	68.6	2679	62.7	668	33.4	568	25.0	1236	28.9	215	10.7	145	6.4	360	8.4	2001	46.8	2274	53.2	4275

PONDVILLE HOSPITAL

TABLE I — *Daily Average Number of Patients: Cancer*

	Male		Female		Total
	No.	%	No.	%	
1950	32.1	53.0	28.4	46.9	60.5
1951	28.7	49.6	29.2	50.4	57.9
1952	31.0	49.4	31.8	50.6	62.8
1953	32.9	46.3	38.2	53.7	71.1
1954	36.8	41.2	52.5	58.8	89.3
1955	43.3	47.3	48.3	52.7	91.6
Average	34.1	47.2	38.1	52.8	72.2

TABLE II — *Patients Admitted: Cancer*

	Male		Female		Total
	No.	%	No.	%	
1950	398	40.5	584	59.5	982
1951	469	41.8	653	58.2	1122
1952	589	44.2	745	55.8	1334
1953	540	42.8	721	57.2	1261
1954	554	39.8	837	60.2	1391
1955	616	39.3	951	60.7	1567
Total	3166	41.3	4491	58.6	7657

TABLE III — *Stage of Disease on Admission: Cancer*

		Early		Moderately Advanced		Advanced		Non-Malignant		Unknown		Total	
	Sex	No.	% of Sex	No.	% of Sex	No.	% of Sex	No.	% of Sex	No.	% of Sex	No.	% of Total for Yr.
1950	Males	30	11.7	88	34.4	81	31.6	57	22.3	0	0.0	256	41.0
	Females	46	12.5	77	20.9	61	16.6	184	50.0	0	0.0	368	59.0
	Total	76	12.2	165	26.4	142	22.8	241	38.6	0	0.0	624	100
1951	Males	33	12.4	64	24.0	106	39.7	57	21.3	7	2.6	267	41.9
	Females	20	5.4	78	21.1	94	25.4	176	47.6	2	0.5	370	58.1
	Total	53	8.3	142	22.3	200	31.4	233	36.6	9	1.4	637	100
1952	Males	36	11.8	127	41.5	52	17.0	84	27.4	7	2.3	306	41.9
	Females	41	9.6	132	31.0	53	12.5	191	44.9	8	1.9	425	58.1
	Total	77	10.5	259	35.4	105	14.4	275	37.6	15	2.0	731	100
1953	Males	30	9.9	80	26.4	110	36.3	72	23.8	6	2.0	303*	42.9
	Females	41	10.2	66	16.4	127	31.5	160	39.7	3	0.7	403*	57.1
	Total	71	10.1	146	20.7	237	33.6	232	32.9	9	1.3	706*	100
1954	Males	36	12.4	59	20.4	114	39.4	67	23.2	9	3.1	289†	39.0
	Females	64	14.2	58	12.8	124	27.4	189	41.8	6	1.3	452†	61.0
	Total	100	13.5	117	15.8	238	32.1	256	34.5	15	2.0	741†	100
1955	Males	36	10.2	52	14.7	164	46.3	88	24.8	9	2.5	354†	43.6
	Females	37	8.1	78	17.1	134	29.3	194	42.4	7	1.5	457†	56.4
	Total	73	9.0	130	16.0	298	36.7	282	34.8	16	2.0	811‡	100
1950 to 1955	Males	201	11.3	470	26.5	627	35.3	425	23.9	38	2.1	1775	41.8
	Females	249	10.1	489	19.8	593	24.0	1094	44.2	26	1.0	2475	58.2
	Total	450	10.6	959	22.6	1220	28.7	1519	35.7	64	1.5	4250	100

*Including "post-therapy, no recurrence": 5 males, 6 females.
†Including "no disease": 4 males, 11 females.
‡Including "no disease, or no recurrence": 5 males, 7 females.

TABLE IV — *Condition on Discharge: Cancer*

	Improved					Unimproved					Dead					Total Discharged				
	Male		Female		Total	Male		Female		Total	Male		Female		Total	Male		Female		Total
	No.	% of Total Male	No.	% of Total Female	No. % of Total	No.	% of Total Male	No.	% of Total Female	No. % of Total	No.	% of Total Male	No.	% of Total Female	No. % of Total	No.	% of Total Male	No.	% of Total Female	
1950	277	73.3	463	79.3	740 76.9	79	20.9	88	15.1	167 17.4	22	5.8	33	5.6	55 5.7	378	39.3	584	60.7	962
1951	322	67.2	510	78.2	832 73.6	93	19.4	112	17.2	205 18.1	64	13.4	30	4.6	94 8.3	479	42.4	652	57.6	1131
1952	387	66.7	587	80.1	974 74.2	122	21.0	93	12.7	215 16.4	71	12.2	53	7.2	124 9.4	580	44.2	733	55.8	1313
1953	385	71.7	551	76.7	936 74.6	90	16.8	116	16.2	206 16.4	62	11.5	51	7.1	113 9.0	537	42.8	718	57.2	1255
1954	357	63.9	598	72.7	955 69.2	114	20.4	143	17.4	257 18.6	88	15.7	81	9.8	169 12.2	559	40.5	822	59.5	1381
1955	415	67.9	715	74.4	1130 71.9	101	16.5	151	15.7	252 16.0	95	15.5	95	9.9	190 12.1	611	38.9	961	61.1	1572
Total	2143	68.2	3424	76.6	5567 73.1	599	19.0	703	15.7	1302 17.1	402	12.8	343	7.7	745 9.8	3144	41.3	4470	58.7	7614

TABLE V — *Median Age of Patients Admitted: Cancer*

	Male	Female	Total
1950	60–69	50–59	50–59
1951	60–69	50–59	60–69
1952	60–69	50–59	60–69
1953	60–69	50–59	60–69
1954	60–69	50–59	60–69
1955	60–69	50–59	60–69

BUREAU OF ENVIRONMENTAL SANITATION

DIVISION OF SANITARY ENGINEERING

The work of the Division of Sanitary Engineering is carried out under four principal engineering sections and the Lawrence Experiment Station. The engineering sections consist of the water supply section, community sanitation section, atmospheric pollution and radiological health section, and pollution control section; under the community sanitation section are carried out the sanitary engineering activities of the four public health districts. At the Lawrence Experiment Station routine work is carried out in the chemical laboratory and the bacteriological laboratory, with a separate laboratory for research. The facilities of the chemical and bacteriological laboratories are available to the research laboratory. In addition to these three laboratories, the plumbing research laboratory recently established is engaged in the demonstration of the hydraulics of plumbing and the training of plumbers and plumbers' apprentices in the health features of plumbing; in this connection the trainees are afforded a general knowledge of the operation of the other sections of the Lawrence Experiment Station to emphasize the health features of proper plumbing.

In addition, to serve the western part of the State in special sanitary engineering activities, there is the Amherst laboratory at the headquarters of the Western Public Health District.

The following detailed report is arranged for the discussion of each of the several sections referred to above.

Routine Work

The routine activities of the Division of Sanitary Engineering have been as follows:

General advice to cities, towns and persons in matters of water supply, drainage, sewerage and sewage disposal.

Investigations leading to the adoption of rules and regulations for protecting sources of water supply and enforcement of such rules and regulations.

Investigations leading to removal of sources of pollution of water supplies.

Investigations relative to the efficiency of the operation of sewage treatment works.

Investigations relative to pollution of streams, examinations of sewer outlets, enforcement of legislation relating to pollution of certain streams and certain coastal waters.

Investigations relative to the use of emergency sources of water supply.

Approval of the acquisition of lands for protecting sources of water supply and lands for sewage treatment works.

Investigations as to effect of industrial wastes on sewers and sewage treatment works.

Investigations leading to approval of plans for police stations, lockups and houses of detention.

Investigations relative to offensive trades.

Investigations relative to the approval of the use of lands for cemetery purposes and for the construction of mausoleums and crematories.

Investigations leading to advice to cities, towns and persons in matters of bathing places, garbage and refuse disposal, nuisances, private water supplies and similar problems.

Investigations relative to sources of water supply where the water is bottled and sold or used in the manufacture of non-alcoholic beverages.

Investigations relative to pollution of water supplies by cross connections.

Investigations as to the location of public institutions.

Preparation of plans for water supply and sewerage for institutions of the Department and certain other State institutions.

Approval of municipal plumbing rules and regulations.

Investigations relative to the pollution of coastal waters from which shellfish are taken.

Investigations relative to sanitary conditions of shellfish-handling establishments and consideration of certificates of out-of-state shellfish shippers.

Investigations relative to the approval of shellfish purification plants and the operation thereof.

Representatives of the Division have participated in the Sanitation Courses at the University of Massachusetts. The work has included lectures, field trips and assistance to the faculty in the preparation of courses.

Representatives of the Division have from time to time given lectures on general sanitation matters at various hospitals throughout the State to classes of nurses in training.

Papers on the problem and solution of stream pollution have been presented to many civic and professional organizations throughout the State by engineers of this Division.

General advice to the Legislature in matters of water supply, drainage, sewerage and sewage disposal, shellfish and other environmental sanitation problems.

A representative of the Division of Sanitary Engineering has been appointed by the Commissioner of Public Health as a member of the State Reclamation Board, whose duties at present are largely concerned with the control of mosquitoes.

A representative of the Division of Sanitary Engineering also is appointed to represent the Commissioner of Public Health on the Water Resources Commission.

Changes in the law placed upon the Division of Sanitary Engineering the duty of making investigations relative to atmospheric pollution, and included within the Division the Division of Smoke Inspection for Smoke Inspection Districts.

With the release of radioisotopes to industry, hospitals and others under license by the Atomic Energy Commission, the Department of Public Health was given the duty of the control of the use of radioactive materials in Massachusetts, this duty being assigned within the Department to the Division of Sanitary Engineering.

The Division has been actively concerned in the location and condition of operation of municipal dumps, particularly in the city of Boston. A new law permits any person aggrieved by the assignment of the location of a dump by a local board of health to apply to the Department of Public Health for a hearing; following the hearing the Department may revoke or amend the assignment by the local board of health.

The Division has also been concerned in the examination of and advice relative to piggeries at the request of local boards of health.

Special Activities

Legislative Investigations

This Division has assisted in special investigations directed by the resolves of the Legislature during the period from 1949 to 1956.

Water Resources Board

A representative of the Division of Sanitary Engineering has been appointed to represent the Commissioner of Public Health on this Board, which was organized in 1956.

State Reclamation Board

During the six-year period covered by this report the State Reclamation Board, composed of a representative of the Department of Public Health, a representative of the Department of Agriculture and a person appointed by the Governor,

has held its regular meetings each month at which problems concerned with the maintenance of the salt marsh ditches, the operation of the mosquito control districts and the greenhead fly districts have been discussed and appropriate action taken whenever necessary.

During this period Chapter 433 of the Acts of 1955 was passed in amendment of Chapter 252 of the General Laws for the creation of a Greenhead Fly Control District in which the Commonwealth shares the cost to the extent of one-third based on the area of the communities involved. Two new mosquito control districts were authorized during this period. The Norfolk County Mosquito Control District was created under the authority of Chapter 431 of the Acts of 1956 and was in operation soon after approval of the act by the Governor. The Bristol County Mosquito Control District was authorized by Chapter 506 of the Acts of 1956 but never has been organized.

Civil Defense

July 1, 1950, to June 30, 1951

On July 20, 1950, His Excellency, the Governor, approved Chapter 639 of the Acts of 1950, which provided for a Civil Defense Agency in Massachusetts, which agency was activated by the Governor's Executive Order on August 18, 1950; and on December 16, 1950, the Governor proclaimed a state of emergency.

The Civil Defense Agency was organized in seven divisions including the Medical and Health Division. That Division was organized with 12 sections, one of which was the Environmental Sanitation Section. Under the general organization the State was divided into nine regions. The Division of Sanitary Engineering staffed State Headquarters and each regional headquarters with sanitary engineering personnel to operate in disaster under the Regional Medical Officers.

July 1, 1951, to June 30, 1952

The Environmental Sanitation Section held water works schools in September, October and November, 1951, in each of the nine regions. These schools were well attended by local water works personnel who were instructed in the use of emergency water chlorination apparatus and as to examination and selection of proper emergency sources of water supply should the public supplies be severely damaged.

In March, April and May of 1952 general sanitation schools also were held in each of the nine Civil Defense Regions.

July 1, 1952, to June 30, 1953

During this period all public water supply agencies were canvassed to determine the amount of emergency water supply equipment. This equipment was listed according to various types and also as to the regions in which it was located to facilitate its dispatch from one region to another.

During this period also manuals were prepared showing:

(1) The duties and organization of the Environmental Sanitation Section.
(2) Emergency Sanitation — Water Supply.
(3) Emergency Sanitation — Decontamination of areas affected by biological, chemical, gaseous and radiological sabotage or attack.
(4) Emergency Sanitation — General Sanitation.
(5) Milk and food sanitation, household supplies, mass feeding.

During this period also information was obtained as to local water works personnel and tabulations prepared showing those in charge of local public water supplies together with their office and home addresses.

Water treatment training equipment was purchased under matching funds including diatomaceous earth filters, pumps, canvass storage tanks and appurtenances for use in future water works schools.

On June 9, 1953, the Worcester tornado occurred and the Environmental Sanitation Section concentrated its field engineers in the Worcester area to assist in

water supply problems and to determine the amount of damage to water works. This included examinations in the city of Worcester and in the towns of Petersham, Barre, Holden, Rutland, Shrewsbury, Northborough, Westborough and Southborough and at the Rutland State Sanatorium of the Department of Public Health. The damage consisted of breaks in house services in damaged areas and loss of electric power. Adequate amounts of water were in storage on public water supply distribution systems so that early repair of power lines solved the problem of adequate water supply. In one instance, however, in the town of Northborough, the power failure made it impractical to operate the pumps and emergency pumps were obtained from the list of emergency equipment previously prepared by the section. In addition to examination of water supplies in the Worcester area examinations were made of the facilities for emergency feeding. No unsanitary practices were observed.

During this period also training in radiological monitoring was carried on by the Monitoring Section to which an engineer from the Division of Sanitary Engineering had been assigned. Regional monitoring consultants were trained in the use of monitoring equipment, and field exercises were carried out in the training of monitoring teams.

July 1, 1953, to June 30, 1954

During this period the Environmental Sanitation Section attended Civil Defense exercises at Civil Defense Headquarters at the Framingham State Police Training School in September, November and December, 1953, and on January 4, 1954.

In addition, on January 4, 1954, the Environmental Sanitation Section lectured at a meeting of the Massachusetts Public Health Association in Worcester to explain the functions of the Environmental Sanitation Section in Civil Defense.

On June 14 and 15, 1954, Operation Alert 1954 was held at Civil Defense Headquarters. The State and Regional Headquarters were staffed for this exercise by the Environmental Sanitation Section under the Medical Services.

July 1, 1954, to June 30, 1955

The Environmental Sanitation Section was called into service on August 31, 1954, with the appearance of Hurricane Carol and again on September 11, 1954, with the occurrence of Hurricane Edna.

On January 3, 1955, the Civil Defense Agency was reorganized. Under Executive Order No. 25 and Administrative Order No. 23, as amended, the Water Service was removed from the Medical Service and placed in charge of the Division of Sanitary Engineering of the Department of Public Health, the Chief Sanitary Engineer being appointed as Chief Water Officer. Under the reorganization the former nine regions were done away with and the State was redivided into four civil defense areas. The State Headquarters and each of the areas were staffed three-deep with waterworks personnel under the Chief Water Officer. The Sanitation Section under the Medical Service was also staffed for duty at the State and area headquarters in case of emergency.

The personnel of the Division of Sanitary Engineering in the Water Service and in the Sanitation Section of the Medical Service took part in Operation Alert 1955 on June 15 and 16, 1955.

July 1, 1955, to June 30, 1956

During this period whenever possible the Division of Sanitary Engineering in the two services attended weekly conferences at State Headquarters. The staff of the Division of Sanitary Engineering under the Water Service prepared maps showing present public water supplies in Massachusetts, rearranged according to Civil Defense areas the tabulation of emergency water supply equipment, prepared a complete revision of the listing of public water supply personnel and prepared a new manual of emergency water supply.

Again, in 1955, Massachusetts was visited by three hurricanes; on August 13 by "Connie," on August 17–19 by torrential rains accompanying Hurricane Diane

and by heavy rains occurring in October in company with Hurricane Edna. The torrential rains in August resulted in major damage in the central portion of the State and the Connecticut River Valley. The Division of Sanitary Engineering personnel assigned to the Water Service and Medical Service were in the field much of this time advising as to the rehabilitation of public water supplies and the eradication of nuisance conditions.

Operation Alert was planned for June, 1956, but was postponed to July 20 and 23, 1956.

Prior to Operation Alert 1956, a test was conducted on a token evacuation of Beacon Hill to the Framingham area.

Water Supply Section

Special Activities

During the post-war years the Water Supply Section took part in activities sponsored by the Massachusetts Civil Defense Agency. Following a reorganization of that agency a new section known as "Water Service" was established with a representative of this Division designated as Chief of that section. Several training schools have been conducted for water supply personnel throughout the State in an endeavor to work out a program to be used in the event of disaster, either by natural causes or by enemy action.

In 1954, two natural disasters occurred, the hurricane of August 31 and that of September 11. These both caused considerable damage to water supply installations. Many communities were without power for several days. The storms demonstrated the necessity of auxiliary pumping equipment for sources of supply which were supplied only with electric power. The personnel of the Division was on 24-hour standby duty during both disasters. Laboratory facilities were taxed and a large number of special samples were examined to determine that none of the public water supplies had become polluted.

In 1955, serious flooding occurred over a large part of the State as a result of heavy rainfall accompanying hurricane Diane in August. Damage to public water supplies, as a result of these floods, in the lower Connecticut River Valley exceeded $1,000,000. The damage to water supply systems throughout the State brought the total damage to about $2,500,000. During the flood and the rehabilitation following it, the Division assisted the damaged communities in providing safe water supplies by the installation of chlorinating apparatus and the transportation of water for drinking. Close contact was maintained with the Flood Relief Board in connection with the repair of damage to water supply systems.

Water Shortages

Following the severe drought of the year 1949, steps were taken by many communities to develop additional sources of water supply to meet increased water needs. However, shortages continued at a lesser rate during the years 1950–56, and in many instances the provisions of General Laws, Chapter 40, Section 41A, were invoked to give the right to public water supply agencies to shut off the water to consumers not showing cooperation in water conservation measures.

Public Water Supplies

On June 30, 1956, 273 of the 351 cities and towns of the Commonwealth were provided with public water supplies. However, there were 306 agencies engaged in this service, including municipal water departments, water districts, and water companies (Figure 1). There still remained 78 muncipalities not considered as having public water supplies, although in some of these there are public institutions which provide water to patients and employees, accounting for a considerable portion of the population of these communities. About 98 per cent of the population of Massachusetts reside in communities having public water supplies.

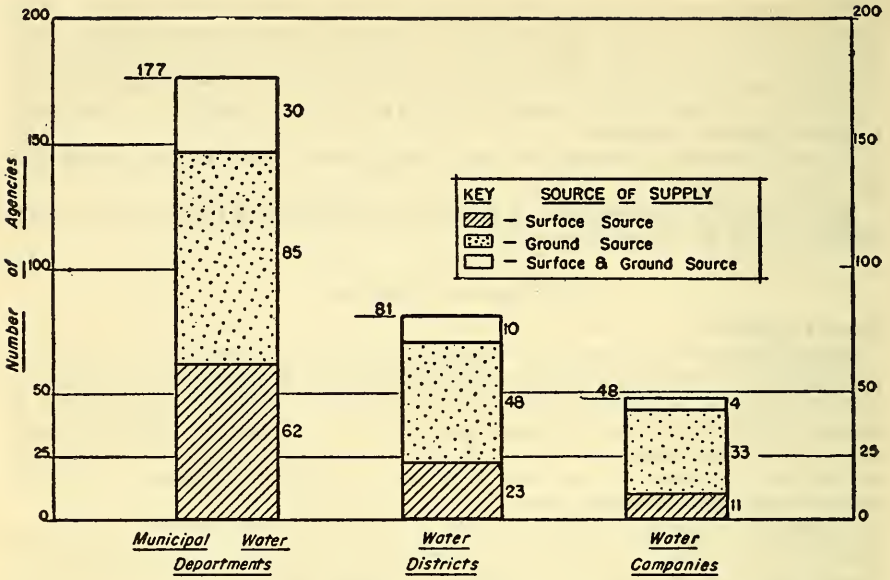

FIGURE 1
Water Supply Agencies by Type and Source

The growth of public water supply service in Massachusetts from 1870 to 1955 is shown in Figure 2.

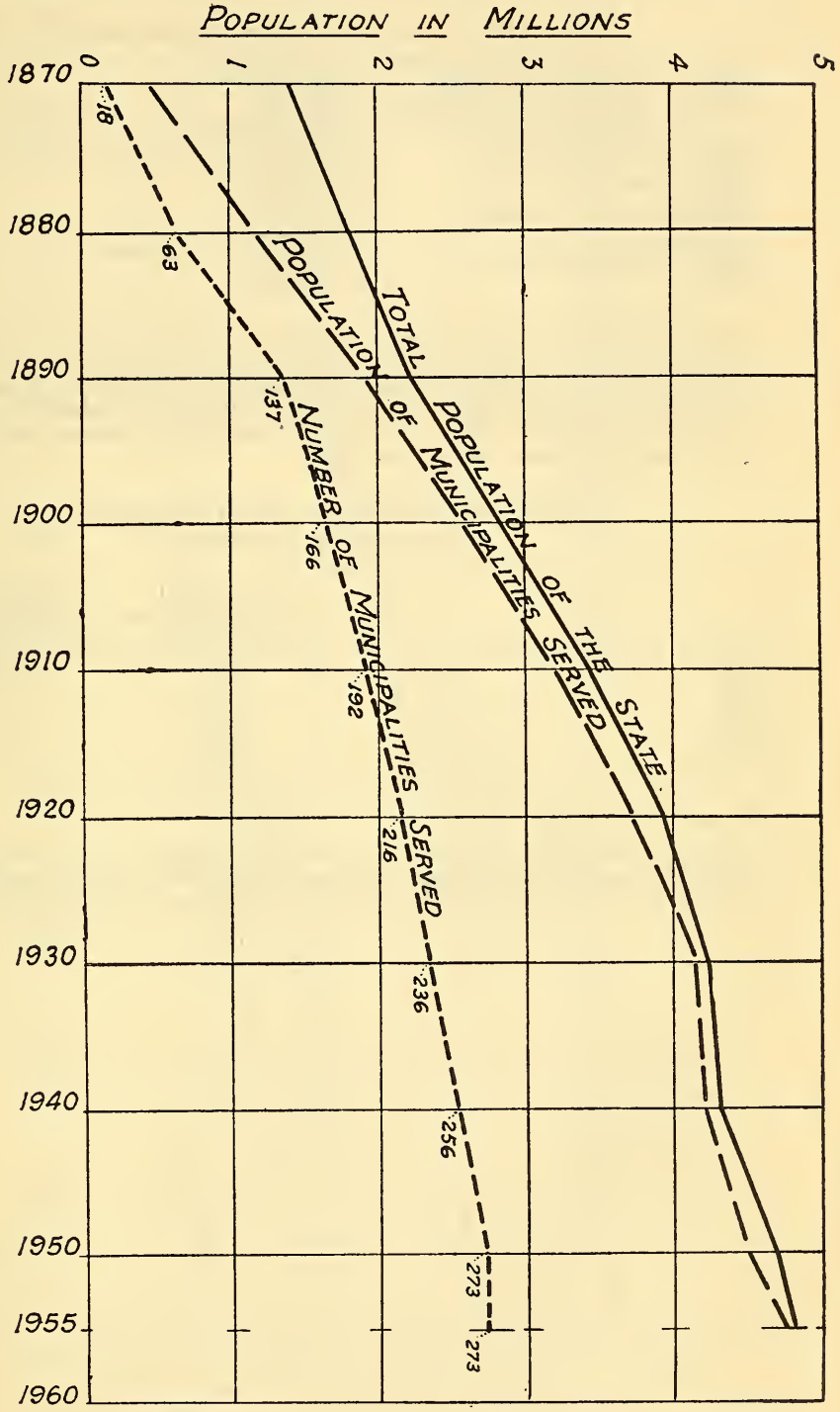

FIGURE 2
Population and Number of Municipalities with Public Water Supplies
1870–1955

The following tabulation shows the public water supply systems which were established during the years 1950 through 1956:

RECENT ESTABLISHMENT OF PUBLIC WATER SUPPLIES

Boylston — Morningdale Water District	Gravel-packed well	1950
Burlington — Burlington Water District	Tubular wells	1950
Raynham — North Raynham Water District	Tubular wells	1950
Raynham Center Water District	City of Taunton Supply	1950
Sutton — Manchaug Water District	Stevens Pond (tests for ground water supply)	1950
Swansea — Swansea Water District	Gravel-packed wells	1950
Templeton	Gravel-packed well	1950
Dighton — Dighton Water District	Tubular wells	1951
Blackstone	Gravel-packed wells	1952
Boylston — Boylston Water District	Gravel-packed wells	1952
Tewksbury	Gravel-packed wells	1952
North Reading	Gravel-packed and tubular wells	1954–1955
Leicester — Hillcrest Water District	Drilled well	1955
Norwell	Gravel-packed well	1956

The availability of sources of water supply of the Metropolitan District Commission has resulted in the towns of Brookline and Marblehead, the city of Newton, the Lynnfield Water District, and the South Hadley Fire District No. 1 abandoning their local sources and obtaining water from the Metropolitan District Commission. The following tabulation shows the number of additions to existing water supply sources during the years 1950 through 1956.

CLASSIFICATION OF SOURCE OF SUPPLY FOR ADDITIONS TO EXISTING WATER SYSTEMS

Year	No. of Additional Ground Water Sources Developed	No. of Additional Surface Water Sources Developed (Artificial Reservoirs)
1950	16	–
1951	14	2
1952	5	–
1953	24	1
1954	19	2
1955	21	1
1956	17	1

Consumption of Water

Figure 3 shows the estimated total water consumption of the Metropolitan District Commission and all the public water supplies in the State, together with the estimated total of the safe yield of all the present sources of water supply.

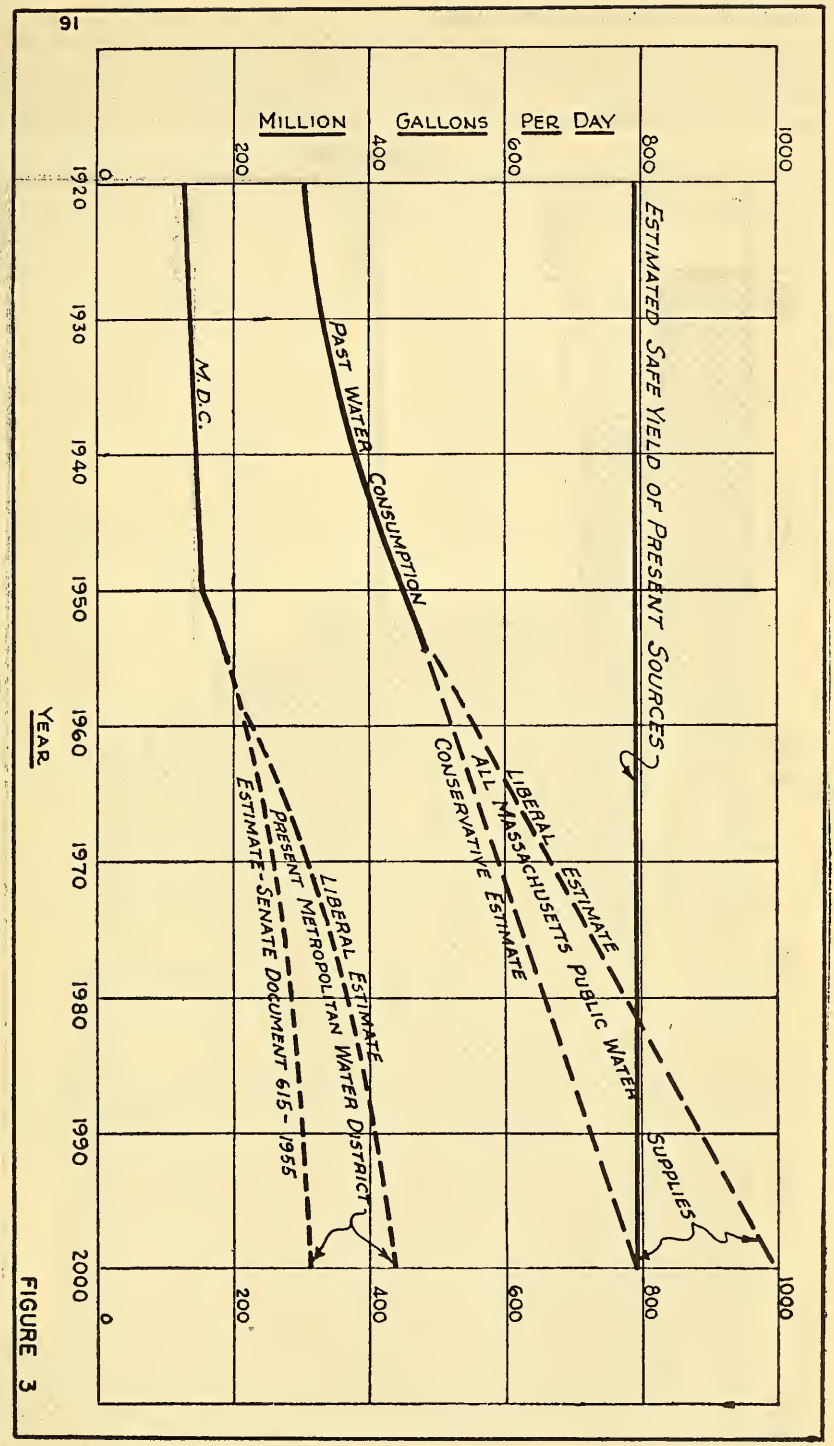

FIGURE 3

Figure 3
Total Water Consumption and Safe Yields (Estimated)

Fluoridation of Public Water Supplies

The water supplies of Massachusetts are deficient in the amount of fluorides necessary to prevent excessive dental caries, and following the recommendations of the Department some 20 communities now treat their water supplies by the addition of a fluoride compound to bring the fluoride content to an optimum value

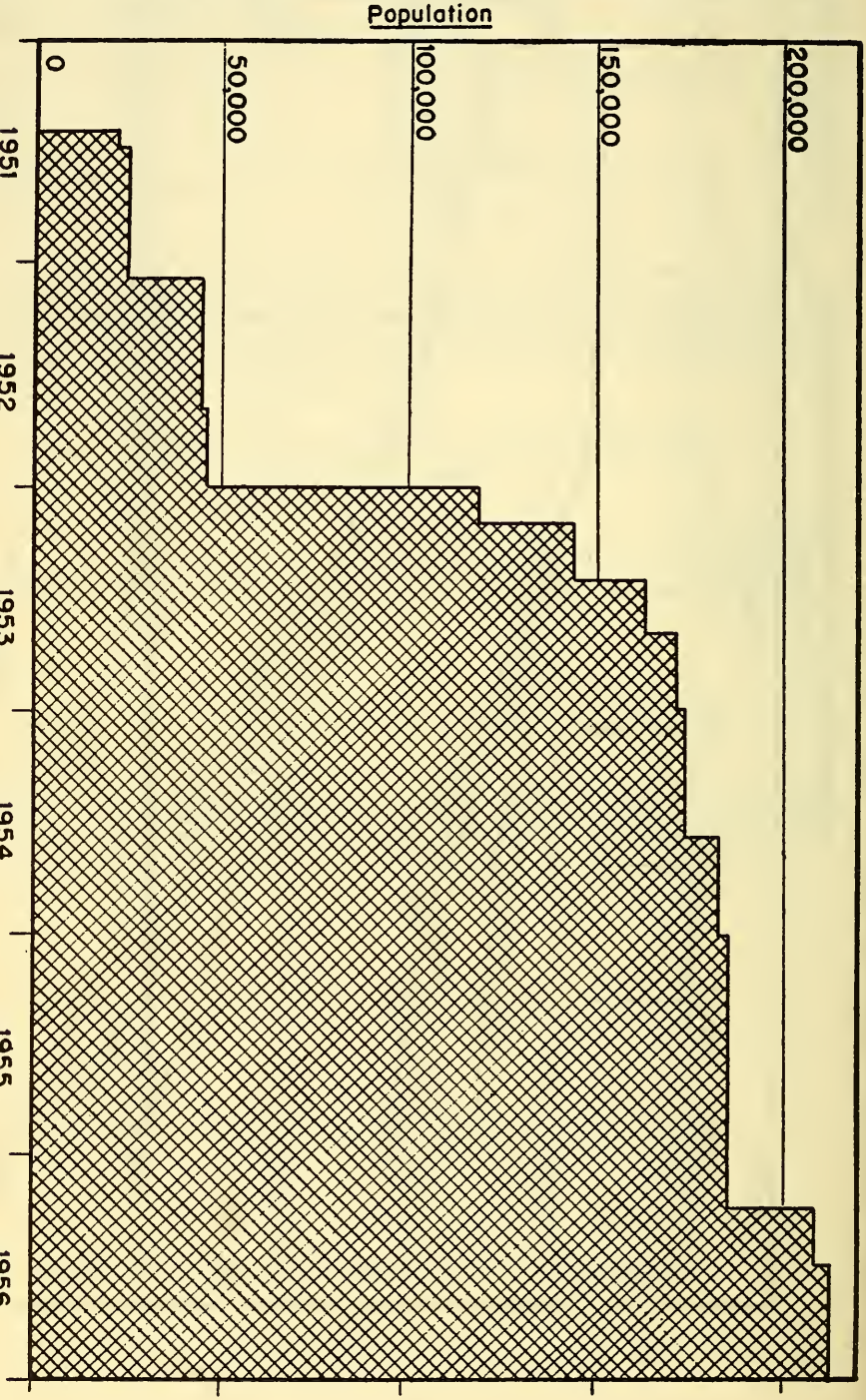

FIGURE 4
Fluoridation of Public Water Supplies

of one part per million. In spite of the fact that the city of Northampton and the towns of Hudson and Williamstown adopted a fluoridation program and later abandoned it by vote, there has been a steady although rather slow increase in the population served with fluoridated water (Figure 4).

Climatological Data: Precipitation

The average annual rainfall in Massachusetts has been well above normal in all but two years of the period 1950–1955 (Figure 5). The total rainfall excess for the six-year period amounted to 27.56 inches, or about half of the normal annual precipitation.

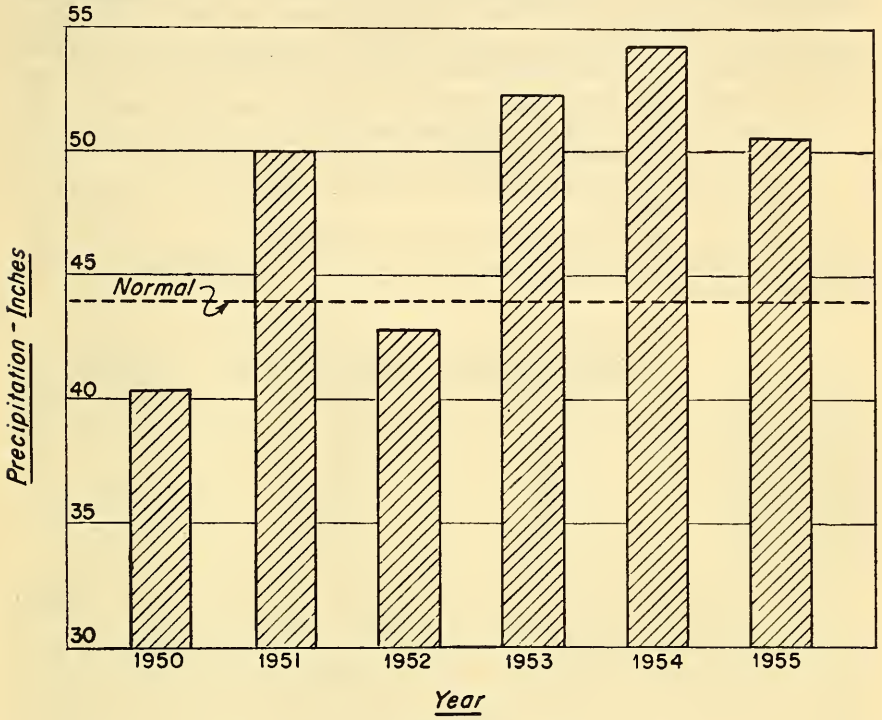

FIGURE 5
Precipitation in Massachusetts, 1950–1955

The following table shows the normal monthly rainfall as deduced from the records of seven long-term stations located at Amherst, Boston, Dalton, Fitchburg, Lowell, New Bedford and Northbridge; also, the monthly rainfall for the years 1950–1955, inclusive:

MONTHLY RAINFALL IN INCHES FOR YEARS 1950–1955

Month	Normal	1950	1951	1952	1953	1954	1955
January	3.59	4.39	3.61	4.66	6.23	2.69	0.88
February	3.33	3.87	4.64	3.64	3.49	2.66	3.71
March	3.84	3.64	4.89	3.64	8.60	3.58	4.24
April	3.63	3.32	3.24	4.21	6.16	4.68	3.92
May	3.64	2.54	4.26	4.22	4.77	7.37	1.63
June	3.50	2.59	3.03	3.93	1.55	3.02	3.42
July	3.76	2.27	3.99	2.01	3.12	2.83	2.26
August	4.15	3.57	3.57	6.20	2.32	5.53	13.57
September	3.56	1.71	2.42	2.96	1.78	8.17	2.58
October	3.49	2.16	4.44	1.21	5.18	2.84	8.41
November	3.89	6.49	7.04	2.20	4.36	5.91	4.80
December	3.58	3.88	4.86	3.94	4.72	4.99	1.07
Totals	43.96	40.43	49.99	42.82	52.28	54.27	50.49

Cross Connections

The cross-connection program of the Department operates under the authority of Section 160, Chapter 111 of the General Laws of the State. The rules and regulations pertaining to cross connections were originally adopted on February 9, 1937. They were amended on May 12, 1942, to facilitate the successful prosecution of the war effort. After the national emergency was over the rules and regulations were readopted in their original form on February 8, 1949. On October 9, 1951, the rules and regulations were revised once more so that they continued in their primary purpose of protecting the public water supply and yet gave the Department more discretionary power to allow properly constructed and properly protected cross connections where it was felt that the public good would be served.

In essence the new rules and regulations forbid the physical cross connection of any other water supply with the distribution system of a public water supply unless:

(a) The secondary water is proved to be of safe and sanitary quality.

(b) The connection includes adequate backflow preventive devices such as check valves, properly installed so that they may be tested.

(c) The entire design and installation meets the approval of the Department of Public Health.

The following table shows the distribution and number of approved double-check valve installations which have been permitted in accordance with these rules and regulations.

Period Ending	Number of Municipalities having Industrial Plants with Double-Check Valve Installations	Number of Industrial Plants having Double-Check Valve Installations	Number of Sets of Active Double-Check Valve Installations in State
December 31, 1949	134	659	1004
December 31, 1950	134	650	1005
December 31, 1951	133	650	999
December 31, 1952	134	654	1002
December 31, 1953	134	634	980
December 31, 1954	132	628	988
December 31, 1955	129	619	989
December 31, 1956	130	616	993

Like all mechanical devices, check valves are subject to failure, and to minimize the dangers inherent in faulty checks the Department requires periodic inspections. The Department has endeavored to educate the local water companies to allow at least one man to become familiar with the testing and overhauling of the check valve installations within their district and to have this designated individual make routine inspections every three months. This individual would make out regular inspection forms and send the Department a copy so that it would be informed at all times. If any check valves were found to be faulty or in need of repair the matter could be attended to immediately.

Once each year an engineer from the Department visits each plant and supervises the testing and overhauling of the check valve installations. Iron-bodied check valves (a type no longer permitted under the Department's rules) are opened at the annual inspection every year, whether they hold or not, and are thoroughly reconditioned. Bronze-bodied check valves are tested for tightness and if they work properly are not usually opened for inspection. Once every five years, however, the bronze-bodied checks are opened for a complete overhauling, cleaning and lubrication.

Within the last few years the Department has embarked upon a program of replacing the hard-rubber discs, usually supplied as standard equipment with the check valves, with a disc made of a softer, more pliable rubber. These softer discs seem to work much better and they substantially reduce the number of small installations which fail to meet the initial test for tightness. In addition, the Department has published informative and descriptive literature for distribution to water supply officials, plant mechanics in charge of double-check valves, and other interested persons.

Illegal and/or improperly protected cross connections constitute a public health menace whose potential danger cannot be minimized. It is encouraging to note that since the inception of the law relating to cross connections in 1937 there have been no known cases of sickness or disease traceable to a cross connection approved and regularly inspected by a Department engineer.

Community Sanitation

Camp Sanitation

During this seven-year period this Division has continued to make examinations of recreational camps, overnight camps or motels and trailer coach parks under authority of Sections 32 B-L of Chapter 140 of the General Laws as amended.

This law requires the board of health to license annually those camps and parks which come under the provisions of the law. The law further specifies that the Department shall be notified of the granting of such licenses and shall have jurisdiction to examine water supplies and methods of sewage disposal.

Since 1939, the camp law has been amended as follows:

Chapter 396 of 1941
Chapter 153 of 1945
Chapters 326 and 802 of 1950
Chapter 74 of 1951
Chapter 583 of 1952
Chapter 130 of 1953
Chapters 134 and 410 of 1954
Chapters 162 and 444 of 1956

As recently as 1940 it was found that only 30 per cent of the recreational camps had satisfactory sources of water supply or methods of sewage disposal or both. In 1952 it was found that the percentage of recreational camps meeting satisfactory standards for water supply and sewage disposal had increased to 70 per cent.

The total number of camps licensed under the provisions of this law has increased steadily since 1949. In 1953, 1,056 camps were examined by the sanitarians and sanitary engineers of this Division.

In recent years because of the increasing number of camps and a smaller staff of sanitarians, it has been necessary to limit the examinations to three classes as follows:

(1) All recreational camps including day camps (350–400 annually)
(2) All new motels, overnight camps and trailer parks or those that have not been previously examined (75–100 annually)
(3) All camps not approved for water supply and sewage disposal following the last examination (35–50 annually)

Bathing places at recreational camps are examined only upon request.

A pamphlet entitled "Camp Sanitation" has been prepared by the Division for the use of local sanitarians and camp operators.

Housing

With more communities recognizing the problems of blight and physical decay of substandard areas, it was felt that enabling legislation should be provided so that minimum housing standards could be drafted for municipalities to adopt and to enforce.

Chapter 631 of the Acts of 1947 directed the Department of Public Health to draft regulations establishing minimum standards of fitness of dwellings and also for the Board of Standards in the Department of Public Safety to draw up minimum standards for construction, alteration, repair and use of buildings, with the assistance of the Commissioner of Public Health.

Regulations establishing minimum standards of fitness for human habitation under Section 128 of Chapter 111 were adopted by the Department in 1949. Several communities adopted the minimum standards, but they proved to be difficult to enforce because of the ambiguous wording. During the latter part of this seven-

year period, two new laws, Chapters 209 and 447 of 1954, were passed which repealed Section 128 of Chapter 111 and substituted Sections 128B, 128C, 128D, 128E and 128F. New problems covered by this legislation were home accident prevention and mobile dwelling places.

The new law invalidated the earlier minimum standards. Accordingly, new standards were adopted by the Public Health Council on March 8, 1955, and filed with the Secretary of State on March 22, 1955. Local standards adopted by action of the city council or town meeting under Section 128 also were invalidated, requiring therefore the adoption of new standards. Minimum standards that were adopted under Section 31 of Chapter 111 remain in force.

For the assistance of local boards of health two pamphlets have been prepared by the Division: "Housing Rehabilitation" and "Minimum Standards." The latter pamphlet explains the mechanism by which municipalities may adopt minimum standards relative to housing.

Refuse and Garbage

The Department has continued to advise communities relative to the correction of objectionable conditions caused by odors, insects, rodents, smoke and fires at dumps.

The Division also examines proposed refuse disposal sites upon the request of the local boards of health. In 1952 a hearing was held by the Department under Chapter 111, Section 152 of the General Laws following receipt of a petition from residents complaining of insanitary conditions resulting from the operation of an open-face dump. Events following this hearing emphasized the lack of authority on the part of the Department to correct unsatisfactory conditions resulting from the operation of a municipal dump.

The Legislature gave additional authority to the Department under Chapter 310 of the Acts of 1955 to control garbage and refuse disposal in communities. According to this law, no dump or incinerator shall be established or operated "unless such place has been assigned by the board of health of the city or town." The Department shall advise upon the request of any board of health as to the assignment of a place and upon appeal may, "after due notice and public hearing" rescind or suspend such an assignment.

Under the Acts of 1952, Chapter 559, provisions were made for the construction and operation by the Metropolitan District of refuse disposal incinerators. Five such incinerators were to be constructed to serve the Metropolitan area. No action has been taken by any of the Metropolitan cities under this act.

The towns of Brookline, Framingham and the city of Worcester have constructed incinerators which are currently being operated. The city of Boston has plans and proposals for an incinerator in the South Boston area.

During this period, vesicular exanthema, a disease found in hogs, became widespread in Massachusetts for the first time. While generally non-fatal to hogs and while not a disease of man, it is serious since it cannot be differentiated from hoof-and-mouth disease without exhaustive laboratory analyses.

To control the spread of this livestock disease, the Legislature enacted Chapter 655 of the Acts of 1953, a law requiring hog producers who are feeding garbage to hogs to secure a permit from the Director of the Division of Livestock Disease Control. This law required that after January 1, 1954, all garbage fed to hogs shall be cooked for at least 30 minutes at a temperature of 212°F. From the public health viewpoint, this law is significant in that trichinosis, a disease of man, is under some form of control.

A pamphlet entitled "Refuse Disposal Methods" has been prepared for the guidance of local boards of health and other interested agencies.

Lockups

In accordance with the provisions of Section 22 of Chapter 111 of the General Laws, the Department continues to make examinations and to approve plans for jails and lockups.

During this period the Department has approved plans for eight new lockups and renovations for one existing lockup. Upon request the Department has consulted and advised communities relative to conditions in existing lockups. District sanitarians make annual examinations of lockups and jails as delegated by the District Health Officer.

Nuisances

The Department has investigated numerous nuisances under the classification of miscellaneous nuisances or under the so-called "noisome-trade laws." In all cases where the request and complaint pertains to local nuisances, the Department has referred the matter to the community for appropriate action under the law.

These complaints vary from the prevalence of leeches in ponds to insect bites suffered by workers in commercial firms. Some others vary from drainage conditions to disposal of night soil by private contractors.

Cemeteries

The Department has continued to advise communities on the location and establishment of cemeteries and the extension of existing cemeteries. For this period advice was rendered in the establishment of six new cemeteries and for extension of one old cemetery.

Local and State In-Service Training

The Division has been successful during this period in organizing meetings with local and State health officials to discuss mutual sanitation problems affecting both agencies. One such activity was the establishment of one-day State municipal environmental conferences held in different localities throughout the State.

Sanitarians and sanitary engineers from this Division made up part of the staff for these conferences. Some of the subjects covered were: new public health legislation, water supply, sewage disposal, housing rehabilitation, swimming pool sanitation, restaurant sanitation, poultry sanitation and camp sanitation.

The main objectives for these meetings are defined as follows:

(1) To clarify responsibilities of State and local agencies in matters of environmental sanitation;

(2) To discuss new programs and modern accepted practices in the control of environmental hazards.

The Division has continued to cooperate with the New England Field Training Center at the University of Massachusetts by providing speakers for the 12-week course for sanitarians and for one-week courses on specialized subjects. An eight-week course is also presented for graduate sanitarians receiving supervised field training.

During the early period of this report over 89 communities were given ratings of their eating establishments by the Department as a result of surveys conducted by the district sanitarians. In an endeavor to raise these standards the district sanitarians have assisted the local boards of health in organizing schools for food handlers in the technique of proper food sanitation. These training courses are also presented for the food handlers from institutions.

Insect and Rodent Control

Many requests for information and advice on problems of control of insect and rodent infestations are handled by the Division. In 1953 the Division cooperated with the Public Health Service in presenting a five-day training course in rat control for representatives of local health departments in Massachusetts.

A member of the Division was assigned for several months in 1950 to a field investigation of methods of control of the eastern dog tick (*Dermacentor variabilis*).

Home Accident Prevention

In recent years, as illness and death resulting from communicable disease have been markedly reduced, health departments have taken a new look at the problem of accident prevention.

On August 1, 1953, the Home Accident Prevention Project was established as an integral part of the Division of Sanitary Engineering, financed through a grant of $96,660 from the W. K. Kellogg Foundation. For the first two years the entire cost of the program was borne by the Foundation, but part of the cost is now being financed by the Division. Massachusetts was one of eight states to receive funds for demonstration projects in this field.

The project has undertaken a three-year study of home accidents reported by a selected group of hospitals and physicians throughout the Commonwealth. Preliminary reports of the results of this study have been prepared and it is planned to publish the results of the analysis of about 15,000 injury reports. This report should provide valuable information regarding the types of injury and the environmental hazards associated with these injuries as well as other data that may be useful in planning future home accident prevention activities.

In-service education programs for nurses and sanitarians have been conducted in several areas of the State. The project staff have worked with local boards of health, service clubs, and other agencies interested in developing home accident prevention activities. Lectures and demonstrations have been given to many interested groups, and exhibits have been shown at several meetings of public health groups and at local health department meetings.

A number of pamphlets and leaflets were prepared by the staff and have had wide distribution. News release material has been developed and mailed to selected boards of health, radio stations, and newspapers for local release.

Atmospheric Pollution Control and Radiological Health Section

This division in past years has been called upon to assist communities in atmospheric pollution problems and, in more recent years, in problems involving possible exposure to ionizing radiation. Increased industrialization and population growth, together with the more and more frequent incidents of inversion phenomena throughout the United States, have made both the public and public health officials increasingly conscious of the need for methods to control air pollutants to insure a continued safe and comfortable environment.

As a result, the demands on this division for the solution of problems involving atmospheric pollution have kept pace with this ever-increasing awareness. During the period covered by this report, legislation was passed whereby the Department of Public Health, under the provisions of Chapter 672 of the Acts of 1954, was vested with the control of all types of air pollutants being discharged to the atmosphere within the Commonwealth. This enabling act now allows for the adoption of rules and regulations designed to specifically control air pollutants, whereas heretofore control was possible only through the broad interpretation of existing nuisance and noisome-trade laws.

In a similar way the demands upon the Department for both information and control of pollution of our land, water, and air by ionizing radiation have increased through public awareness and through the release of government-controlled radioisotopes for peacetime use. Again, during the period covered by this report, enabling legislation has been passed authorizing the Department of Public Health, under the provisions of Chapter 335 of the Acts of 1955, to regulate methods of production, handling, and disposal of radioactive materials which may affect the public health.

As a result of these legislative acts an Atmospheric Pollution Control-Radiological Health Section has been established within the Division of Sanitary Engineering. This section is headed by a sanitary engineer and includes two additional sanitary engineers and a biologist, who have been trained and will receive further training to allow them to effectively and reasonably develop and administer programs to insure the continued highest use of our environment.

To supplement the field work being done two laboratories staffed with trained technicians have been established at the Lawrence Experiment Station, one for radiological health and one for atmospheric pollution control. In addition to routine analyses a major portion of the work is being devoted to fundamental research in the development and standardizations of methods of analysis.

The current activities and duties of this section are as follows:

(1) Oversight of the activities of the Division of Smoke Inspection, which was transferred, under the provisions of Chapter 672 of the Acts of 1954, from the Department of Public Utilities to the Department of Public Health.

The Division of Smoke Inspection is authorized by Chapter 651 of the Acts of 1910 to regulate visible smoke emissions from stationary locomotive and marine stacks within the 31 cities and towns which comprise the Greater Metropolitan Smoke District.

(2) To prescribe and establish minimum rules and regulations to prevent pollution or contamination of the atmosphere within the Commonwealth (Chapter 111, Section 142A).

(3) To advise local boards of health and render technical assistance in all matters of atmospheric pollution (Chapter 111, Section 31C).

(4) To assist in drafting, and reviewing for approval, minimum rules and regulations that may be adopted by local boards of health for the control of atmospheric pollution (Chapter 111, Section 31C).

The Division has drafted a suggested set of rules and regulations for the control of visible smoke, dust, soot and fly ash in the city of Holyoke.

(5) To assume joint jurisdiction to regulate and control such causes of atmospheric pollution adversely affecting one town but arising in another, and may exercise all powers of the local boards of health or other legal authority (Chapter 111, Section 31C).

In conformance with the provisions of this section of the law, an investigation and survey of the Salem-Marblehead area in the vicinity of Naugus Head is being made at the request of the Marblehead and Salem boards of health. Four air-sampling stations have been established and are currently being operated to determine the extent of alleged heavy outfalls in this area.

(6) To conduct special atmospheric pollution surveys in municipalities upon request of the municipality and upon receipt, in advance, of the estimated cost thereof. (Current provisions of Supplementary Budget.)

Such a survey was begun in the town of Milford and will entail source sampling, air sampling and in-plant surveys and investigations. Upon completion of this program suggested rules and regulations for the control of atmospheric pollution in Milford will be submitted to the municipality for consideration and adoption.

(7) Independently, or in cooperation with federal and other State agencies, to conduct special or general atmospheric pollution studies and surveys throughout the State.

In January 1955, at the request of the Pittsfield Public Safety Committee, a special preliminary air pollution survey of the Pittsfield area was made. As a result of this survey it was judged necessary to establish air sampling stations in and about areas adjacent to the industrial complex of Pittsfield to determine levels of heavy particulate outfall, suspended particulate matter and mineral content of the atmosphere in the Pittsfield area.

To evaluate the possible increase in levels of particulate pollution that may result from discharges from the proposed 600-ton-per-day Boston municipal incinerator, the Division is presently selecting sampling sites in areas adjacent to the proposed site. Sampling will begin in the very near future to determine the existing levels before work on the incinerator begins.

Other special sampling surveys now in progress, and to be continued over an extended period of time, to determine background levels of air-borne pollution are as follows:

In October, 1954, in conjunction with the Robert A. Taft Sanitary Engineering Center of the Public Health Service, an air sampling program of the Metropolitan Boston area was initiated. Under this program 24-hour high-volume air samples are taken simultaneously each week from sites in Boston, Everett and Newton. Suspended particulate matter is collected on a glass fiber filter which captures particles down to 0.3 microns in size. The filters are then forwarded to the Sanitary Engineering Center for analyses of the total particulate content, extractible organics, mineral and radioactive analyses.

In October, 1954, a soot and dust fall study was begun in eastern Massachusetts to determine levels of pollution due to the outfall of large particulate matter. Stations were selected for convenience and in areas that will give levels of industrial, commercial and residential air pollution due to heavy particle outfall. These stations, selected to give background data only, are seven in number and are located in the Metropolitan Boston and Lawrence-Andover areas.

In the field of radiological health, the section presently is concerned with:

(1) Prescribing and establishing rules and regulations to control the transportation, storage, packaging, sale, distribution, production and disposal of radioactive materials which may affect the public health or the health of persons exposed to radioactivity or ionizing radiation (Chapter 111, Section 5B).

(2) Maintaining liaison and cooperating with other State departments and other divisions of this Department in matters relating to radiological health.

(3) Maintaining liaison with governmental and non-governmental agencies (such as the Public Health Service and the Atomic Energy Commission) and interstate commissions and groups (such as the New England Interstate Water Pollution Control Commission and the Regional Coordinating Committee on Radiological Health) in matters relating to radiological health.

(4) Conducting special surveys, independently or in cooperation with other State of federal agencies, relative to environmental radiological health matters pertaining to water, air, or persons exposed to radioactivity or ionizing radiation.

The Department is currently making arrangements to participate with the Federal Government and other State agencies in the operation of a National Radiation Surveillance Network. This network is being established to determine levels of radioactive fallout resulting from atomic bomb detonations.

(5) Cooperating with medical, radiological, health physics, educational and engineering professions, industries, and institutions in special problems and in studies relating to sources of ionizing radiation and its relation to the health of the public and to pollution of the atmosphere, water, soil, and the general environment from and by radioactivity and radioactive substances.

(6) Cooperating with and assisting the Civil Defense Agency in certain problems of staffing, training, services, equipment, and facilities in time of certain disasters or programs pertaining to radiological health.

Division of Smoke Inspection

During the period of this report the Division of Smoke Inspection was transferred from the Department of Public Utilities to the Division of Sanitary Engineering of the Department of Public Health under the provisions of Chapter 672 of the Acts of 1954, effective September 8, 1954. This division is financed by a special assessment on the municipalities within the district, which is known as the Metropolitan Boston Smoke District (Figure 6) and includes a director, supervising smoke abatement inspector, six assistant smoke abatement inspectors and one principal clerk.

FIGURE 6
Metropolitan Smoke District

The Division is authorized by Chapter 651 of the Acts of 1910, as amended, to regulate visible smoke emissions from all stationary, locomotive, and marine stacks within the thirty-one cities and towns that comprise the Metropolitan Boston Smoke District. The district includes the municipalities of Arlington, Belmont, Boston, Braintree, Brookline, Cambridge, Canton, Chelsea, Dedham, Everett, Lynn, Malden, Medford, Melrose, Millis, Milton, Needham, Newton, Peabody, Quincy, Revere, Saugus, Somerville, Stoneham, Wakefield, Waltham, Watertown, Weymouth, Winchester, Winthrop and Woburn, with an approximate population of 2,000,000 covering an area of 320 square miles.

The allowable duration and density of visible smoke emissions as determined by the Ringelmann Chart vary according to the types and diameters of the stacks. In addition, the law provides that the Division may conduct investigations, hold hearings and issue orders for abatement.

From the effective date of transfer to this Department through June 30, 1956 the activities of the Division were as follows:

Plant inspections made as result of complaints and violations	1436
Office conferences held with industrial representatives relative to complaints and violations	90
Formal hearings conducted under the provisions of Chapter 651 of the Acts of 1910, as amended	35
Orders to abate issued under the provisions of Chapter 651 of the Acts of 1910, as amended	14
Excessive emissions and violations of orders to abate	780
Complaints received relative to stack emissions	523
Total of stack observations	254,833

Water Pollution Control

Examination of Rivers

The Department has been designated a Water Pollution Control Agency of the Commonwealth and maintains general oversight over all of its surface waters. In this connection the Division of Sanitary Engineering has a Water Pollution Control Section which handles matters pertaining to the quality of surface waters, sewage disposal, industrial waste disposal, shellfish sanitation, and bathing in natural waters. Massachusetts cities and towns were originally established on the seacoast or our principal rivers. Industries were located on streams to take advantage of the abundant supply of soft, clear water, direct water power and also to dispose of liquid wastes. As our public water supplies have generally been taken from upland waters where it has been possible to protect the source, there was originally very little public health significance to our methods of disposal of surface and industrial wastes directly to the streams. As the population and the number of industries has increased, the condition of our streams has deteriorated so that in many instances nuisance conditions have prevailed. In certain instances, notably Lawrence and more recently Billerica, it has been necessary to turn to polluted water courses as sources of domestic water supply. In these instances, adequate water filtration plants have been constructed to provide a safe, potable water.

The Department maintains approximately 260 river sampling stations throughout the Commonwealth. Samples of water are collected periodically for chemical analysis and bacterial examination. At the same time, samples are taken from the effluents of sewage treatment plants discharging into these waters in order to have a more complete record of the cause and effect of these wastes on stream quality. In general it may be said that the small streams of the Commonwealth are not polluted but the main threads of the streams receive sewage and industrial waste either directly or after treatment. Certain of the streams, notably the Nashua River below Fitchburg, the Housatonic River below Dalton, the Hoosic River in North Adams, and the Merrimac River below Haverhill, are occasionally in a nuisance condition. As a result of the construction of industrial waste treatment plants in Mansfield and Foxboro, the Rumford River, formerly very seriously polluted in the town of Mansfield, is now in a suitable sanitary condition. Construction of waste treatment plants serving the paper mills in the city of Fitchburg has improved the quality of the water of the Nashua River to some extent. However, that stream continues to be in an unsatisfactory condition due largely to the discharge of de-inking wastes in the Fitchburg and Leominster areas.

The New England Interstate Water Pollution Control Commission held its first meeting on November 25, 1947. Massachusetts, Rhode Island and Connecticut were signatory to the compact at that time. New York entered the compact on August 19, 1947, Vermont on June 29, 1951, New Hampshire on July 13, 1951 and Maine, the last eligible state, on August 31, 1955. Thus all of the New England states and New York entered into a compact to classify the interstate waters and to work for the alleviation of pollution of these streams. The compact has adopted water quality standards for interstate waters. In general, it may be said that Class A waters are suitable as a source of drinking water without further treatment and for the cultivation of market shellfish. Class B waters are suitable for bathing. Class C waters are suitable for recreational purposes, boating, fishing, industrial water supplies and for the propagation of fish indigenous to the areas. Class D

waters are suitable primarily for the transportation of waste without nuisance and for power and industrial loading. Class E waters are those in which nuisance conditions prevail either regularly or occasionally.

Meetings of the Commission have been held regularly. Subcommittees of the technical advisory board have conducted studies of the quality of waters of various interstate streams leading to the classification of the following streams:

Connecticut River	Taunton River
French River	Ten Mile River
Quinnebaug River	Salmon Brook

Studies are under way relative to the classification of the following streams:

Housatonic River	Beaver Brook
Deerfield River	Spicket River
Hoosic River	

Cooperation with the Public Health Service

The first federal water pollution control act was Public Law 845 of the 80th Congress, second session. Under the provisions of the Act certain funds were made available to state and interstate agencies for investigation relative to industrial waste disposal, during fiscal years 1949 and 1950. Subsequently, no federal funds were made available for that purpose. As of June 30, 1956, Congress enacted Public Law 660, continuing and strengthening the Federal Water Pollution Control Act. Under the provisions of this law, Congress is authorized to provide grants-in-aid to communities for the construction of sewage treatment facilities and to state and interstate agencies for water pollution control studies. Although the budget was not passed until later in the season, funds for these purposes were made available. Thus, for the first time, cities and towns became eligible to receive grants for the construction of sewage treatment facilities.

The Department cooperated with the United States Public Health Service and other federal agencies in preparing a report of the water resources of the New York and New England area. The report of the joint committee is available and on file in the office of the Division of Sanitary Engineering. The report contains information relative to sources of pollution, the sanitary condition of our streams, and the needs of all communities and industries relative to sewage and industrial waste disposal.

Prevention of Stream Pollution

Chapter 615 of the Acts of 1945 amended Section 5 of Chapter 111 of the General Laws, authorizing the Department to promulgate rules and regulations for the sanitary protection of our rivers, lakes, ponds and other watercourses. Such rules and regulations were adopted by the Department on August 14, 1945, and approved by the Governor and Council on September 19, 1945. In general, these rules and regulations provide that no sewage, human excrement, house slops or sink wastes, garbage, manure or putrescible matter, manufacturing refuse, waste product or any polluting liquid poisonous or injurious to humans or animals shall be discharged into any waterway within the Commonwealth except as it may be approved by the Department of Public Health when in its opinion the best practicable and reasonably available means to render the same harmless have been provided in accordance with plans approved by the Department.

These rules and regulations become effective upon publication in any community. The Department has found it necessary to publish or post such rules and regulations in 72 communities.

After some experience, it was found that Section 5 of Chapter 111 as amended did not prove effective in preventing pollution of our waters from municipal sources. In order to correct this situation, the Legislature enacted Chapter 552 of the Acts of 1951, which amended Chapter 111 by adding Sections 1A and 1B. Under the provisions of this act, the stream pollution control law became effective in cases of sources of pollution from municipal or state institutions. However, in cases of municipalities, the Director of the Division of Accounts of the Department of

Corporations and Taxation must hold a hearing in the political subdivision affected, and no political subdivision may be required to expend an amount in excess of that determined by the Division of Accounts to be within its ability to finance for the construction of sewage abatement facilities.

Municipal Sewage Treatment Plants

The Division of Sanitary Engineering inspects municipal sewage treatment plants from time to time and collects samples of raw sewage and plant effluent for analysis. Of the 351 cities and towns of the Commonwealth, 136 municipalities are now served by public sewerage systems. The population of such communities as based on the 1955 census is 4,139,350. Sewage from 67 municipalities, representing a total population of 1,716,433 persons, is discharged to sewage treatment works; 215 municipalities have no recognized public sewerage systems. These represent a total population of 698,295 persons. New sewerage systems and sewage treatment plants constructed subsequent to July 1, 1949 are as follows:

NEW SEWAGE TREATMENT WORKS

City or Town	Year		Sewage or Effluent Discharged into
Andover(Ballardvale)	1955	Imhoff Tank and Trickling Filter	Shawsheen River
Attleboro	1950	Screens, Grit Chamber, Sedimentation Tanks and Sludge Beds	Ten Mile River
Bridgewater	1950	Bar Racks, Imhoff Tanks, Trickling Filters, Secondary Sedimentation, Sludge Bed	Town River
Dudley	1951	Grit chamber, Comminutor, Sedimentation Tanks, Chlorination, Sludge Digestion, Sludge Beds	French River
Fall River	1952	Screens, Grit Chamber, Sedimentation Tanks, Chlorination, Sludge Digestion, Elutriation Vacuum Filtration and Incineration	Mount Bay Hope
Middleborough	1951	Comminutor, Sedimentation, High Rate Trickling Filters, Secondary Sedimentation, Sludge Digestion and Sludge Drying Beds	Nemasket River
Taunton	1951	Grit Chamber, Comminutor, Grease Tanks, Primary Settling Tanks, Chlorination, Sludge Digestion and Sludge Beds	Taunton River
Webster	1952	Bar Racks, Primary Sedimentation, Sludge Digestion, Sludge Beds and Chlorination	French River
South Metropolitan District	1952	Coarse Screening, Grit Removal, Comminution and Fine Screening, Aeration, Sedimentation, Chlorination, Sludge Digestion	Boston Harbor

Improvements or Additions to Sewage Treatment Works

City or Town	Year		Sewage or Effluent Discharged Into
Ayer	1952	New Settling Tanks and Sludge Beds	
Concord	1955	New Imhoff Tank	
Gardner	1952	Reconstructing Sludge Beds	
Marion		Rehabilitation of Plant and New Chlorination	
Saugus	1952	New Comminutor at Pumping Station	
Spencer	1950	Additional Settling Tanks and Sludge Beds, Renovation of Sand Filters	Seven Mile River

Shellfish

The Division of Sanitary Engineering, in determining the suitability of shellfish areas for the taking of shellfish, examines roughly 2000 miles of Massachusetts coast line, which encompasses some 50 cities and towns. In 1950, Massachusetts occupied second place among the nation's leading soft shell clam producers. It has been estimated that some 20,000 acres of flats in the State at one time were producing shellfish. In Boston Harbor alone some 2,000 acres have been reduced to about 15 per cent of their former productivity. Various studies have failed to reveal the actual causes for the depletion of shellfish in areas formerly highly productive, but suspicion has been cast on the deleterious effects of sewage pollution on the flats and the decimating effect of natural predators on the shellfish population as possible contributing factors. At the present time the number of closed shellfish

areas, located in some 30 communities and ranging from entire harbor areas to small portions of coast line and estuaries, totals approximately 35. The number of areas from which shellfish may be taken for purification purposes only, designated as moderately polluted areas, totals approximately 40.

Under Massachusetts law the Division regulates the following aspects of the Massachusetts shellfish program:

(1) The classification and the approval of harvesting areas from which shellfish may be taken for food purposes.

(2) Approval of the construction, operation and maintenance of shellfish purification plants.

(3) Approval of out-of-state shellfish certificates.

In approving shellfish harvesting areas, the Division performs various and numerous examinations dealing with the sanitary quality of the shellfish and overlying waters. Sanitary surveys are conducted of the watersheds tributary to the shellfish growing areas to establish to what extent the growing areas are subject to pollution. Representative samples of the shellfish and overlying sea water under varying conditions of tide and wind are collected and analyzed for bacterial content at the Lawrence Experiment Station.

The number of bacterial examinations of shellfish samples made at the Lawrence Experiment Station is as follows:

Fiscal Year	*Shellfish Samples Examined*
1949–1950	913
1950–1951	1,183
1951–1952	1,285
1952–1953	1,227
1953–1954	3,335
1954–1955	1,217
1955–1956	1,654

The construction, operation and maintenance of shellfish purification plants are subject to the approval of the Department of Public Health under Chapter 130 of the General Laws, as amended by Chapter 598 of the Acts of 1941, and the rules and regulations adopted by the Department of Public Health on May 10, 1949. Research has been conducted relative to the purification of shellfish, which has led to the establishment of the method presently employed at the Newburyport Shellfish Treatment Plant. Weekly inspections of the plant are made in order to appraise operating conditions.

The numbers of barrels of clams treated at the Newburyport Plant during the years 1949–1956 are as follows:

Fiscal Year	*No. of Barrels*
1949–1950	22,704
1950–1951	31,002
1951–1952	28,090
1952–1953	19,300
1953–1954	14,176
1954–1955	22,104
1955–1956	17,002
Yearly Average	22,054

The average number of barrels treated during the years from 1941–1949 was 15,597. Therefore, 1949–1956 showed an increase of 41.4 per cent over the previous years. In order to handle the increased load at the Newburyport Plant, a new addition was constructed in 1952 containing six reinforced concrete tanks. The

tanks are divided by two baffles so that continuous aeration and recirculation of water may be practiced if desired. As yet, no washing mechanism or conveyor belt to facilitate culling of broken clams has been installed, although it was planned to have this upon the completion of the new building. It is hoped to install this equipment in the near future.

New legislation passed in recent years concerning the sanitary control of shellfish areas has assisted the Division considerably in regulating its shellfish sanitation program. Section 74 of Chapter 130 of the General Laws, as amended by Chapter 243 of the Acts of 1954, directs that the Department no longer need examine all contaminated shellfish areas yearly but shall examine them for contamination from time to time as conditions may require, but not necessarily more frequently than once in two years. Prior to the passage of this legislation, the Department was performing the arduous task of conducting examinations annually of all contaminated shellfish areas. These examinations, annual advertising and posting have been a drain on both the finances and personnel of the Department.

Section 74 of Chapter 130 of the General Laws, as amended by Chapter 288 of the Acts of 1956, which authorizes the Department immediately to designate shellfish areas as contaminated in the event of emergencies, assists the Department substantially in guarding the public health against possible infection from waterborne diseases transmitted by contaminated shellfish.

Section 81 of Chapter 130 of the General Laws, as amended by Chapter 711 of the Acts of 1955, provides that no action is necessary on the part of the Department of Public Health in the matter of importing shellfish into Massachusetts from a foreign country or province, provided that such foreign country or province has approved certification from the United States Public Health Service.

Lawrence Experiment Station

The period from 1949 to 1956 was marked by the closing of the Water and Sewage Laboratory, which had been operated on the top floor of the State House since January, 1897, and of the old Experiment Station in Lawrence, which had been the site of the research work as well as much of the analytical work of the Division of Sanitary Engineering since 1886. October, 1952 saw the laying of the cornerstone of the new station, and in March, 1954 all the laboratory and research facilities of the Division, with the exception of the district laboratory in Amherst, were consolidated in the new Lawrence Experiment Station.

The new building with its ample modern facilities and the long-needed working space houses not only the analytical laboratories and the research on water, sewage, and industrial wastes, but also the radiological studies, which first began at the old station in 1951; the plumbing laboratory, which first functioned in 1955; and the laboratory work on air pollution, which also first began in 1955 and reached full-scale operation in 1956.

Although much new laboratory apparatus was purchased for the new station, a considerable amount of equipment was salvaged from the old laboratories, and the moving and arrangement of both old and new facilities was a formidable task. Careful scheduling made it possible to keep complete equipment in operation at one site or another, so that the necessary analytical work of the Division was continued without interruption and the normal schedule of samples from the cities and towns of the Commonwealth was always maintained. The longest interruption in examination of the water samples current in the bacteriological laboratory was spent in the transportation of cultures from the old station to the ample and carefully controlled incubator room in the new building.

The following table summarizes the samples examined by the combined laboratories during the period 1949–1956:

Chemical samples in connection with the investigation of the disposal of domestic sewage, treatment of water, and inspection of rivers and bathing places . . .	56,645

Chemical samples in connection with the investigation of industrial wastes	16,778	
Chemical and mechanical analyses of sand and other filtering materials	2,193	
Total chemical		75,616
Bacterial samples in connection with water supplies, bathing places, stream pollution and other work of the Department	116,970	
Bacterial samples in connection with shellfish	12,170	
Total bacterial		129,140
Microscopic examinations		7,716
Radiological examinations		3,704
Grand total		216,176

In addition there were about 1,000 air samples up to the end of June, 1956. At present the rate of such samples approaches 1,000 per month.

In addition to the regular professional staff of this station, from one to five sanitary engineers have been assigned to work out of Lawrence supplementing the work of the district engineers, and particularly caring for most of the field work on stream pollution, industrial wastes and special problems involving water supply and sewage disposal. In many cases on special assignments members of the regular personnel of the Station are assigned to work in the field with these engineers or with other engineers assigned from the main office or from the district headquarters.

In connection with public water supplies, the Division maintains a constant check on every water supply in the State. In carrying out this work three chemical samples from every water supply are examined each year; and from other cities and towns, particularly those considered as critical areas from a standpoint of civil defense, samples are taken more frequently. In all, this accounts for about 2,500 chemical samples each year. In addition, during the past seven years special problems of one kind or another involving 62 water supplies have resulted in special samples at the Station, and many times these investigations required special experimental work. Such samples totaled nearly 3,000 during the seven-year period. The great majority of these samples were collected by members of the engineering staff, but in very many cases again Lawrence personnel assisted in the collection of samples and particularly in field analysis and other special work. One of the causes of these special samples was the growing interest in the correction of corrosion. As more and more supplies utilize the addition of alkalies, or of special chemicals like sodium hexametaphosphate, the problems for all of these water supplies become more important and involved. In almost every case this station is required to determine by means of the Langelier test the optimum concentration of chemicals which should be added and, after treatment has begun or is being maintained, it is very frequently necessary to examine large numbers of samples from the distribution system in order that the best effects may be obtained from such treatment.

Other special work results from natural causes, including, of course, the hurricanes which were experienced several times during this period. During these natural disasters it is generally necessary to send out personnel from the Station to supplement the field work of the engineers, and especially to assist them in the installation of emergency chlorinators or other equipment, all of which is normally stored at the Experiment Station. On two occasions during this period fire destroyed chlorination equipment, and emergency apparatus at the Station was installed in a very short time. Frequently also water shortages compel cities and towns to use auxiliary supplies or to make temporary connections to other supplies, and in each such case extra samples are analyzed and personnel are sent out to do such work.

In addition to the usual sanitary analyses on water supplies, there is a frequent demand for special determinations, such as those involving the use of water for boiler purposes, the possibilities of corrosion, and the usefulness of the water in

certain industries. In order to keep such information current a program has been set up under which a very complete mineral analysis is made on every water supply about once every two and a half years, with more frequent examination of some of the supplies from which numerous industries make demands.

Almost continuously the Station is requested to give assistance in regard to tastes and odors in water supplies. Sometimes these are associated with corrosion or other problems discussed above, but frequently they are the results of the presence of algae or other organisms. The Station makes regular and frequent microscopical examinations of most of the water supplies in the State, and in addition makes special determinations if taste and odor problems arise, with a view to indicating the proper kind and degree of treatment and the success obtained by such treatment. In addition, about a dozen municipalities have made intensive investigations to improve the tastes and odors in their supplies, and in several cases this has involved hundreds of samples being received and examined at the Station.

One of the most important of the newer parts of the work of the Station has resulted from the growing use of fluorine to reduce dental caries. Every water supply in the State has been examined several times to determine its normal fluoride content, but whenever a supply receives additional fluorides the Department requires that examinations must be made daily by the water department, and in addition analyses are made several times a month by the Experiment Station. In this way a check is maintained on the local determinations. The method now in use is one which was devised by the personnel of the Station, to be as simple as possible while still giving accurate results in the hands of normal water plant personnel. In order to make sure of uniform procedure all of the equipment and all of the chemicals used by the water departments are furnished from the Experiment Station and these are renewed very frequently. In addition, the Station, upon request, examines supplies of fluoride and tests equipment and apparatus used in the fluoride treatment. In addition, to check determinations of the simpler method, every supply is examined by more delicate means quite frequently. Almost since the beginning of the use of fluoride the Station has maintained almost constant research on improvement of methods for very exact laboratory work and for the field. As part of the training program always being carried on at the Station, representatives of practically all of the water departments now using fluoride have received more or less special training at the Experiment Station.

In addition to the chemical samples received from the water supplies, the Station sends out and receives every four weeks from one to ten bacteriological samples on every supply in the State. A few samples from nearby supplies are brought in to the Station, but the great majority are received by mail or express. The average number of samples thus received is almost 7,000 each year. Practically all of the water supplies of the State are free from coliform bacteria, but in case such organisms are found the engineering forces are promptly notified so that remedial measures may be taken and repeat samples be examined. In addition, of course, in cases of emergency many more than the normal number of samples are received.

Particular assistance has been given in regard to cities and towns using various methods of filtration in procuring their water supply. Many of the personnel engaged in coagulation and filtration work have received training at the Station. However, the constant use of new chemicals and unusual weather conditions many times make it necessary to give special assistance, either by analysis or field work, for the best solution of these problems. As an example, over a dozen of these water supplies from time to time have used special filter aids and in each case the assistance of the Station was required. In addition, the Department continues to make analyses of sands and other filtering material for water filtration as well as for sewage work.

A very considerable amount of work results also from the use of weed killers in water supplies or in their tributaries and in areas surrounding watersheds. In almost every case these materials result in taste and odor problems.

In addition to the work on public water supplies, each year several hundred

samples for chemical and bacteriological examination are received from semi-public supplies, such as camps, schools, and bathing and other recreational areas. The law in regard to most of these areas requires an approved water supply, and analyses of samples from such sources are made at the Experiment Station.

As mentioned above, a great part of the work of the Division on pollution of streams was conducted from the Experiment Station, and for the past several years practically every important river basin in this State has been examined monthly or more often. In addition to the usual sanitary chemical and bacterial samples involved, in many cases special determinations have been made, particularly in connection with the discharge of sewage or industrial wastes into the streams. In this connection this Station has assisted the Department in its cooperation with the work of the New England Interstate Water Pollution Control Commission, and representatives of the Station have assisted on the technical committees of this organization.

Chemical Research

Many of the special problems on both drinking water and polluted streams require more or less detailed research in the Chemical and Research Laboratories of the Station. All analytical work is done in accord with Standard Methods, but in preparation of samples, and especially when dealing with pollutants or metals in very low concentration in waters high in organic matter or otherwise grossly polluted, adaptations are often necessary. Practically all the methods for metals include the use of electronic determinations. Among the important tests for which special means have been developed are the following:— cadmium, chromium, copper, for which there are three methods, iron (in many forms), lithium, phosphorus, potassium and sodium. Two special methods for the very difficult determination of sulfates in small concentrations have also been developed. In addition, methods have been adapted for the determination of the many different kinds of detergents which are now encountered in the work on streams. A special method of determination was evolved for the presence of phenols and similar compounds, which may cause undesirable tastes and odors in concentrations of only a few parts per billion. Other special analyses evolved or adapted include those for DDT, several herbicides, and oils, pigments and carriers resulting from the discharge of paint and oils into the water.

In connection with the representation of the Station on the Standard Methods Committee in the Federation of Sewage and Industrial Wastes Associations, a large amount of research work has been done in regard to the more accurate determination of chlorine and chlorine compounds and of chlorine dioxide and other oxidizing agents in very small concentrations in water. This work also involves the study of tastes and odors associated with oxidizing materials. Similar work has resulted from the use of chlorine-bearing starches and other organic materials.

Another special series of determinations was made in regard to more accurate methods for the determination of fats, oils and grease in sewage sludges. As a result of this work it was concluded that for most purposes the method in use at the Experiment Station since 1890, which consists of evaporation barely to dryness, followed by extraction with hexane or occasionally some other solvent, gave results at least as good as proposed methods of extraction, followed or preceded by freezing, centrifuging and similar assistance.

The use of the polarograph in many determinations, but particularly in regard to the determination of dissolved oxygen, especially in connection with determinations of B.O.D., has resulted in the preparation of methods which are very valuable in certain cases where extremely accurate work is required.

Other work involves the study of the effect of acetic acid and other similar organic acids on the determination of B.O.D. It is believed also that determinations of B.O.D. as presently made are essentially much more accurate and much more representative because of the intensive study on adequate methods of seeding.

Bacterial Research

During the past seven years the Bacteriological Laboratory has examined a total of almost 130,000 samples. Many of these were in connection with the sanitary control of water supplies and of other waters in the State and in connection with stream pollution work. In addition a very large amount of work has been conducted in connection with the research in regard to the purification of sewage and biological treatment of industrial wastes or sewage containing such wastes. Since, as will be discussed more fully later, a very large part of the wastes upon which investigations are made are of a somewhat toxic or inhibitory nature, it is often found difficult to bring about the formation of adequate flora for biological treatment. More and more, therefore, it has been found valuable and useful to enlist the assistance of the Bacteriological Laboratory in all stages of treatment of industrial wastes.

In addition, it is constantly necessary to continue examination of the methods in use in determining bacterial content of waters. Since the Station is represented on the committee responsible for bacteriological procedures under Standard Methods, all of the determinations made at the Bacteriological Laboratory follow these standard procedures. However, there are many methods other than those considered standard which are presented for evaluation. Several times previously it has been found that, in general, media and methods intended to assist bacteriological personnel in differentiating the various members of the indicator coliform group and of other organisms commonly found in water and sewage tend to retard or prevent the growth of the characteristic organisms which are being sought. In this respect the Station in cooperation with other laboratories has conducted a series of tests involving many thousands of cultures. As a result of this work the Station and the bacteriological laboratories of many other very important states are convinced that for the present our methods called "Confirmed" and "Completed" are sufficiently accurate and represent, when properly carried out, adequate pictures of the sanitary quality of the water under examination with regard to the present standard for the presence of coliform organisms, which is one such organism per 100 ml. of the water examined.

It is felt strongly that any attempt to use only certain members of the coliform group or to depart in any material way from the present standard would result either in the acceptance of waters somewhat below the present standard of purity or undue efforts on the part of certain water supplies to reach an unnecessarily high standard. At the same time the Station has continued to urge water department personnel who can do so to produce water containing bacteria far below the present standard.

On many water supplies, oftentimes in connection with work involving tastes, odors and colors, the Bacteriological Laboratory has made examination of slimes found in the distribution systems, and especially in dead ends or in parts of the systems with relatively little flow. Differentiations of organisms found in some of these sites have shown that in many cases these organisms must be regarded as degraded members of the coliform group. It has also been found that these organisms tend to resist dosages of chlorine which are almost completely fatal to normal coliform organisms. It is felt that these resistant organisms in general cannot be considered as true indicators of bacterial quality, but that they must be regarded as undesirable since they may indicate improper design or inadequate treatment.

For a great many years lactose broth has been the only standard medium for determining the presumptive presence of coliform organisms in drinking water. For a great many years the Station has conducted investigations into other preliminary media and a special value has been attached to a Lauryl tryptose broth, which is particularly valuable because of the presence of surface tension reduction agents and the products of digestion of meat which are particularly valuable in rapid growth of coliform organisms and tend to reduce the growth of non-coliform organisms to a somewhat greater degree than does standard lactose broth. Under the leadership of the Experiment Station, a detailed comparison for these two media

was conducted. The results were presented at a meeting of the APHA, and as a result of this work Standard Methods now permit the use of the LT media in primary water examination.

Another intensive investigation was in regard to dehydrated media. It was found that practically all of the dehydrated products now available in the market are very high in quality. It was also found that many small laboratories tend to purchase dehydrated media in large-sized packages for the sake of economy, and since such packages may not be used for a period sometimes in excess of a year, serious deterioration was experienced, with disastrous effects on bacteriological determinations. In this same connection it was found that media prepared from these dehydrated products and stored for several weeks or months tended to show undesirable changes which interfered with the best determinations. As a result of this work by the Experiment Station and by other laboratories, Standard Methods require the use of dehydrated media in all but the very large laboratories. In Massachusetts all laboratories approved for examination of water must purchase dehydrated media in sufficiently small quantities to avoid the difficulties due to excessive storage.

As stated above, a very great majority of samples from public water supplies are sent to the Experiment Station by mail or by express and are necessarily in transit for periods up to, but generally not exceeding, 24 hours. This is also true of the laboratories of the United States Public Health Service and of most of the larger states, and for many years personnel in charge of these laboratories have been concerned over the possibility of changes during such periods of storage or transit which might interfere with the laboratory's returning the proper picture of the waters under investigation. For several years, under the auspices of the Standard Methods Committee for the Examination of Water, investigations have been under way and the Experiment Station has conducted several such surveys. In 1955, a paper was prepared by the Experiment Station analyzing the results of samples collected and examined over the period of a year by the New York and Massachusetts Departments which had been stored both at room temperature and at refrigerated temperature for 24 hours.

The conclusions reached after this examination of several thousand such samples were that under normal circumstances, and except possibly in extremely hot or extremely cold weather, samples of normal surface water supplies which were received at a laboratory within 24 hours after collection could be accepted as presenting a proper picture of the sanitary quality of the water at the time of collection. There still remains the problem of samples remaining under excessive temperatures and for periods longer than 24 hours, and at the present time efforts are being made for a federal grant to permit an intensive study of samples at the Experiment Station.

COMPARISON OF THE MEDIAN RATIOS OF STORED MPN TO INITIAL MPN

TABLE I — *Massachusetts Water*

	No. of Samples	24-hr. Room Storage MPN to Initial MPN		24-hr. Refrigerator Storage MPN to Initial MPN	
		Median Ratio	95% Confidence Limits	Median Ratio	95% Confidence Limits
Year	190	.915	.77–1.00	.86	.76– .97
Summer (May–October)	100	.74	.63– .92	.88	.77–1.10
Winter (November–April)	90	1.12	.85–1.20	.825	.73– .93
MPN — 23 or less	59	1.07	.90–1.8	.89	.63–1.3
24–79	53	1.02	.75–1.39	.92	.78–1.21
80–230	52	.71	.53– .92	.755	.46– .97
over 230	26	.61	.31–1.1	.77	.50–1.0

TABLE II — *New York Water*

Year	69	.66	.51– .96	.74	.60–1.00
Summer (May–October)	32	.67	.39–1.28	.78	.52–1.23
Winter (November–April)	37	.66	.50– .96	.67	.48–1.00
MPN — 23 or less	27	1.02	.65–1.49	1.00	.67–1.77
23–230	23	.51	.29– .97	.67	.42–1.22
over 230	19	.51	.39– .74	.52	.45–1.09

Another field in which the Experiment Station has conducted a very significant research is in regard to the membrane filter which has been under study to a considerable extent ever since it was in use in Germany during the late World War. Methods of manufacture have now made it possible to produce uniform membranes of any desired porosity and the mechanical equipment for using the membranes has been highly developed. However, although many attempts have been made to produce a standard medium for determining the presence of coliform bacteria with these membranes, there still remains a very considerable degree of question as to the results obtained. For the past four years the Experiment Station has conducted more intensive work with the MF in an effort to overcome some of the difficulties.

In 1955, a compilation was made and presented to the APHA entitled "Comparative Densities by the Membrane Filter Test and by the Multi-tube Technique of Standard Methods." This paper presented the results of a study of several thousand samples and showed the inaccuracies or inconsistency also affected by time of incubation, type of water, and methods of counting and other examination, all in addition to difficulties encountered from apparently inadequate medium. It was particularly pointed out that best results were obtained when coliform contamination was relatively fresh and unmixed with other organisms but that results as compared with the Standard Methods became progressively worse with time of storage of waters or the influx of relatively large numbers of soil or other organisms (Figure 7). It was also shown that under optimum conditions it was possible to obtain results from the membrane filter method practically identical with those from the Standard technique, but that the two methods would not necessarily determine the same types of organisms. It was also indicated that none of the media available were entirely satisfactory. This work like that of other investigations shows that if the membrane filter should be substituted for the Standard technique a new standard of bacterial purity would have to be used and that at present our information is not sufficient to set such a standard. Work on the membrane filter has continued during the year following the presentation of this paper and it is obvious that improvements as a result of our work and that of other investigators are being made, but there still remains a very considerable amount of investigation. Requests for a grant to continue this work are also being made.

For the past seven years, in connection with the approval of other laboratories by the Department, approval has been given several laboratories for the determination of coliform bacteria in water supplies. The examination and approval of such laboratories has been a function of the Experiment Station and at the present time there are over 40 laboratories approved. It is felt that, as a result of standards for equipment, personnel and such details as the required use of dehydrated media, the work of the smaller laboratories has definitely improved during the past few years. It is believed to be particularly useful that these approved laboratories have been urged to record and report their work in a form as close as possible to that used in the Experiment Station so that the work of these laboratories on public or private water supplies may be readily compared with that of the Station.

Shellfish Research

During the past seven-year period the Station has continued to exercise supervision over the Newburyport Shellfish Treatment Plant by means of frequent visits and inspections, and check chemical and bacterial examinations. Further studies on the methods of cleaning have been carried on, in conjunction with the engineers of the Division, and a procedure which promises much improved efficiency is ready for use whenever the proper treatment facilities are provided.

The Station has continued to receive and analyze samples of water and shellfish from all of the areas of the State.

Research into methods of analysis has been practically continuous. The nationwide approved method of sample preparation calls for maceration of the shellfish meats. The type of emulsion thus prepared varies widely with the species, the size, and the freshness of the shellfish, with probable additional variation from one

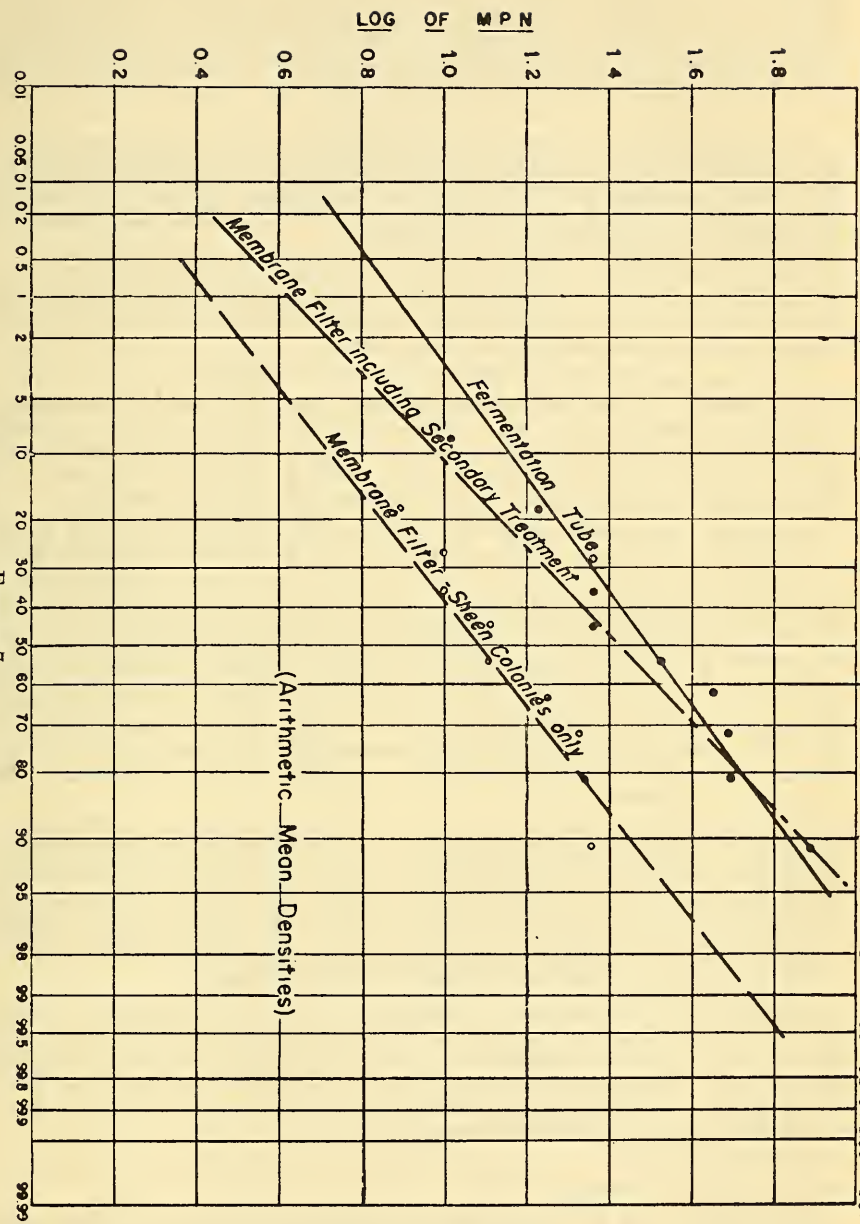

FIGURE 7
Tube MPN vs. Membrane Filter MPN

season of the year to another; in addition macerators apparently quite identical may produce different sample preparations. For the determination of the coliform group, which is the most common indicator of pollution, present Standard Methods permit the use of lactose broth or lauryl tryptose broth. When portions of samples prepared in accordance with Standard Methods are inoculated into either medium the relatively high content of muscle sugar in soft clams and quahogs, the shellfish most commonly received in our laboratory, as compared to oysters, which are more common in most other parts of the country, tends to upset the intended concentration of the medium and to produce false results.

These conditions have been carefully reported to the APHA Committee on Standard Methods for the Examination of Shellfish, on which the Station is represented, and it is hoped that the forthcoming edition of Standard Methods will permit sufficient tolerance in procedure to give optimum results in the examination of shellfish most important to New England.

The relative significance of E. coli and of the whole coliform group also appears to be different in our soft clams than in oysters, especially those grown in the warmer southern beds. For this reason the Station has consistently opposed the use of E. coli alone as an indicator of pollution.

Partly because of confusion regarding coliform significance, the use of coccal forms, especially of fecal streptococci, has been suggested to replace or supplement coliforms as indicator organisms. Although methods available for the determination of fecal streptococci have greatly improved as a result of studies in which the Station has participated, it still is not the opinion of the Station that the use of these organisms for anything but supplementary information is justified.

For many years the problems of serious deterioration, and especially greatly increased coliform content in clams and particularly in mussels shipped from Maine to Massachusetts or New York, or from Massachusetts to New York, have troubled the various agencies involved. As a result of conferences of New York and New England States, held at the Experiment Station, cooperative shipping and analytical experiments were conducted, as a result of which it appeared possible to state that soft clams could be shipped anywhere and anytime within the New England States and to New York with adequate care in regard to handling at the source, containers, refrigeration and ventilation without significant effect on quality and particularly the coliform content; but that during the summer months it was not probable that mussels shipped to New York would be acceptable unless prohibitively costly methods were employed.

The Station was invited to participate in a national conference in Washington, sponsored by several Federal agencies, on mussel poisoning, which had become prevalent in Alaska and on the West Coast. A long series of analyses by the Station in 1943 had shown that the disease was not present along the New England coast, and this is still true. However, the Station will be expected to resume its testing program if the poisoning should appear along the Atlantic, and we have information and most of the apparatus necessary for such testing.

Other shellfish work included participation in studies of the sanitation of lobster and crabmeat opening and packing, including experiments at the Station. The Station also developed a satisfactory method for dyeing soft clams presumably dug for bait to prevent their being sold for food. A series of experiments indicated that aureomycin could not be satisfactorily used to reduce the bacterial content of soft clams or to maintain their freshness.

Sewage Treatment Research

In connection with sewage disposal the standard procedure up to 1955 was to examine a series of samples from each treatment plant in the State several times each year. In the past two years, this practice has been supplemented or replaced by a one or two day inspection by one or more engineers, generally those stationed at Lawrence, which includes the collection of samples over a period of at least 24 hours. This work has been integrated with the stream pollution program of the

Division. In many cases the samples from the sewage treatment plants, and in some cases of sewage discharged without treatment, can be correlated with those from receiving streams. In the past few years this work has been supplemented by determinations of the rates of deaeration and aeration of the streams. In many cases there have been simultaneous examinations of industrial wastes, and this has required many times special determinations of metals, of paints, of oils and greases, of detergents, and of other materials which make the sewage of today a very complex mixture. It was often necessary to devise new methods, or to adapt old ones to make these determinations.

As usual, the Station has made many analyses of sand and stone and other filter materials intended for use in new or enlarged municipal treatment plants. Special analyses usually for the determination of nitrogen and organic matter have been made from practically every treatment plant using slow sand filters, including many State institutions, to assist the engineers in regard to cleaning, or additions or replacements, but a much greater number of analyses, particularly of sand and soil, has been in connection with sewage disposal in rural areas and other regions of the State which are, because of the rapid growth of many cities and towns, not served by municipal sewers. In addition to the usual analyses on these samples, it was often necessary to set up percolation experiments.

At the old Station a group of septic tanks and several subsurface disposal areas had been in operation for many years. From these experiments there have been gathered much valuable data in regard to tank dimensions, detention time, significant methods of analysis, sludge accumulation, and especially the degree of treatment by septic tank most suited for disposal in a given soil. It was shown for instance that in relatively very fine soil, the inorganic suspended solid content of the effluent has a very important effect on the adequacy and permanence of a receiving field.

The Station also for many years had the opportunity of measuring and observing the operation of several large disposal fields nearby. As a result of all of these studies, the Station was able to make significant contributions to the bulletin on rural sewage disposal prepared by the Division.

In the last year of the old Station the study of trickling filters, which had gone on without interruption since 1890, was continued until the end of 1953. During most of those years a group of a dozen filters was operated with relatively heavy liquid rates and high B.O.D. loadings; most of the filters were operated in sets to show effect of such factors as depth and type of stone, sedimentation, and recirculation, as well as secondary or two-stage treatment. Several conclusions have been reported from year to year from this work. Single-pass trickling filters receiving enormous loadings up to 20,000 pounds per acre-foot per day still showed a degree of purification; although the removal of B.O.D. and of suspended solids might be as low as 20% of the loadings applied, nevertheless the filter did effect a real change in the sewage applied. Filters on which the effluent was recirculated one or more times gave materially greater reductions in B.O.D. than similar filters receiving the same load but with no recirculation. This improvement was relatively slight with raw B.O.D. loadings of 1,000 pounds or less per acre-foot, but the relative efficiency increased rapidly with loadings increasing from 1,500 to 7,000 pounds. Increasing the number of passages through the filter from one time to three or four materially improves the efficiency of the filter; further increases give very little if any added improvement. Both single-pass and recirculated filters showed fairly sharp decreases in percentage B.O.D. removal up to about 7,000 pounds loading, and with loads further increased the efficiency expressed in per cent dropped very slowly. In Figure 8 the average per cent of B.O.D. removal and the average pounds removed per acre-foot per day is plotted against all the loading for both single-pass and recirculated filters operated from 1941 to 1955. The curves of percentage of removal are similar in that they show a deflection at about 7,000 pounds loading. The improvement in efficiency effected by recirculation is plainly shown. The curves for removal in pounds per acre-foot are quite different; that for the recirculated filters is practically a straight line up to a loading of 12,000

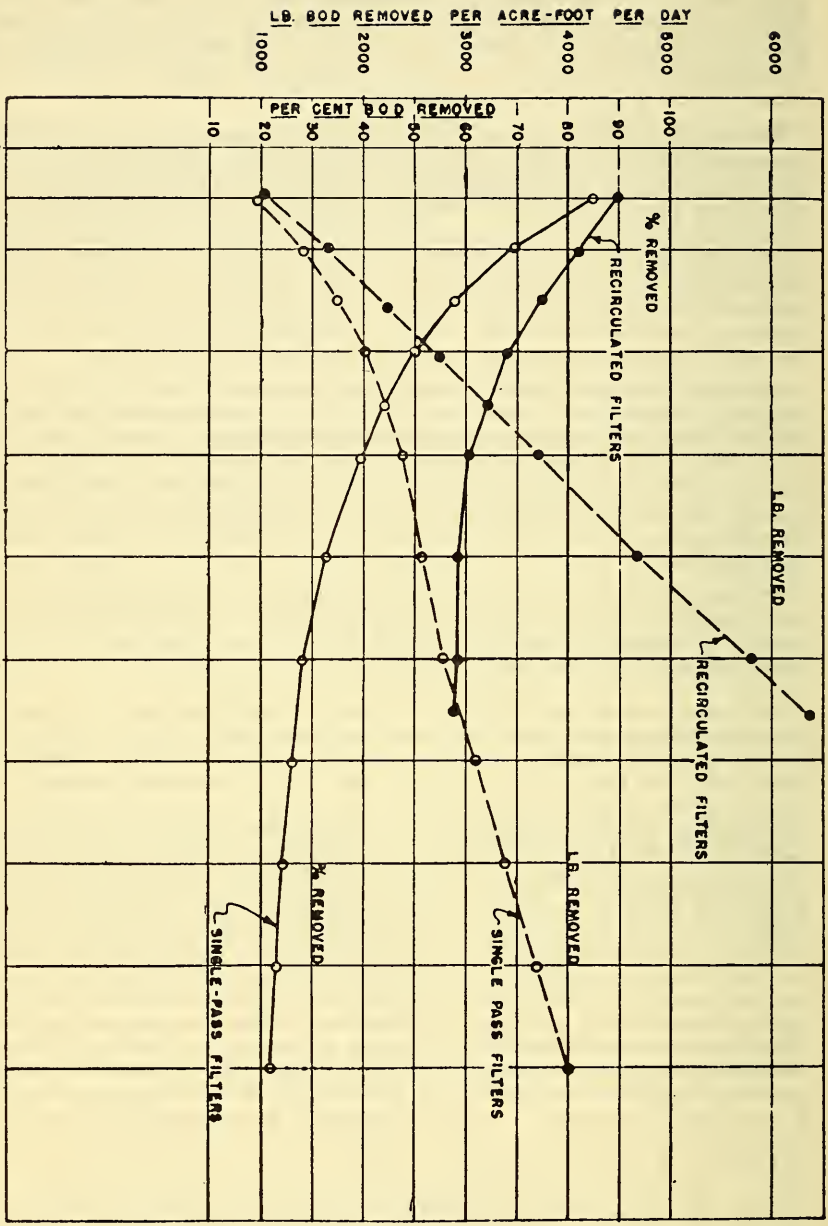

FIGURE 8
Performance of Trickling Filters: Removal of B.O.D., 1949–1955

pounds, but the curve for the single-pass filters shows a fairly sharp deflection at about 4,000 pounds loading, and from this point the ratio of removal to the applied is much less.

For any given B.O.D. loading from 1,000 to 10,000 pounds per acre-foot per day a filter with or without recirculation with six feet of stone gives much greater B.O.D. efficiency than filters with only three feet or four feet, and the differentiation increases in proportion to increasing load. Removal of suspended solids is also better, but the difference in loadings up to about 2,000 pounds is very small.

The efficiency in pounds removed per acre-foot of systems, including two trickling filters in series, was generally less than that of a single filter with the same net loading, but if the order of receiving the sewage was alternated once a week, the overall efficiency of the combined system was much increased.

The period of detention in intermediate settling tanks in recirculating filters had an important effect on the normal efficiency. Longer detention gave improved settling but decrease in dissolved oxygen, with the net result that within reasonable limits efficiency was improved by reducing the detention time as the load increased. Aeration of intermediate tanks was not successful except with very heavy loadings. It is interesting to note that in later experiments with highly organic waste a very definite improvement in trickling filter efficiency was effected by intermediate aeration.

Secondary filtration of settled trickling filter effluents on four-foot beds of sands showed that highly satisfactory effluents could be obtained with continuous loadings up to 250 pounds of B.O.D. per acre, as against a normally accepted loading of 100 pounds; and that for short periods loadings could be increased to 350 pounds per acre without serious injury for the filter or undue deterioration of the effluent.

In the new Station a continuous uniform supply of settled domestic sewage is available throughout the research area. The system of sumps, pumps, tanks and distribution pipe was fully described in the 1955 report of the Division. There are now in operation 11 experimental trickling filters. Of these eight are arranged in four pairs, each pair being operated in exactly the same way as far as possible. Frequent analyses over a period of one and one-half years indicate that it is possible to operate such filters so as to obtain results which are statistically alike, and thus to indicate that results reported from the operation of a single filter have a reasonable degree of reliability. The group of filters have also contributed further data confirming our results on the effect of B.O.D. loading.

Industrial Wastes

In the past seven years in addition to the examination of over 1,000 samples of industrial wastes in connection with stream pollution, the Station has investigated wastes from 27 types of industries located in 35 cities and towns. In every case more or less research work was necessary; in many cases field assistance was given and in several, extensive investigations, generally including operation of biological units, oftentimes with chemical or other pretreatment methods were conducted. In many cases the wastes were of types formerly considered difficult or indeed impossible to treat biologically because of their toxicity or other inhibitory characteristics.

For over 60 years this Station has been interested in the treatment of wastes from the textile industry. Although a great many of the larger woolen plants have left Massachusetts, there are still large quantities of textile wastes discharged in many parts of the State; and because of changes in processing and especially because of the growing use of man-made fibers there are still many problems in the disposal of textile wastes. The most important waste formerly was that from the scouring of wool and this is still a serious problem, although the amount of wool now scoured in all of Massachusetts is probably less than that once processed in greater Lawrence alone. This waste is particularly important because of its heavy concentration of alkalinity, grease and B.O.D., of which each 100 pounds of wool scoured may contribute as much as nine pounds.

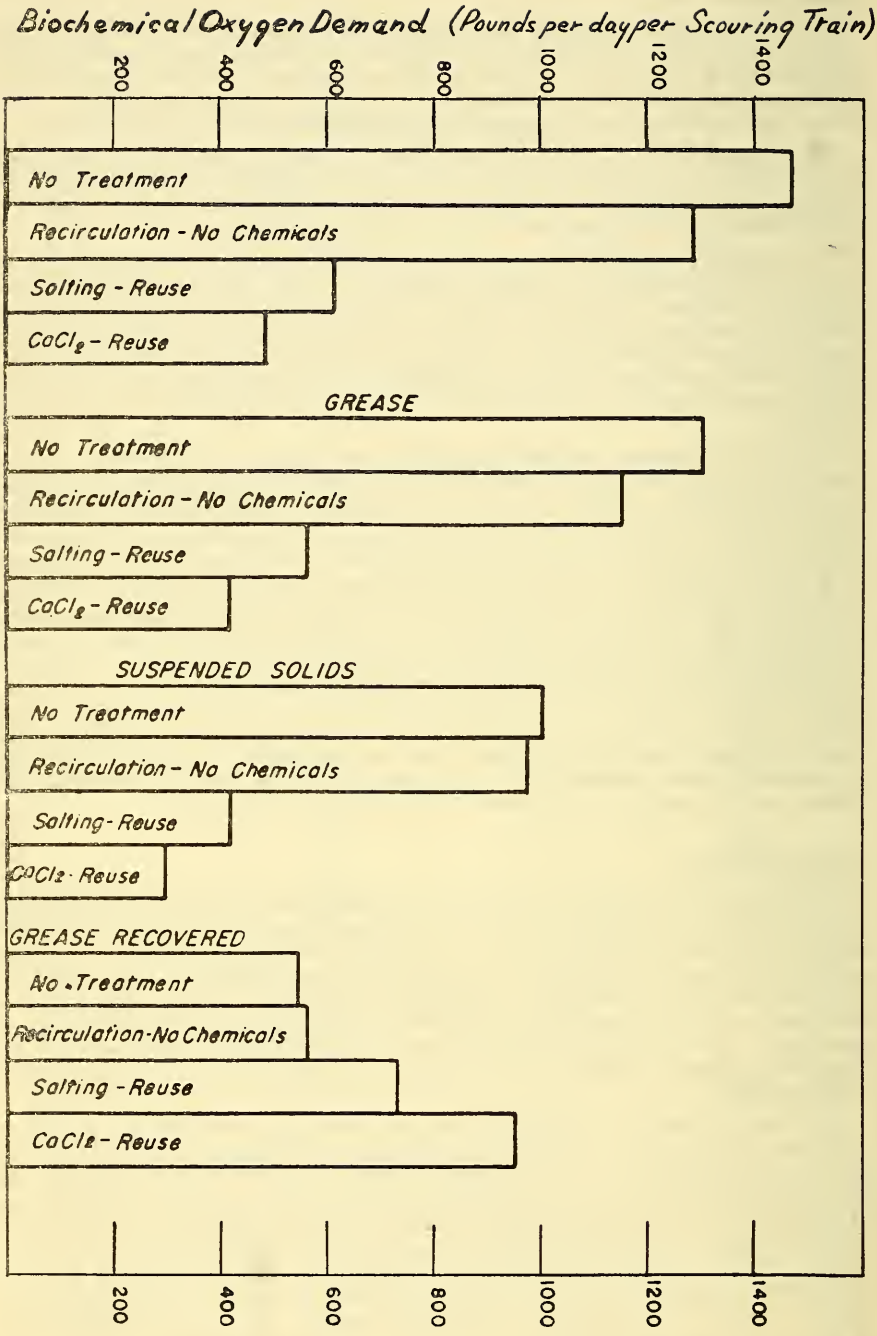

FIGURE 9
Effect of Calcium Chloride Treatment of Wool Scouring Wastes

In 1947, a process was developed at the Station which used carbon dioxide to reduce the alkalinity of the wool scourings and calcium chloride to break the fatty emulsions. Very satisfactory reductions of waste constituents were obtained in the laboratory and also in several scouring plants which adopted the process (Figure 9). Meanwhile further work at the Station showed that, when the calcium chloride was added to the wastes at temperatures near the boiling point, the reaction was accelerated so that classification of the wastes was complete in five to ten minutes instead of two hours in the first of the work process, but the resulting sludge was compact and could be quite readily processed for the recovery of grease and 80 per cent of the B.O.D. of the original wastes could be removed. It was also found possible to use with a fair degree of success common salt in place of calcium chloride at the higher temperature. One of the local mills adopted this process and found that the clarified liquor could be returned to the scouring bowls at a very considerable saving in chemicals. With this recycling process it was found that the net discharge of B.O.D. and of grease decreased over 60 per cent and the reduction in suspended solids was over 80 per cent from the figures before the process was in use. It was also found that the recovery of usable grease increased almost 100 per cent.

Changes in dyeing, particularly those involving the use of high pressures in the process, also made material differences in both the character and concentration of dyeing wastes. Extensive studies at the Station resulted in a satisfactory evaluation of the new wastes, and extensive experiments showed that with proper adjustment of pH and additions of nitrogen and phosphorus very satisfactory treatment could be accomplished on biological units. Another new development in dyeing resulted from the use of copper as a mordant in the dyeing of artificial fibers. Investigation showed that sufficient amounts of copper were discharged so that the wastes when carried to a municipal treatment plant could cause considerable interference in sludge digestion. The Station has cooperated with the Lowell Technological Institute on these and other problems regarding textile wastes.

Other extensive investigations were concerned with the manufacture of artificial fibers. It was found that in almost every case such wastes were bactericidal in nature and normally would not have been regarded as amenable to biological treatment. In several series of experiments, which included the use of the Warburg apparatus and extensive use of shaking equipment and particularly of a good deal of patience, it was found possible to develop bacterial flora either in trickling filters or aeration equipment which gave very satisfactory reductions in B.O.D.

Another waste in which extensive studies were made was that of processing flax in the manufacture of cigarette papers. With the cooperation of one of the industries engaged in this manufacture the waste was studied for almost a year. The character of the inhibiting substances was examined and found to consist of reducing sugars and various sulphur compounds, and nevertheless by the development of several cultures it was found possible to treat these wastes biologically. A series of three reports on this subject was prepared by the Department.

Work of quite a similar nature included investigation of polymerizing wastes, and other intermediates from the manufacture of plastics and wastes containing phenols and cresols. These latter substances are particularly important because in concentrations of only a few parts per billion they impart a very undesirable taste to water. All of these wastes likewise were found to be amenable to biological treatment.

Another chemical waste upon which the Station has worked periodically for many years includes formaldehyde and methyl alcohol among the inhibiting substances. The industry producing this waste has built a large treatment plant with the cooperation of the Station in its original design and maintenance and it is interesting to note that formaldehyde in concentrations up to 1200 parts, or that found in material advertised as disinfectant, has been satisfactorily reduced by biological means to five to ten parts per million.

Other inhibiting wastes, including those containing prussic acid and its derivatives from plating, high acid and high iron wastes from steel manufacture and rouge

wastes from the manufacture and processing of glass were shown to be satisfactorily treated by the same calcium chloride process which had been used for the wool scouring wastes.

Organic wastes which were subjected to experimental research included those from the manufacture and processing of fish meal, waste from the manufacture of gelatin and ice cream, several wastes from the meat packing industry, wastes from the cranberry industry on the Cape, wastes very high in fiber content from a fulling mill and a continuation of the work on laundry wastes. Two of the most unusual wastes were those from processing of sea moss and the manufacture of pickles and other condiments.

Training Activities

Practically all the colleges nearby regularly send one or more classes each year to visit the Station, and often members of these groups make individual visits later. Several hospitals also include visits to the Station as part of their training programs, and school children, Scout groups, and other youth organizations now make annual visits.

As previously indicated, representatives of many of the water and sewage treatment plants have spent more or less time at the Station for training, and this practice is growing. In addition, the orientation and indoctrination courses of the Department always include some time at the Station.

Since the new building was put into use, there have been several formal courses, lasting three or four days, given on water bacteriology, the membrane filter, and limnology. In addition there have been 18 foreign students, brought to the United States by Federal agencies, who have spent from two weeks to six months in training at the Station.

Radiological Studies

Since 1951 instruments for the measurement of radioactive emanations have been in use at the Station. The first work was on measurement of the natural activity, or background, of the water supplies of the State, all of which have been examined once or several times since. A little later the same levels were found for many of the streams in the State, especially those used for water supply, or those covered by our pollution studies. Almost from the beginning measurements have also been made of all the precipitation; this has been frequently in cooperation with various Federal agencies. These measurements became important during the several series of experiments conducted by the Armed Forces. The results obtained here and elsewhere have served to establish the patterns of passage of atmospheric contamination.

From time to time new equipment has been received for measurement of air volumes and for more accurate and more differential determination of various types of emanations for use by Civil Defense authorities and by Federal agencies.

The Station made studies of the effect of normal water filtration processes on radioactive fallout, which have been published in connection with other studies at Harvard University under the auspices of the AEC. These indicated that, although considerable removal took place, normal filtration was by no means sufficient to remove dangerous concentrations.

In another series of experiments the Station cooperated with the AEC and Harvard University in the measurement of isotopes deposited in Cochichewick Brook in North Andover, and measured for several days thereafter. The results of this study have also been published by the AEC.

Plumbing Laboratory

To help in obtaining a better understanding of the public health problems which result from faulty plumbing, the Department provided space on three floors of the new Lawrence Experiment Station for a Plumbing Laboratory. Special facilities have been designed and installed for the three-fold purpose of training, testing

and research. Classes have been held for plumbers, public health workers and others to explain and demonstrate the public health hazards in plumbing systems.

Special facilities of the laboratory include double check valve assemblies to show how potable water supplies must be protected against pollution when an auxiliary water supply is used in the same building; a thirty-five foot hydraulic leg of clear plastic pipe extending from the basement to the ceiling of the second floor shows how high water can be siphoned in a plumbing system and the danger that may exist from back-siphonage of water from plumbing fixtures; a hot water tank and heater is used to show water circulation, stratification, temperature and pressure build up; emphasis is placed on the danger from explosion if hot water systems are not properly installed and equipped with necessary safety devices; a high rate vacuum pump with tank and accessories will make it possible to carry on special demonstrations, tests and research over a range of controlled vacuum and pressure conditions; there are classroom facilities for 25 students.

The program of training is aimed particularly at helping the apprentice plumber have a better understanding of his importance and responsibilities in protecting the public health. It includes a course or series of lectures and demonstrations on the basic principles of hydraulics and public health for plumbers, plumbing inspectors, sanitary engineers and others. The training has been and will be developed with assistance of representatives of the plumbing trade, trade schools and the apprentice training program.

Additional Information

Additional information is contained in Appendices A through J, which will be furnished by the Division of Sanitary Engineering on request.

Appendix A: Acquisition of Land for Protection of Water Supplies.

Appendix B: Average Daily Consumption of Water in Various Cities and Towns, 1950–1955, inclusive.

Appendix C: Summary of Water Treatment Plants.

Appendix D: Analyses of the Water of Public Water Supplies, for 1955: Surface Water Sources.

Appendix E: Analyses of the Water of Public Water Supplies for 1955: Ground Water Sources.

Appendix F: Status of Fluoridation of Water Supplies.

Appendix G: Summary of Work Done in Institutions.

Appendix H: Legislative Reports.

Appendix I: Cities and Towns in Which Rules and Regulations Are Effective.

Appendix J: Sewage Treatment Plant Data.

DIVISION OF FOOD AND DRUGS

Section 5, Chapter 111 of the General Laws states in part, as it pertains to food and drugs, that the Department of Public Health shall take cognizance of the interests of health and life among the citizens of the Commonwealth concerning conditions and circumstances relative to the sale of drugs and food and adulteration thereof. The law then proceeds to set forth, in Chapter 94, many definitions and conditions affecting the sale of food and drugs. The Department has placed the responsibility for the enforcement of Chapter 94 and related sections as the duty of the Division of Food and Drugs.

The Division has carried on certain routine operations, as usual. However, in writing this combined annual report, the author would be remiss in not stating the pressing need for more personnel and funds to enforce the laws which place upon the Division, on behalf of the Department, considerable urgent responsibilities.

In order that one may properly evaluate the tremendous responsibilities generated by the food section of the industrial revolution which has come about following World War II, one has merely to reflect upon the billions of dollars' worth of chemicals now being sold to the food industry for incorporation into foodstuffs. In some cases incorporation of chemicals is, in the opinion of this Division, in the interest of the consumer; but in most cases it is not. Chemical industries expend many millions of dollars in retaining high-priced experts to carry on their technological advances to develop new ways and means wherein their chemicals can be incorporated into the greatest business of all — the food business. To cope with these experts, the Commonwealth's Division of Food and Drugs operates in old, outmoded laboratories, with insufficient personnel to deal with even routine problems, let alone complicated research programs.

Considerable time has been spent by the Director, working with Governor Herter's Labor and Management Committee, studying all aspects of the fishing industry and related activities of the present Fish Inspection Program of the Commonwealth. Legislation which would transfer the present fish inspectors from the Department of Natural Resources to the Department of Public Health was discussed by the Committee. Also discussed was the recommendation that a research program be carried on for one year by qualified food technologists, working under the supervision of a highly qualified research consultant. This research team would attempt to set up rapid tests for the grading of fish; investigate establishments used for the preparing, cooking, freezing and distribution of fish; investigate the facilities available on fishing boats; and make recommendations for improvement of the quality of fish brought into our port. The program would be financed by the industry through a licensing program in which industry would participate.

A gradual change in divisional policy toward violators of the laws and regulations entrusted to this Division for enforcement has evolved during the past six years through closer cooperation with local health departments and an expansion in inspectional and administrative services, to include not only an enforcement program but also an educational program. Although this program has imposed an additional burden upon the personnel of this Division, the results have been highly gratifying. Much of the overlapping of State and local services has been eliminated, and closer cooperation with the regulated industries has resulted. Local health agents, inspectors and sanitarians have allowed us to coordinate their efforts to such a degree that hardly a day passes that several of them do not see fit to call the Division's offices for advice and assistance. The response of industry to the educational program has resulted in the expenditure of hundreds of thousands of dollars in the renovation of obsolete establishments, or in the erection of new plants when renovation was inadvisable.

One of the major problems of this Division has been to see that the requirements of the laws as they pertain to food have been conformed to. Since the industries have realized that we are all working toward a common goal, that is, to see that the consumer receives a safe, clean and nutritious article of food, and that those who are ill receive full potency and standard drugs, a great stride has been taken to reach this common goal. The Division's perspective being to forward the public

health and the welfare of the purchasing public, and the industry's perspective to produce better consumer-acceptance of their products, both stand on an equal footing, with the consumer benefiting from the joint action. Under this progressive policy, whenever a violation is discovered by the Division a hearing is held in one of our office violators in the eastern part of the Commonwealth being serviced from the Boston office, and those in the western part of the Commonwealth from our Westfield office, so that a minimum of inconvenience in attending these hearings is experienced by the violator. If it is the first violation, and upon investigation evidence indicates a lack of understanding either of food technology processes or of the requirements of the laws, the violator is shown the error of his ways and is warned that any recurrence of the violation will be considered as willful and that more severe action will be taken.

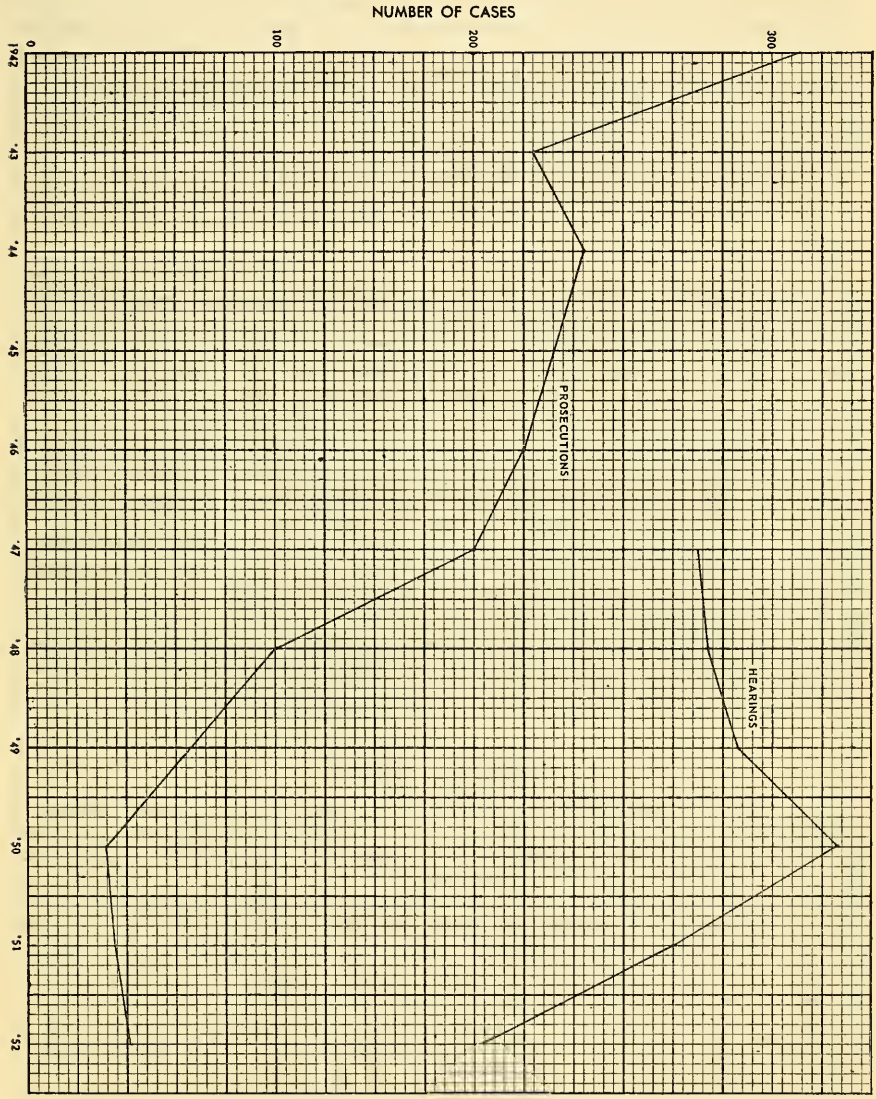

FIGURE 1
Prosecutions and Hearings, 1942–1952

Prosecutions in 1947–48 totaled 106; in 1949–50 there was a precipitous drop to only 31 prosecutions (Figure 1). A leveling off at 33 prosecutions in 1950–51 indicated a large drop in the number of prosecutions entered by the Division in the courts in comparison with a sharp increase in the number of hearings given, from 62 in 1946 to 319 in 1949–50. Since the adoption of our more progressive policy in the handling of violations, the number of prosecutions, having leveled off, is now about parallel with the drop in the number of hearings necessary. The Division feels that the number of violators is being steadily reduced by correcting those who were formerly flagrant violators and who may have been prosecuted several times with no improvement in their actual plant facilities. An increase in the number of prosecutions, to 41 in 1951–52, resulted from the extensive work done by the Division on horse meat and sulphite violations, particularly in those instances where there was a malicious intent and wilful violation of the law. Reinspections of establishments that had been renovated and modernized at our suggestion have shown that they have been eliminated from the list of constant offenders.

We hope in the continuation of our program to strive toward a goal which will eliminate obsolete and unsanitary plants from this Commonwealth so that the principles of modern sanitation can be applied to the establishments designed for their application. Of course there will always remain a certain number of malicious and wilful offenders, who must be prosecuted to the fullest extent of the law. These, however, represent a very small minority, and continued pressure will be brought to bear until they conform with the law. The Division is gradually whittling down the size of this group.

More modern food plant construction has resulted from the Division's attempt to prove to the food industry that good sanitary practice is an inherent part of good business. One large food manufacturer has gone so far as to construct a new quarter-million dollar establishment when shown by hard facts that good sanitation is good business. One large food chain spent almost one hundred thousand dollars in renovating bakeries and improving food-handling equipment.

Most of our meat markets are using temperatures close to 32 degrees Fahrenheit for their refrigerated cases instead of the previously used standard of 40 degrees, due to an intensive campaign by the Division toward this goal. The selling point of the program was the fact that meat products keep better and longer at the lower temperature. Most of our storekeepers have instituted bi-weekly deliveries of sausage meat, which was one of the items most involved in violations pertaining to decomposed meat. Here again, the storekeeper was shown that it was not only to his customers' advantage but also to his advantage to initiate such a system for purchasing sausage products. In many cases, an increase in sausage sales has resulted from this practice. During the hearings held on sausage meat violations, it was pointed out to the storekeepers that sausage meat is the most perishable meat commodity they handle and that even low temperatures of storage are not always efficacious in maintaining the purity and freshness of this product.

Emergency Duties

The Division's action as an "emergency unit" was put to severe test during the natural disasters created by Hurricanes Carol and Edna in 1954, and the floods resulting from Hurricane Diane in 1955. During the early part of September, 1954, emergencies caused by the hurricanes opened up a new phase of operation by the Division; that is, the prevention of spoilage of large quantities of food, due to power failure. Utilizing its technical knowledge, the Division's personnel, under orders from the Governor's office, after the recommendation of Dr. Kirkwood, ordered seizure of the dry ice stocks in the Commonwealth. A program of distribution of this dry ice was set up, which saved many millions of pounds of perishable food from spoilage. The potential of the Division as an agency prepared and organized to handle emergency situations was vividly demonstrated. Not only was the spoilage of many millions of pounds of food prevented but also there were removed from consumer channels large quantities of spoiled or damaged foods. The Division coordinated and facilitated the cleaning up of contaminated restaurants and food-handling establishments so that the transmission of disease through the sale of

contaminated food was prevented. Spoiled meats and other foods were immediately transferred to dumps in order that putrefaction could not become a public health hazard. Immediate sterilization of the facilities of food-handling establishments prevented their impregnation with contamination, and subsequent public health dangers were thereby averted. Here, our lack of radio communication was pointedly brought out, with telephone and other means of communication unavailable, due to power losses.

The emergency work connected with Hurricanes Carol and Edna, which also included the salvaging or segregation of damaged food and drug products totaling many millions of pounds, kept the Division fully occupied for almost two months. Our already skeletonized program of food and drug supervision was further hampered. This, of course, could not be avoided, due to the pressing demands of the emergency work. Millions of dollars' worth of food which had become contaminated as the result of the disasters were seized and destroyed by the Division's inspectors.

Mopping-up operations were just about completed in October and we then had the task of destroying large quantities of liquor stocks, in conjunction with agents of the Alcohol Tax Unit of the Federal Government, said liquor having been contaminated by flood waters. The total value of the food and liquor destroyed by the Division as the result of contamination was approximately $10,000,000.

New Developments in the Food Industry

Frozen and Pre-Cooked Foods

One of the most radical changes in the presentation of foods to the consuming public, by a highly competitive food distribution system, is the increasing use of frozen foods and the advent of frozen pre-cooked foods. Catering to the ever expanding philosophy of merchandising, that anything that will make the housewife's task easier is a good business venture, hundreds of frozen food processing plants have sprung up in Massachusetts. Such items as frozen pre-cooked fish sticks, pizzas, chicken dinners, etc. have become commonplace. This is a very serious public health problem, since many persons have the concept that all one has to do in the preparing of a frozen food is to process it, put it in a home freezer, and sell it as a frozen food product. This, of course, is far removed from the truth. Raw materials going into frozen foods must be of excellent quality before processing. Great skill is needed in the sanitary preparation of these products, and quick-freezing equipment is mandatory in order to maintain quality, wholesomeness and nutritive value. The Division in its token supervision of this mushrooming enterprise has found extremely high coliform counts, filth and contamination as well as decomposition in many of these products. This is not limited to small producers. Contamination has been found in the products of large producers, who should have been able to prevent such contamination in view of the large technical staffs they employ to cope with these problems.

Preliminary investigations by the Division have indicated a large field of public health interest and research in the deterioration of frozen foods from a nutritional point of view. Unstable vitamins and other components are destroyed by improper handling, shipping and keeping of these foods in their transmission between manufacturer and consumer. Besides being a definite public health problem, in that the ingestion of foods which have lost certain nutritive factors in part negates the value thereof, there is the problem of violation of the adulteration laws since they contain less than the professed standard therefor. Cold storage holdings, which previously had been the overflow of seasonal purchasing procedures, have been swelled by this far-reaching phase of the food industry.

Slaughtering

Slaughterhouses

Since the adoption of the Massachusetts laws pertaining to slaughtering, many changes in the sanitary concepts of slaughtering have developed. Although our laws and regulations have kept up with these developments, the physical establish-

ments of our State-inspected slaughterhouses have not. As in all matters, a point is finally reached wherein good public health practice cannot tolerate the maintenance of decrepit and obsolete construction not conducive to proper sanitation.

A program has been initiated to improve the conditions in this type of establishment, which conditions have now become greatly intensified, due to the closing of the slaughterhouses connected with the Brighton abattoir. Our program has been hampered by the illness of one of our veterinary food inspectors.

Poultry Slaughtering

On a par with the expansion in the frozen food industry has been expansion in the poultry slaughtering industry in Massachusetts. During the last decade, poultry consumption in this Commonwealth has increased in the various categories on the average of tenfold. Innovations in the marketing of poultry in the cut-up form have provided an outlet for segments of diseased, deformed poultry. Certain unscrupulous processors will dissect a carcass, remove tumorous growths, emaciated members, diseased portions and the like and place in consumer channels those portions of the carcass which outwardly appear wholesome. Here again, the Division has not been able to extend adequate protection to the consumer from this type of operation due to our lack of personnel. Seizures of poultry made by the Division have been of such serious consequence that upon presentation of evidence to lower court judges, the cases were directed to the Grand Jury for indictment and action.

Poultry products have been involved in a majority of the food poisoning cases investigated by the Division. This situation exists not only in Massachusetts but poses a problem for the entire country and has caused to be introduced before the Congress of the Uuited States legislation for Federal inspection of poultry. This, however, will not solve the problem of inspection of the product within the confines of our Commonwealth. A more progressive and comprehensive program of poultry inspection is absolutely mandatory in the interest of the public health and welfare of the consumer.

Registration of Food Processors

Although Massachusetts has long been a forerunner in progressive public health legislation pertaining to food and drugs, one of the most glaring weaknesses of the enforcement structure has been the lack of a general licensing program for food processors. Prior to the passage of legislation requiring that all food processors be registered, which became effective in 1956, any person who wished to process food in a business other than the several specific food businesses already licensed would set up certain processes, canning or freezing food without health authorities being cognizant of his operations. The initial attempt by the Department to license food processors met with severe opposition and we had to be content with a registration program. It will require some time to develop this program of registration, but it is hoped that with the cooperation of the local boards of health great benefit will result in the interest of the consuming public.

Drug Abuses

Harmful Drugs

Chapter 577 of the Acts of 1954 defines "harmful drugs" as those upon the label of which the Federal law requires the statement, "Caution. Federal law prohibits dispensing without prescription." In 1955, this definition was amended to specifically include any derivative, active principle, preparation, compound or mixture of barbituric acid, amphetamine, ergot, or any hypnotic or somnifacient drug.

Investigations by the Division have revealed that abuse of this category of drugs far surpasses the abuse of narcotic drugs. Although the regulated use of these drugs has proven to be one of the biggest boons to an ailing mankind, disastrous consequences have resulted from their abuse. Since this is a summary report, the reader is referred to a number of publications issued by the Department in detail on the findings of our investigations. Two reprehensible facets in the improper use of these drugs stand out:

First, the fact that certain members of the medical profession have been prescribing harmful drugs, such as barbiturates and amphetamines, in large quantity.

Second, that the barbiturates and amphetamines have entered the channels of narcotic drug traffic via the underworld.

In the evolvement of our present high-tension way of life, nervous disorders and mental illnesses have taken a sharp upward trend. In order to meet the demand by the medical profession for more effective medication to cope with this problem, the chemical and drug industries have developed new and more potent sedative, hypnotic, and somnifacient drugs. The introduction of these drugs has been paralleled by the introduction of new stimulant drugs represented by the amphetamine family.

With the advent of the somnifacient and stimulant drugs, abuses became evident. After World War II, public health authorities and other control officials became increasingly alarmed over these abuses. In 1948, the Massachusetts Department of Public Health introduced a bill into the State Legislature which became the Commonwealth's first harmful-drug law. Personnel, however, were not provided for its enforcement. Inspectors had to be taken from already inadequately staffed inspection programs and assigned to inspect specific complaints of abuses of the harmful drugs. The first important investigation, conducted in cooperation with the Division of Hospital Licensing, disclosed a glaring inadequacy of the law. It restricted the retail sale of harmful drugs at drugstores but did not affect their distribution at wholesale.

An inspector found 20,000 doses of barbiturates between blankets in a linen closet at a nursing home. These had been obtained from a wholesale drug house. Such incidents, together with information obtained through the special commission study, made clear the need for revision of the harmful drug law.

Harmful Drug Law Revamped

In 1954, the law was revamped to prevent the recurrence of wholesale abuses of these drugs. Specific definitions for oral and written prescription were set forth for the first time in the history of law, and an inspector was assigned to enforce it. A Federal Food and Drug Administration inspector, a Board of Pharmacy inspector, and the Division cracked down on a large wholesaler-manufacturer of barbiturates and amphetamines. Millions of capsules and tablets were confiscated and destroyed, and the operator was prosecuted. A survey of the Massachusetts College of Pharmacy revealed that huge amounts of these drugs were being legitimately prescribed. An evaluation revealed that millions of pounds were being manufactured yearly in the United States. Common drugs were being compounded with harmful ones and were being marketed in myriad combinations. While control officials were trying to evaluate the extent of the problem, our inspector, making an investigation in cooperation with two Boston policemen, came upon the first indication that barbiturates and amphetamines were being peddled by an organized gang with a modus operandi similar to that of peddlers of narcotics. Two such gangs were apprehended and prosecuted.

Again, technicalities were found in the law behind which the violator could take refuge, but emergency action by our legislature resulted in a broadening of the definition of a harmful drug and made its illegal possession a crime. The barbiturates and amphetamines have a reaction of habituating prolonged users by a little understood process, which is not technically addiction but does cause dependence upon these drugs. Such a habitué will steal or commit any other crime to acquire them. Evidence has shown prostitution, juvenile delinquency, and crime stemming from the use of these drugs. In one case, a habitué forged several prescriptions for barbiturates, but when apprehended he managed to escape a penalty for the forgery because of a legal technicality. Again, the law was amended to make the forgery of a prescription for a harmful drug a crime.

Law Enforcement

Our State, a pioneer in public health legislation, initiated the Massachusetts Narcotic Law in 1885. This was an attempt to minimize the abuse of harmful

drugs, an age-old problem which has addicted and enslaved those who have succumbed to it, resulting in many disrupted lives and all types of crime, including murder. An analysis of the problem breaks it down to two parts: drugs which emanate from the so-called legitimate channels, that is, drugs manufactured under Federal supervision and sold through legitimate drug outlets; and drugs which originate from illegitimate sources, that is, through smuggling and similar operations. For the most part, the drugs legitimately procured are used under proper direction of a physician or dentist. A small part of these drugs falls into the hands of abusers, through thefts or falsification of symptoms to physicians. Recent investigations by the Division disclosed that several addicts had obtained narcotics to supply their needs from three different physicians, who, of course, were not aware of the duplicity. Our inspector also apprehended an addict with a suitcase full of various drugs, including a quantity of narcotic drugs, acquired through falsification and theft.

It is the responsibility of this Division, acting for the Department, and of police officials, to enforce the narcotic laws. By mandate of the Legislature, the Department is required to make analyses for various police agencies in connection with narcotic law enforcement as well as to enforce the law and take cognizance of any violation thereof. Due to our lack of personnel and the lack of coordination of police agencies in this problem, very little has been done in the enforcement of these laws outside of the Boston area.

In the Division's investigation of the harmful-drug law abuses, glaring violations of the narcotic laws have been observed. We initiated the policy of attempting to coordinate police efforts with ours for more stringent enforcement and have obtained fine cooperation. Worthy of special note are the Attorney General, the Boston police, the Massachusetts Police Chief's Association, the Department of Public Safety, and the District Attorney of Suffolk County. It is hoped that when the Division obtains sufficient personnel we shall be able to further carry on this work.

Chemicals in Food

Prior to World War II, the Food and Drug Division encountered relatively few chemical additives to our vast food supply. Following World War II, our chemical industries found themselves with many millions of dollars' worth of surplus chemicals on hand and manufacturing facilities to produce thousands of tons of chemicals annually. In looking for an outlet for these products they found a ready market in the field of agricultural pesticides and insecticides. A genuine attempt was made to regulate the use of chemicals on raw agricultural products on the farm by the passage of the Miller amendment to the Federal Food and Drug Act. Since then, interpretations of the original law have broadened the base decidedly. Where the original intent was to allow for the addition of pesticides to crops in the field, the law has been used to allow for the introduction of preservatives in processed foods. This has posed a considerable problem for public health authorities since so little is known about the long-range effects these chemicals may have on the human organism, not only as each chemical is ingested individually, but in combination with the hundreds of other chemical additives. At the present time there are approximately 350 applications pending on these additives for action by the Federal Food and Drug Administration. Approximately the same number of applications are anticipated this year. In the opinion of the Director of the Division, this problem constitutes the number one health menace of our times. Every day brings about new evidences as to the fallacy that we are able to prove the safety of chemical additives to food.

Recently, in Massachusetts, one hundred young children were made ill when they ingested novelty popcorn products colored with "Orange One Certified Food Color." The Division brought this matter to the attention of the United States Food and Drug Administration, who, by exhaustive tests through the years, had certified this color as safe for use in food. It was later learned that the Administration had evidence in its possession that this particular coloring and several of its chemical brethren had carcinogenic properties. Three of these dyes have since been decerti-

fied and three are in the process of being decertified. Another common household chemical additive known as "coumarin," which is a synthetic vanilla, was also found to possess carcinogenic properties.

The case in point from the evidence on hand is that although there are many theories as to the methods of determining the safety of chemicals in food, no sure-fire, fool-proof method has been developed. Industry attempts to interpret the United States Food and Drug Administration's procedures under the Miller amendment as being an approval program. From our inquiries and our study of the matter, we find that this is not so. The United States Food and Drug Administration merely carries out its legal requirements under the amendment, judging, from facts presented by the private applicant, what would be considered a safe tolerance. This is based on the applicant's research work. Recently it was found that the addition of an organic phosphate to a food which contained another organic phosphate reduced the tolerance for both compounds manyfold. The Administration now requires cross checking of all four or five organic phosphates submitted. The question this Division raises is: Why shouldn't all of the chemical additives be cross checked; and who can say whether other chemical additives passing into the human system, besides the organic phosphates, may or may not catalize a much more toxic reaction, precipitating any one of a hundred organic failures? At best, the ingestion of normal natural foods poses difficulty for digestion and assimilation in many human beings.

Again, I reiterate that this is an extremely serious problem, and the most serious that faces this generation from a public health point of view. The Department, recognizing this, has passed a regulation forbidding the use of preservatives in food to be sold in this Commonwealth without the Department's approval. The addition of aureomycin and biphenyl to foods has been disapproved by the Department at this date. The use of ammonia and sodium orthophenylphenate to food has been approved. The approval of the orthophenylphenate compound has been on the basis that the food for which it has been approved be thoroughly washed so as to eliminate all but negligible traces of the compound.