# Public Health Reports

*Vol. 61* • NOVEMBER 15, 1946 • *No. 46*

**Printed With the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing**

## EDITORIAL

### HEALTH SERVICES FOR FEDERAL EMPLOYEES [1]

Passage of Public Law 658 by the Seventy-ninth Congress makes possible the establishment of a preventive medical program for Federal employees. Heads of departments and agencies of the Federal Government including Government-owned and -controlled corporations, after consulting with the United States Public Health Service and after consideration of its recommendations, may establish employee health programs for the purpose of promoting and maintaining the physical and mental health of the employees of the Federal Government.

The United States Public Health Service for many years has made studies of specific industrial and occupational hazards and has furnished professional advice upon request to private industry and to agencies of the Federal Government. Many industrial organizations and commercial establishments have found that employee health programs have paid dividends in increased efficiency and productivity. It is anticipated that a preventive medical program operated by the several Federal departments and agencies should prove of great value in helping employees to perform their assigned duties efficiently and economically.

"A Suggested Plan for a Preventive Medical Program in a Federal Employees' Health Service" has been formulated and is presented in detail in the following pages of Public Health Reports. This plan is subject to modification from time to time in accordance with the evolution of preventive medicine.

[1] From the Bureau of Medical Services.

# A SUGGESTED PLAN FOR A PREVENTIVE MEDICAL PROGRAM IN A FEDERAL EMPLOYEES' HEALTH SERVICE [1]

## FOREWORD

The essential elements believed to be desirable for a preventive medical program in a Federal employees' health service at this time are set forth.

It is hoped that the plan suggested will be of assistance in developing, establishing and operating employees' health services such as are consistent with the provisions of Public Law 658.

## I. PURPOSE

A Federal employees' health service program has two major objectives:

A. To serve the employee—the Federal employee (a taxpayer)—by assisting him to maintain optimal health while on the job.

B. To serve the employer—the Government (all taxpayers)—by increasing, or maintaining, production through the establishment and maintenance of methods and standards which make it possible for the employee to maintain optimal health in his total work environment.

The major objectives should be consistent with: (1) the function of the agency or department; (2) the Federal Government's responsibility as fixed by Public Law 658, Seventy-ninth Congress—hereafter referred to as the Act; (3) the Federal Government's responsibility as fixed by the Employees' Compensation Act of 1916 as amended; (4) the employee's relationship to his family physician and dentist; (5) the codes of ethics of the medical, dental and nursing professions.

## II. AUTHORIZATION

[PUBLIC LAW 658—79TH CONGRESS]

[CHAPTER 865—2D SESSION]

[H. R. 2716]

AN ACT

To provide for health programs for Government employees

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That, for the purpose of promoting and maintaining the physical and mental fitness of employees of the Federal Government, the heads of departments and agencies, including Government-owned and -controlled corpora-

[1] From the Office of Employees' Health, Bureau of Medical Services, United States Public Health Service.

tions, are authorized, within the limits of appropriations made available therefor, to establish, by contract or otherwise, health service programs which will provide health services for employees under their respective jurisdictions: *Provided*, That such health service programs shall be established only after consultation with the Public Health Service and consideration of its recommendations, and only in localities where there are a sufficient number of Federal employees to warrant the provision of such services, and shall be limited to (1) treatments of on-the-job illness and dental conditions requiring emergency attention; (2) preemployment and other examinations; (3) referral of employees to private physicians and dentists; and (4) preventive programs relating to health: *Provided further*, That the health program now being conducted by the Tennessee Valley Authority and by the Panama Canal and Panama Railroad Company shall not be affected by the provisions of this Act: *And provided further*, That such health programs as are now being conducted for other Federal employees may be continued until June 30, 1947. The Public Health Service, when requested to do so, shall review the health service programs being conducted by any department or agency under authority of this Act and shall submit appropriate comment and recommendations. Wherever the professional services of physicians are authorized to be utilized under this Act, the definition of "physician" contained in the Act of September 7, 1916, as amended (U. S. C., 1940 edition, title 5, sec. 790), shall be applicable.

Approved, August 8, 1946.

### III. INTERPRETATION OF THE ACT

A. In accordance with the authority contained in the Act of August 8, 1946, the heads of departments and agencies, including Government-owned and -controlled corporations, within the limits of appropriations made available therefor, may establish by contract or otherwise health services for employees under their respective jurisdictions according to any one, or combination, of the following:

1. Establish and operate their own health service programs;

2. Contract for the establishment and operation of their health service programs utilizing:

*a*) other competent Federal agencies or departments;

*b*) private or public organizations capable of rendering the services required;

3. Establish and operate in part their own health service programs and contract in part for the services authorized.

B. The scope of the health service programs as established in Public Law 658 is:

1. "Treatment of on-the-job illness and dental conditions requiring emergency attention;

2. "Preemployment and other examinations;

3. "Referal of employees to private physicians and dentists;

4. "Preventive programs relating to health."

IV. PROPOSED STANDARDS AND RECOMMENDATIONS

The Public Health Service recommends that:

A. Type of program, personnel needs, functional organization—

1. All employees' health service programs be preventive health programs.

2. The professional responsibility for the health service programs be vested in the physician in charge of the agency's employees' health service.

3. The physician in charge of the employees' health service program of a department or agency, including Government-owned and -controlled corporations, be directly responsible at the level of the principal administrative officer of the department or agency, including Government-owned and -controlled corporations.

The position taken by the Public Health Service at this time in regard to the placement of a Federal employees' health service in the functional organization of an agency or department is as follows:

(*a*) The department or agency head, because of the responsibility inherent in his position, has the right to place the health service at the level he deems proper in his own department or agency.

(*b*) The Public Health Service, as the result of its experience with industry, advises that the placement of the health service be at a high level, such as is occupied by the principal administrative officer in a department or agency.

(*c*) The Public Health Service does not intend to designate the placement of the health service under any specific official, whether that official be an administrative officer, a personnel officer, or a budget officer, because this is a prerogative of the head of the department or agency.

The Act places the administrative responsibility for the health service program in the head of the Government department or agency, including Government-owned and -controlled corporations.

4. The nurse in charge of a nursing service be administratively and professionally responsible to the chief physician of the agency, and collaborate with him in fulfilling the broad areas of the program. In agencies where there is no physician in charge of the employees' health service program, the nurse in charge of the nursing and health service be administratively responsible at the level of the principal administrative officer of the department, or agency, including Government-owned and -controlled corporations.

5. The professional personnel—physicians, dentists, nurses, and other professional personnel—operating in, and in relation to, the health service program be of high professional caliber and capabilities which comply with the professional standards established by the Civil Service Commission for professional personnel engaged in a preventive medical program. In instances where professional personnel are members of the commissioned corps of the Army, the

Navy, or the Public Health Service, or are those engaged in programs of the Veterans' Administration, professional standards be those established within each respective service organization herein named for personnel engaged in preventive medical programs within each respective service.

The number of physicians, dentists, nurses, and adjunctive specialists and supporting personnel as set forth below provides a flexible base from which to initiate services. With such a beginning, modification either by addition or subtraction may be made to suit factors in each specific location.

6. The number of physicians per unit of population be one physician for 4,000 to 6,000 employees.[2]

Factors to be considered in determining a more exact ratio of physicians to population include among others:

(a) distribution of employees geographically;
(b) shifts worked;
(c) extent of industrial hazards present;
(d) employee turnover;
(e) number of health examinations required;
(f) size of employee population;
(g) sex and age distribution of the employee group;
(h) type of work being done;
(i) degree of group isolation from other medical and dental services;
(j) degree of accessibility of the health service to the employee;
(k) degree of employees' understanding of the purpose and availability of the health services.

7. The number of dentists per unit of population be determined following a review and evaluation of need in relation to a preventive dental program in accord with the Act.

The factors listed above concerning the ratio of physicians per unit of population are generally applicable to the ratio of dentists per unit of population.

8. The number of nurses per unit of population be that recommended for industry, namely:[3]

1 nurse for up to 300 employees;
3 nurses for the first 1,000 employees;
1 nurse for each additional 1,000 employees, up to 5,000 employees;
1 nurse for each further additional 2,000 employees.

The factors which influence the number of nurses required per unit of population are essentially the same as those which influence the number of physicians required. Furthermore, when a preventive

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[2] This ratio is an estimate based on existing practices in industry, with consideration for the real difference existing between the type of preventive medical program authorized by Public Law 658 and industrial medical programs. The ratio is based on the potential work load of the physician in preventive medical programs.

[3] Report of the Committee to Study the Duties of Nurses in Industry of the Public Health Nursing Section of the American Public Health Association, PUBLIC HEALTH NURSING, July 1943, p. 394.

medical program is to evolve from existing emergency room first-aid services, it is essential that a gradual infiltration of appropriately qualified public health nurses be effected at all levels in the functional organization of the respective Federal employees' health service. Infiltration may, and in many instances should, be accomplished by two processes: First, by adding an appropriate number of public health nurses to the program in the beginning, for the purpose of effecting supervisory guidance and instruction of incumbent staff, and for the purpose of effectuating the desired evolution; and second, by filling all vacancies as they occur in the natural course of events by appropriately qualified public health nurses in order to sustain the desired evolution.

It is hoped provision may be made whereby incumbent nurse personnel in emergency room first-aid services are given the opportunity and encouraged to secure appropriate professional education and appropriate professional experience whereby they may qualify as public health nurses.

9. The number of technicians, stenographers, and clerical personnel per unit of population be determined upon the basis of the potential treatment load of the professional personnel of the health unit, and upon the degree of accessibility of available Federal and local facilities for medical technical work for each agency.

10. In special instances where circumstances warrant, advisers in the fields of Health Education, Nutrition Education, Sanitary Engineering, and other adjunctive services be added to the basic professional staff of the individual employee health service.

11. Health service programs now (August 8, 1946) being conducted may be continued until June 30, 1947. After June 30, 1947, in those departments and agencies including Government-owned and -controlled corporations where the health service program plans have not been completed and appropriations secured, "temporary interim programs" with a physician in charge, or with a registered nurse in charge be continued until the head of the department or agency can complete the necessary plans, obtain approval, and secure appropriations for a permanent health service program.

Congressional authority in a department's or agency's appropriation act will be necessary to continue the operation of "temporary interim programs" after June 30, 1947. The language of the respective appropriation acts should specifically identify the type of health service to be conducted by the department or agency as being either (a) a temporary interim health service, or (b) a preventive medical service.

12. "Temporary" health service programs be established on a nursing level until such time as plans are approved, and appropria-

tions secured for permanent health service programs under the direction of a qualified physician. Looking toward the development of programs authorized by the Act, and under the existing authority for the employing of registered nurses, heads of departments and agencies, including Government-owned and -controlled corporations, employ nurses who are qualified in accordance with Civil Service Commission standards for nurse personnel in preventive medical programs. Nurses of the commissioned corps of the Army, the Navy, or the Public Health Service and nurses employed by the Veterans' Administration assigned to Federal employees' health services should meet the standards set by the respective above-named Services for nurse personnel in preventive medical programs.

13. The space made available for health service units be adequate in all respects for conducting an effective health service program.

14. The supplies and equipment provided be sufficient for the existing demands.

15. The records in all health service programs be properly maintained on prescribed standard forms. Individual case records of medical, dental, and nursing services be retained in the health unit and be regarded as confidential material. Interpretive reports be available for official usage.

16. The reporting procedures in all health service programs conform to prescribed standard requirements in order that valid statistical comparisons may be made.

17. Nurses be provided with professionally acceptable written standing orders.

18. The health unit be the focal point concerning the health of the employee and the related employee health matters of the department or agency. All activities relating to employee health matters be centralized in the health unit's professional personnel. All health counseling be conducted by the appropriate professional personnel of the health unit.

19. Illness and injury incurred in performance of duty or proximately caused by employment are properly the responsibility of the Bureau of Employees' Compensation, and the prescribed regulations pertaining thereto be followed inasmuch as Public Law 658 is not interpreted as superseding the Compensation Act of September 7, 1916, amended.

20. The health program for the individual department or agency and Government-owned and -controlled corporation be considered as one over-all health service for the total employee population, and the health service be financed at the departmental level for the total department or agency and for its constituent subdivisions, including

individual bureaus, divisions and constituent administrative units thereof.

21. An adequate maid and janitor service be provided in relation to the needs of the health service unit.

22. Each department and agency utilize to the utmost existing available Federal and local facilities, in relation to the operation of the various phases of the health service programs, for consultation and for health educational purposes.

23. In instances where employees of one agency are stationed in a building in which another agency operates a health service, and in instances where employees of an agency are located within easy access of another agency's health service, effort be made by the agencies concerned to effect a contract whereby the existing health services may be utilized by the agencies concerned. The resources of the Bureau of the Budget and the United States Public Health Service be utilized as needed in effecting this arrangement. In order to facilitate maximum utilization of Federal employees' health services as proposed above, the Public Health Service, acting upon the request of the Bureau of the Budget, shall establish and maintain a currently active, central registry of all health services operating in Federal departments and agencies including Government-owned and -controlled corporations. This registry shall be used for the purpose of effecting coordination, and for providing the Bureau of the Budget with information and identification data.

24. Where agencies are not large enough to justify health service programs of their own, cooperative arrangements be worked out with other Federal agencies.

25. Health service programs be established in the metropolitan area of Washington, D. C., first. At a later date a program for the field be developed.

26. Plans be effectuated whereby appropriate health service will be provided to those groups of employees for whom it is not feasible to provide complete service as herein outlined, due to the factor of isolation and/or the small size of the group.

B. The health program and scope of service—

The basic health program comprising medical, dental and nursing service shall include the following:

1. Promotion of the individual employee's optimal health.
2. Diagnostic and advisory services.
3. Treatment, medical and dental, as defined by the Act.
4. Prevention of disease.
5. Analysis of statistics and services.
6. Maintenance of all medical records of employees as confidential medical information.

7. Interpretation of findings to personnel and management officials and collaboration with personnel officials in planning, initiating and carrying out various over-all aspects of the program.

C. The component parts of each specific phase of the health program be as outlined below—

1. Promotion of the individual employee's health. This be accomplished through the following:

*a*) Health examinations which include:

(1) preplacement examinations:
  (a) original;
  (b) reassignment;
(2) periodic examinations as indicated;
(3) regular annual health examination to include determination of current medical findings (somatic and psychic); current dental findings; chest X-ray; urine analysis and other laboratory work as indicated;
(4) examination following sickness absenteeism as indicated;
(5) examinations upon the request made by the employee himself, his superior officer, or the nurse;
(6) examination of the physically handicapped, followed by medical advice for the purpose of securing proper job placement;
(7) examinations to determine:
  (a) fitness for continuing assignment;
  (b) need for separation and/or health status at time of separation;
  (c) need for change of duty;
  (d) need for retirement and/or health status at time of retirement;
  (e) presence of infectious or communicable disease;
  (f) presence of conditions of chronic and/or of serious nature;
  (g) presence of mental illness and/or acute emotional imbalance;
  (h) degree of progress occurring in cases requiring rehabilitation;
(8) periodic examination of foreign service personnel following service abroad, with special reference to infectious diseases; recommending appropriate measures and/or determining fitness for continuing the assignment; obtaining from appropriate sources information concerning specific health hazards about to be encountered in service outside the country and recommending precautions to be taken.

*b*) The preemployment health examination be used as the foundation upon which to develop the health record and future health service for the individual employee within the agency.

*c*) The professional personnel of the health unit consult with the employee regarding the recorded findings at the time of the health examination in accordance with the physician's directions; health education and guidance, together with periodic follow-up, be carried out by the physician and the nurse on an individual and personalized basis to facilitate effective functioning of the individual, and of the group.

*d*) The preemployment health record contain the following:

(1) social and occupational history;
(2) medical and dental history;
(3) current dental findings;
(4) chest X-ray reports;
(5) current medical findings (somatic and psychic);
(6) urinalysis report;
(7) blood serology report;
(8) hematology report (when indicated);
(9) an expression of the physician's opinion regarding the employee's probable capacity for making a satisfactory adjustment to the proposed job, and/or to other employment.

*e*) The practice be initiated and continued whereby the medical records are regarded as confidential medical information and an interpretation of findings is given to personnel and management officials when and as desirable for more effective utilization of manpower as related to: the employees' adjustment to the job; job placement; job adjustment; and maintenance of individual and group health.

*f*) Sustained collaboration be maintained between the physician, industrial hygiene personnel and the safety engineer, in the study of the total physical work environment of each group of workers for the following purposes:

(1) to determine the nature and extent of hazards which are present, or believed to be imminent;
(2) to plan, initiate, and secure appropriate action for correcting any hazardous situation.

*g*) The physician be charged with an industrial physician's share of responsibility for detecting the presence of specific occupational hazards, and the presence of tangible and intangible factors within the work environment which are capable of having a deleterious effect upon the health of the worker and his level of productivity.

*h*) The physician be charged with an industrial physician's share of responsibility for discovering needs, recommending specific measures, and jointly initiating appropriate action for correcting conditions requiring attention.

*i*) The physician be charged with the full responsibility of a medical specialist in maintaining sustained collaboration and cooperation between the health unit and other appropriate personnel of the agency or department, and in providing the employee with an optimal work environment.

*j*) The physician and professional staff of the health unit be charged with the responsibility of maintaining a sustained health-education program for the employee population, and separate groups thereof. Appropriate health-education activities be planned, initiated, and carried out by the medical, dental, nursing, and other appropriate professional personnel of the health unit.

*k*) An industrial mental hygiene program be promoted which is directed at better job adjustment for employees and better placement of employees, concerned with the fitting together of the emotional demands of the job and the emotional assets of the employee. This should be done through a program of education and supervision, at all levels in the functional organization of the agency.

Such programs be carried out with the collaboration and cooperation of the personnel staff.

*l*) Programs of case finding, communicable disease control, special campaigns such as mass chest X-ray examinations, and similar activities be planned, initiated and carried out by the professional staff of the health unit for the employee population of the agency.

## 2. Diagnostic and advisory service include:

*a*) Professional evaluation of the employee's symptoms; determination of the true nature of his problem; determination of the significance of his problem in relation to:

(1) the employee;
(2) the employee group;
(3) production levels;
(4) the community;

*b*) Guidance of the employee into a fuller understanding of:

(1) his problem;
(2) ways of dealing with his problem;
(3) resources available to him for his use in dealing with his problem;
(4) appropriate steps to be taken in dealing with his problem.

*c*) Referral of the employee to physicians and dentists of the employee's own selection for treatment of illness, other than on-the-job illness and dental condition requiring emergency attention.

*d*) Utilization by the agency physician of the consultation services of the United States Public Health Service and other Federal and local resources, and effective exchange of pertinent information between the agency's employees' health service and the resources mentioned above.

*e*) Appropriate interpretation of the employee's problem to the superior officer of the employee, and to appropriate personnel officers within the agency who share responsibility for all, or part, of the situation.

3. Medical, dental, and nursing treatment provided to employees include the following:

*a*) Immediate care of illness and injury incurred in the performance of duty and/or proximately caused by the employment.

*b*) Subsequent care of such conditions as are authorized by the Bureau of Employees' Compensation under the direction of properly designated authorities.

*c*) Care of on-the-job illnesses and dental conditions of noncompensable nature which require emergency attention.

*d*) Emergency care of the employee who is suffering from a serious nonservice-connected illness and/or injury; and prompt arrangement for further medical care for the employee by his private physician and/or dentist, or by a hospital.

*e*) Special treatments to the individual employee upon the specific request of his local private physician or dentist. The medication and biologicals needed for his treatment to be acquired by the employee at his own expense and supplied by him to the health unit.

*f*) Professional consultation and health instruction by the physician, the dentist, the nurse, and other appropriate professional personnel on matters relating to the individual's maintenance of optimal health and well-being.

*g*) Dental treatment include:

(1) immediate care of illness and injury incurred in the performance of duty and/or proximately caused by the employment;
(2) subsequent care of such conditions as are authorized by, and under the direction of, authorities designated by the Bureau of Employees' Compensation;
(3) preemployment and periodic oral examination and diagnosis;
(4) emergency dental treatment necessary for the relief of pain and infection;
(5) adequate recording of findings and recommendations;
(6) referral of the employee for further remedial and restorative care to the private dentist of the employee's selection;
(7) dental health education.

NOTE.—The details concerning the scope and type of dental service to be recommended by the Public Health Service are being developed, and will be presented at a later date.

*h*) The function of the nursing service include treatment, health counseling, health education, and liaison, as well as administration, and operation of

the individual and/or group of health units. The nurse's responsibility will include performing such services as the following:

(1) interviewing;
(2) health counseling;
(3) health instruction;
(4) case-finding and follow-up on an individual basis;
(5) treatment of on-the-job illness and dental condition requiring emergency attention according to standing orders, or other appropriate medical or dental authorization;
(6) collaboration and participation in planning, initiating and carrying out over-all health education programs, and programs of case-finding on a mass level;
(7) carrying out under the direction of the supervising physician specific phases of research relating to such as the following:
(a) program planning to improve methods;
(b) disease prevention;
(c) reduction of absenteeism;
(8) maintaining approved systems of records and reports;
(9) compiling records and reports;
(10) cooperating with the physician and/or the dentist during his examination, and/or treatment, of the individual employee;
(11) appraisal and referral of cases to appropriate available resources;
(12) acting as liaison between the employee and these resources;
(13) acting as interpreter, and/or liaison, between the employee and his physician, and/or his dentist; between the agency physician and the employee; between the agency physician and appropriate personnel at various levels in the functional organization of the agency; between the agency physician and personnel of the community resources; and in instances where no physician is in charge of the agency health service, between the total health service and the personnel at all levels in the functional organization of the agency;
(14) maintaining a professionally correct visiting nurse service program, either as a part of the health unit service or on a contract basis with appropriate available resources, Federal, State, or local.

4. Analysis of statistics and services be made for the purpose of:

*a*) Utilizing the preemployment health examination and health records as indices from which to plan and initiate appropriate health measures and health education activities.

*b*) Utilizing reports of illness and injury incurred in performance of duty as a basis for initiating appropriate collaboration between the health service and the service of the safety engineer in effecting changes in the environment, and assisting the safety engineer in securing specific and appropriate accident-control and safety-promotion measures.

*c*) Securing close approximation and correlation between the services of the health unit, and the services of the personnel office.

*d*) Computing accurate cost analyses.

D. Appropriate quarters and facilities be provided by the agency to enable the employees' health service program to fulfill its function:—

1. Each health unit (and substation thereof) be so equipped and so arranged as to:

*a*) Promote effective functioning of the individual unit; expedite the flow of work through the unit, and eliminate unnecessary detention of the employee who comes to the unit for health service; and provide a professionally correct environment.

*b*) Conserve the time and energy of the employee, and that of the personnel of the health unit.

*c*) Provide maximum privacy for every employee during examination, treatment, and interview by the professional personnel of the health unit.

*d*) Provide an adequate reception and waiting room area.

*e*) Provide a suitable office for each physician, with equipment to include the following basic items:

1 examination table;
1 instrument cabinet;
1 treatment table for holding equipment which is being used by the physician in examining and/or treating the employee;
1 desk;
2 chairs;
1 mirror;
appropriate professional instruments and equipment; a curtain, swinging from overhead supports, to screen the examination table and to provide a dressing room for the employee prior to and following examination and/or treatment;
1 water-toilet and lavatory;
1 coat closet.

*f*) Provide suitable office and work space for each dentist which is adequately equipped to fulfill the functions of the dentist as set forth by the Act.

Details concerning type and quantity of dental equipment to be recommended by the Public Health Service are being worked out and will be presented at a later date.

*g*) Provide suitable treatment rooms, fully and appropriately equipped for use by the nurse while treating and/or interviewing the employee. Each treatment room be provided with a lavatory fixture with hot and cold running water, treadle controlled, and also a separate lavatory fixture for use by the employee when receiving oral and throat treatment, such as mouthwashes, gargles, and throat irrigations; or into which other contaminated solutions may be discarded, such as solutions from hand soaks, etc. (Having soundproof treatment rooms is essential so that the employee may be provided with the opportunity to discuss his problems of a more intimate nature while he is being treated for minor problems, and/or problems of less intimate nature.)

*h*) Provide at least one treatment room in excess of the number of nurses to be employed in any one unit (this is essential to provide space for treating employees who require soaks and packs, but who need not retain a nurse in constant attention with them.)

*i*) If laboratory services are required within the agency's health unit, provide a separate appropriately equipped unit or room to serve as a laboratory unit. This unit be so designed and so situated that the operator will be screened from view while working in the laboratory.

The problem of determining what is the most desirable plan for providing laboratory and X-ray service as a part of the employees' health service of the individual department, agency, or Government-owned and -controlled corporation is a problem which is unique for each individual and each specific location and should be determined with reference to the degree of availability of other appropriate facilities (Federal, State, and local), relative cost in dollars and cents, in employee time and energy, and in the end results to be accomplished.

*j*) Provide a communal work space or utility room immediately adjacent to the treatment rooms. This utility room space be equipped with:

(1) a work counter;
(2) running water (hot and cold) and sink and drainboards (treadle-control faucets);

(3) sufficient cabinet space to accommodate communal equipment and stock supplies;

(4) desk space for the staff nurses at which to write records and compile reports;

(5) file cabinets for filing case records adjacent to the nurse's desk. (Case records should be in close proximity to the treatment rooms and easily accessible to the nurse so that she may review the previous entries on the employee's case record before launching into treatment of his current problem. This is essential inasmuch as groups of symptoms are significant.)

*k*) Provide the equivalent of two comfortable rest rooms—one for male employees; one for female employees. Each room be equipped with an adequate number of beds.

*l*) Provide two complete toilet units—one for male, one for female, employees.

*m*) Provide adequate space to accommodate the required number of clerical workers.

*n*) Provide necessary storage space for equipment and supplies; and provide enough space for an adequate number of file cabinets.

*o*) Provide a soundproof office for the chief nurse, of size sufficient to permit its use as a staff-conference room.

*p*) Provide adequate office space for all other professional personnel who shall be required to hold conferences, or prepare written material, e. g. the assistant chief nurse, the visiting nurse, etc.

*q*) Provide a nurses' dressing and locker room equipped with an adequate number of lockers, chairs, dressing tables, mirrors, and a complete toilet and lavatory unit (lockers to be of sufficient size to permit the acceptance of heavy street clothes).

*r*) All health units be provided with standard "Health Unit" signs which are easily discernible and legible at a distance from every approach to the unit.

*s*) Each health unit be equipped with a drinking fountain.

2. In selecting the location of health units the following features be taken into account:

*a*) The health unit be centrally located, preferably on the first floor, near an exit which can be reached easily by automobile. If the unit is located above the ground floor, it be within easy access of elevators.

*b*) The unit be located in an area free from vibration and noise.

*c*) The unit be situated so as to permit expansion of facilities if and as the need for expansion occurs.

*d*) The space allocated for the health unit be compact and permit easy flow of work to eliminate bottlenecks and back-tracking.

*e*) The unit be well lighted and have controlled ventilation and temperature.

3. The pervading tone and quality of the total employees' health service be that created by the influence of high professional standards and a genuine interest in and respect for the personality of the individual employee.

# PREPARATION OF MUMPS VACCINES AND IMMUNIZATION OF MONKEYS AGAINST EXPERIMENTAL MUMPS INFECTION[1]

By KARL HABEL, *Surgeon, United States Public Health Service*

The importance of mumps in military populations has been emphasized by many observers (*1*, *2*). One solution of the problem of the spread of this disease in training camps would seem to be the detection of susceptible individuals and their immunization with a mumps vaccine. Enders et al. (*3*) have supplied a means of determining susceptibility by the use of a skin test. A source of antigen for skin testing and for possible vaccine production has been made available by the cultivation of the mumps virus in the developing chick embryo as carried out in this laboratory (*4*).

## Methods and Materials

### *Source of Antigens*

Infected allantoic fluid harvested in passage of the allantoic-sac substrain of egg virus, and infected yolk sacs from the yolk-sac substrain of the same virus (*4*) have been used as the source of virus in all our vaccine-production experiments. These antigens were kept frozen at −70° C. in sealed ampules until ready for use. Mumps-infected parotid glands were used as antigens in some of the complement-fixation tests.

### *Technique of Complement Fixation*

The technique employed throughout these experiments was similar to that previously described (*4*). Antigen titrations were made against a pool of serums from monkeys in the convalescent stage of mumps, diluted to contain 4 units of complement-fixing antibody per 0.2 cc. of serum. Serum titrations were made against either infected yolk-sac antigen or infected-monkey-parotid-gland antigen diluted to contain four complement-fixing antigen units per 0.2 cc. An acute and a convalescent monkey serum was included in each test, and all serum samples from each monkey were run in the same test. At first, serums from monkeys immunized with egg-virus vaccines were tested against parotid virus; however, it was found that the monkeys did not develop any demonstrable antibodies against yolk-sac tissue as such, and subsequent tests were made with infected yolk sac as antigen.

All monkey serums were inactivated at 62.5° C. for 20 minutes.

End points as recorded are the highest original dilution of serum in which complete (++++) fixation occurred.

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[1] From the Division of Infectious Diseases, National Institute of Health.

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***Method of Virus Neutralization***

A quantitative method of titering the amount of virus-neutralizing antibody in serum samples was developed, the chick embryo being used as the test animal. Undiluted serum and dilutions of 1:2, 1:4, 1:10, 1:25, 1:50, 1:100, or higher by twofold differences were mixed with equal parts of an egg-virus suspension. This mixture was incubated at 37° C. for 1 hour, then kept cold while being inoculated into eggs by the homologous route for the virus substrain used. The egg material was harvested from these eggs after incubation for the usual period for the virus substrain used and was then tested for virus multiplication by an antigen titration against known immune serum in the complement-fixation test. Thus, if the original serum dilution had neutralized the virus mixture, no virus would grow in inoculated eggs and no antigen in the harvested egg would be demonstrated by complement fixation. In the first two vaccine experiments this virus-neutralization test was run against amniotic-fluid virus, and serum-virus mixtures were inoculated into the amniotic sac of the eggs. However, this procedure involved a cumbersome technique, and subsequently the routine procedure involved the use of allantoic-fluid virus diluted to contain 10 minimum infectious doses for the egg, the virus-serum mixtures being inoculated into the allantoic sac.

In all tests, an undiluted serum from a monkey in the acute stage of mumps and a serum diluted 1:10 from a monkey in the convalescent stage were included as controls.

***Test of Immunity in Vaccinated Monkeys***

All monkeys were bled for serum before immunization. Ten days after the last dose of vaccine administered to any of the monkeys on a given experiment, they were again bled and given a test dose of virus. Twenty-one days after the test dose a third serum sample was collected. Most of the serums were tested for titer of both complement-fixing and virus-neutralizing antibodies.

The test dose consisted of dilutions of parotid virus obtained from the thirty-seventh and thirty-eighth passages of a strain of virus carried exclusively in monkeys. Two cubic centimeters of virus dilution was injected directly into each Stenson's duct. The monkeys were checked daily during 14 days for fever and parotid swelling. In the tables, fever is denoted as + if 40° C. on 1 day, ++ if over 40° C. on 1 day, +++ if over 40° C. for 2 days, and ++++ if over 40° C. for 3 days or more. Swelling indicated by ± indicates a gland barely palpable deep under the angle of the jaw, + means slight, ++ moderate, +++ marked palpable swelling, and ++++ marked swelling with pitting edema.

With the exception of vaccine experiment No. 1, all monkeys were tested with dilutions of the same frozen virus. Because of the

short incubation period of mumps in monkeys (5 to 7 days) as compared with humans (18 days) and the direct method of inoculation into the parotid duct, it seemed important to know something of the quantity of virus being inoculated in the test dose. The frozen virus therefore was titered in monkeys; table 1 shows that monkeys could be infected with the virus diluted out at least as far as 1:50,000, so that in all the vaccine experiments the monkeys were being tested with at least 10 to 100 M. I. D.

TABLE 1.—*Titer of test dose* [1] *virus used in vaccine experiments*

| Dilution | Monkey | Reaction | | Complement-fixation titer | |
|---|---|---|---|---|---|
| | | Fever | Swelling | Before | After |
| 1:5 | 393 | +++ | +++ | | |
| | 413 | 0 | ++ | 0 | 1:16 |
| 1:500 | 395 | +++ | ++ | 0 | 1:16 |
| | 408 | ++ | + | 0 | 1:16 |
| | 353 | ++ | ++ | 0 | 1:16 |
| | 324 | + | ++ | 0 | 1:32 |
| 1:5,000 | A40 | 0 | ++ | 1:2 | 1:64 |
| | 371 | 0 | + | 0 | 1:64 |
| | 411 | + | ++ | 0 | 1:16 |
| | 424 | 0 | ++ | | |
| 1:50,000 | 249 | 0 | ++ | 0 | 1:16 |
| | 335 | 0 | + | 0 | 1:128 |

[1] 2 cc. of virus dilution inoculated into each Stenson's duct.

***Purification and Concentration of Virus***

*Virus titer.*—As earlier experiments demonstrated that the yolk-sac virus titered to $10^{-6}$ in eggs and allantoic-sac virus (*4*) to $10^{-5}$, these two egg substrains were taken as the source of antigen for the preparation of vaccines.

*Ether extraction.*—Preliminary experiments showed that in ether extraction of yolk-sac virus the relatively purified aqueous phase contained the same titer of antigen by complement-fixation titration as the original material.

*Precipitation of virus by pH change.*—Antigen titrations of yolk-sac virus after being brought to various pH levels and the comparative amounts of antigen in the resulting precipitates showed that a pH of 6.0 or lower apparently destroyed the antigen and that pH 6.2 was the level at which the greatest precipitate was formed without destruction of the antigen.

*Precipitation of virus on the urates of infected allantoic fluid.*—If infected allantoic fluid is centrifuged when harvested it is a clear solution. However, when frozen and thawed the dissolved urates precipitate out, and part of the virus adheres to this precipitate. In preliminary experiments the precipitates were brought back to original volume before being run in a complement-fixation titration. Both

with allantoic fluid alone and mixed with yolk sac most of the virus present adhered to the urate precipitate.

### *Inactivation of Virus*

It was shown previously (*4*) that mumps virus in yolk-sac suspensions was killed by exposure to 1½ volumes of ether at 4° C. for 30 minutes, and also that as little as 0.2 second's exposure to ultraviolet light [2] would inactivate the virus. Both these methods of killing virus, however, preserved the antigen so that complement-fixation titers remained unchanged.

### *Use of Adjuvants in Vaccines*

In order to slow up the absorption of the antigen in the vaccine, the antigen in some experiments was emulsified with 4 percent beeswax made up in either mineral oil or peanut oil, following the directions of Romansky (*5*) who used this technique for slowing the rate of absorption of penicillin.

### *Preparation and Testing of Vaccines*

*Experiment 1.*—Vaccine No. 1 was prepared from a 10-percent whole emulsion of yolk-sac virus in saline inactivated by ultraviolet light. The original yolk sac had a complement-fixation titer of 1:64. Two monkeys received three doses of 2 cc. each given 1 week apart by the subcutaneous route. As shown in table 2, when tested with a heavy dose of virus one monkey developed moderate parotid swelling and the other was protected, whereas the two control monkeys showed marked swelling. As a result of vaccination, the monkeys developed titers of 1:32 and 1:8 by complement fixation, and their undiluted serum neutralized virus. Three weeks after the test dose of virus the complement-fixation titers reached 1:128 and virus neutralization took place with serum diluted to 1:100.

*Experiment 2.*—Vaccine No. 2 was prepared from a 10-percent yolk-sac suspension in saline. The original complement-fixation titer was 1:8. It was extracted with 1½ volumes of anhydrous ether for 30 minutes at 4° C. The ether was removed by suction from the aqueous phase and the latter was given to two monkeys in three 2-cc. doses subcutaneously at intervals of 1 week.

Vaccine No. 3 was a 10-percent suspension of the same yolk sac as that used for vaccine No. 2 but infected allantoic fluid (complement-fixation titer 1:2) was used as the diluent instead of saline. This suspension was ether-extracted, and the aqueous phase was injected into two monkeys on the same dosage schedule.

Table 2 shows that following challenge virus all the monkeys developed a parotitis except one of the two receiving vaccine No. 3. None of the monkeys had any complement-fixing antibody as a result of vaccination. The serums of both monkeys receiving vaccine No. 2 neutralized virus when undiluted, that of the unprotected monkey receiving vaccine No. 3 had no neutralizing antibody, while that of the protected monkey neutralized virus at a 1:10 dilution. Both complement-fixing and virus-neutralizing titers increased after the test dose.

*Experiment 3.*—Vaccine No. 4 was prepared from undiluted allantoic fluid inactivated by ultraviolet irradiation. The same allantoic fluid (complement-fixation titer of 1:2) was used to make a 10-percent suspension of yolk sac (titer of 1:16); it was angle-centrifuged and the supernatant irradiated to make vaccine

[2] Oppenheimer-Levinson type of ultraviolet lamp and exposure chamber.

No. 5. Part of this same supernatant was frozen and thawed and then angle-centrifuged, the urate precipitate made back to one-tenth the original volume, and then irradiated to make vaccine No. 6. Vaccine No. 7 was made from another part of the supernatant of yolk-sac-in-allantoic-fluid, precipitated at pH 6.2, and the precipitate made back to one-tenth the original volume and then irradiated. (chart 1A).

TABLE 2.—*Monkeys immunized with mumps vaccines challenged with mumps virus inoculated into Stenson's ducts*

Experiment 1

| Vaccine | Doses (2 cc.) | Monkey | Test dose [1] | | | Complement-fixation titers | | | Serum-neutralization titers | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Dilution | Fever | Swelling | Before vaccine | Before test | After test | Before vaccine | Before test | After test |
| No. 1. 10-percent whole irradiated yolk sac. | 3 at 1-week intervals. | 420 | 1:5 | + | ± | 0 | 1:32 | 1:128 | 0 | 1:1 | 1:100 |
| | do | 394 | 1:5 | ++ | ++ | 0 | 1:8 | 1:128 | 0 | 1:1 | 1:100 |
| Controls | | 309 | 1:5 | 0 | +++ | ----- | 0 | 1:16 | ----- | ----- | ----- |
| | | 407 | 1:5 | +++ | ++++ | ----- | ----- | ----- | ----- | ----- | ----- |

Experiment 2

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 2. 10-percent yolk sac supernatant ether extract. | 3 at 1 week intervals. | 352 | 1:500 | + | ++ | 0 | 0 | 1:32 | 0 | 1:1 | ----- |
| | do | 354 | 1:500 | + | +++ | 0 | 0 | 1:128 | 0 | 1:1 | ----- |
| No. 3. 10-percent yolk sac in allantoic fluid ether extract. | do | 343 | 1:500 | 0 | ++ | 0 | 0 | 1:32 | 0 | 0 | 1:50 |
| | do | 361 | 1:500 | 0 | ± | 0 | 0 | 1:64 | 0 | 1:10 | 1:50 |
| Controls | | 300 | 1:500 | 0 | ++ | ----- | 0 | 1:64 | ----- | 0 | 1:25 |
| | | 291 | 1:500 | 0 | ++ | ----- | 0 | 1:256 | ----- | 0 | 1:25 |
| Immunes | | 309 | 1:500 | 0 | 0 | ----- | 1:32 | 1:128 | ----- | 1:10 | 1:100 |
| | | 413 | 1:500 | 0 | 0 | ----- | 1:16 | 1:256 | ----- | 1:10 | 1:100 |

Experiment 3

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. 4. Allantoic fluid, irradiated. | 3 at 1-week intervals. | 346 | 1:5,000 | 0 | 0 | 0 | 0 | 1:256 | 0 | 1:1 | 1:50 |
| No. 5. Yolk sac in allantoic fluid, irradiated. | do | 357 | 1:5,000 | 0 | 0 | 0 | ----- | 1:64 | 0 | 1:1 | 1:50 |
| | do | 365 | 1:5,000 | ++ | ± | 0 | 0 | 1:64 | 0 | 0 | 1:25 |
| No. 6. Yolk sac in allantoic fluid urate precipitate, irradiated. | do | 342 | 1:5,000 | ++ | 0 | 1:2 | 1:2 | 1:256 | 0 | 0 | 1:200+ |
| | do | 360 | 1:5,000 | + | + | 0 | 0 | 1:256 | 0 | 0 | 1:50 |
| No. 7. Yolk sac in allantoic fluid pH 6.2 precipitate, irradiated. | do | 339 | 1:5,000 | + | 0 | 0 | 1:2 | 1:128 | 0 | 1:1 | 1:50 |
| | | 348 | 1:5,000 | ++ | + | 0 | 0 | 1:256 | 0 | 1:4 | 1:50 |
| No. 8. Yolk sac in allantoic fluid ether extract. | do | 384 | 1:5,000 | 0 | + | 0 | 1:8 | 1:64 | 1:1+ | 1:100 | 1:200+ |
| No. 9. Yolk sac in allantoic fluid pH 6.2 precipitate in 4-percent beeswax mineral oil ether extract. | 1 at 1-week intervals. | 355 | 1:5,000 | ++ | ++ | 0 | 0 | 1:16 | 0 | 1:4 | 1:400 |
| | do | 359 | 1:5,000 | 0 | ++ | 0 | 0 | 1:32 | 0 | 1:4 | 1:200 |
| Controls | | 324 | 1:5,000 | + | ++ | ----- | 0 | 1:32 | ----- | 0 | 1:25 |
| | | 353 | 1:5,000 | ++ | ++ | ----- | 0 | 1:16 | ----- | 0 | 1:10 |
| Immunes | | 291 | 1:5,000 | + | ± | ----- | 1:256 | 1:256 | ----- | 1:100 | 1:50 [2] |
| | | 300 | 1:5,000 | 0 | 0 | ----- | 1:64 | 1:256 | ----- | 1:100 | 1:25 [2] |

[1] 2 cc. virus dilution inoculated into each Stenson's duct.
[2] Serums tested after prolonged storage at 4° C.

TABLE 2.—*Monkeys immunized with mumps vaccines challenged with mumps virus inoculated into Stenson's ducts*—Continued

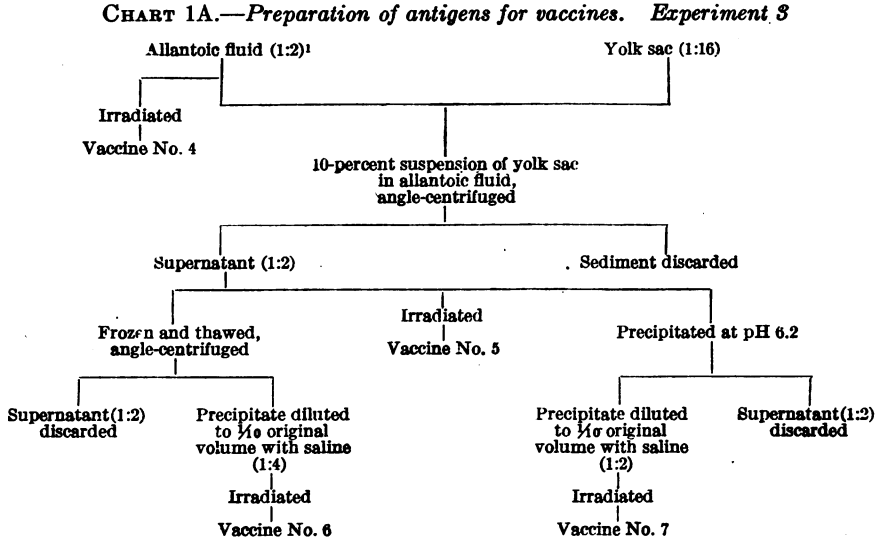
Experiment 4

| Vaccine | Doses (2 cc.) | Monkey | Test dose [1] | | | Complement-fixation titers | | | Serum neutralization titers | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Dilution | Fever | Swelling | Before vaccine | Before test | After test | Before vaccine | Before test | After test |
| No. 10. Yolk sac and allantoic fluid precipitate in oil, irradiated. | 1 at 1-week intervals. | 343 | 1:5,000 | + | 0 | 0 | 1:128 | 1:512 | 1:25 | 1:200 | 1:400 |
| | do | A 57 | 1:5,000 | + | 0 | 0 | 1:8 | 1:512 | 0 | 1:10 | 1:800 |
| | 2 at 3-week intervals. | A 42 | 1:5,000 | + | ± | 1:2 | 1:64 | 1:128 | 0 | 1:50 | 1:400 |
| | do | A 44 | 1:5,000 | ++ | 0 | 0 | 1:128 | 1:512 | 0 | 1:10 | 1:400 |
| | do | A 61 | 1:5,000 | 0 | ++ | 0 | 1:32 | 1:128 | 0 | 1:25 | 1:200 |
| No. 11. Yolk sac and allantoic fluid precipitate in saline, irradiated. | do | A 58 | 1:5,000 | 0 | ± | 0 | 1:64 | 1:64 | 0 | 1:4 | 1:200 |
| | do | A 59 | 1:5,000 | 0 | + | 0 | 1:16 | 1:32 | 0 | 1:25 | 1:100 |
| Controls | | A 52 | 1:5,000 | 0 | + | ----- | 0 | 1:32 | ----- | 1:1 | 1:25 |
| | | A 54 | 1:5,000 | 0 | ++ | ----- | 0 | 1:32 | ----- | 1:1 | 1:100 |

[1] 2 cc. virus dilution inoculated into each Stenton's duct.

Vaccines No. 8 and No. 9 were made from a 10-percent suspension of yolk sac (titer 1:8) in allantoic fluid (titer 1:2). This suspension was extracted for 30 minutes at 4° C. with 1½ volumes of anhydrous ether and the ether was removed from the aqueous phase by suction to make vaccine No. 8. The remaining aqueous phase was then precipitated at pH 6.2, the precipitate being brought back to one-tenth the original volume. Vaccine No. 9 was made by diluting this precipitate with an equal amount of 4-percent beeswax in mineral oil (chart 1B).

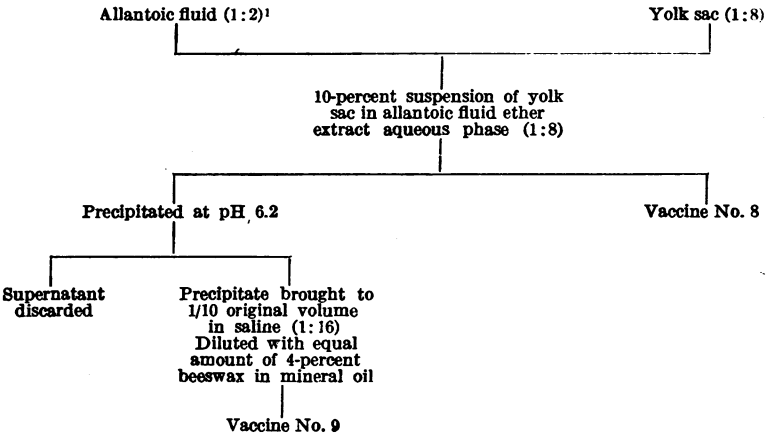
CHART 1A.—*Preparation of antigens for vaccines. Experiment 3*




[1] Antigen titer by complement fixation.

In table 2 are shown the results of immunization of monkeys with these vaccines. Protection against parotid swelling of significant degree, following challenge, was given by all vaccines except No. 9. Complement-fixation and serum-neutralization titers after immunization were irregular and quantitatively low for all monkeys except No. 384.

CHART 1B.—*Preparation of antigens for vaccines. Experiment 3*




[1] Antigen titer by complement fixation.

This monkey apparently had become immune to mumps before the vaccine was given since his serum neutralized virus before the vaccine was administered and the neutralizing antibody titer went to 1:100 after vaccine and over 1:200 after the test dose.

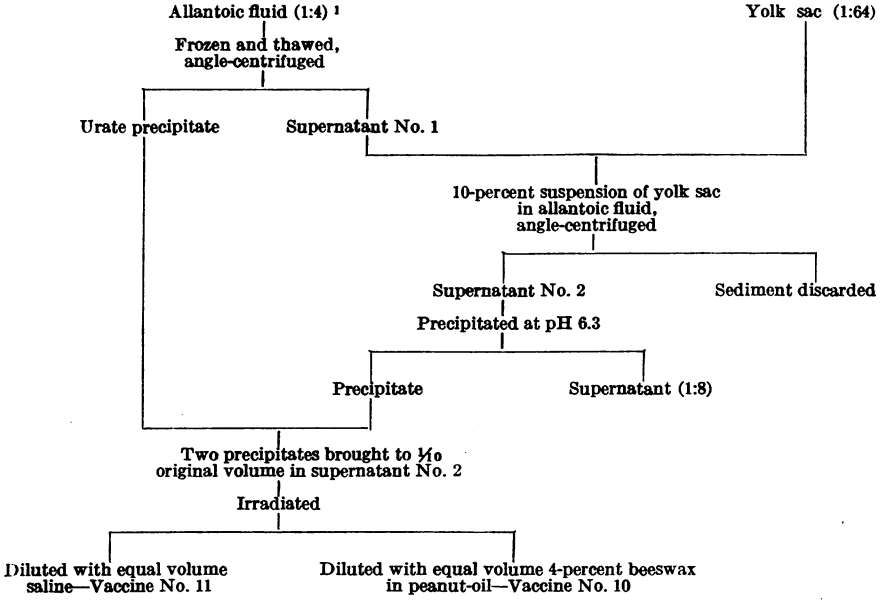
*Experiment 4.*—Allantoic fluid (titer 1:4) was frozen, then thawed, and the urate precipitate was saved. The supernatant was used as the diluent in making up a 10-percent suspension of yolk sac (titer 1:64) which was angle-centrifuged and the supernatant brought to pH 6.3. The resulting precipitate was added to the urate precipitate and the two were brought back to one-tenth original volume with the 10-percent yolk-sac supernatant.

This precipitate suspension was then irradiated. Vaccine No. 11 was made by diluting the suspension with an equal volume of saline, while No. 10 was made by diluting the same suspension with 4-percent beeswax in peanut oil (chart 2).

Two monkeys received only one dose each of vaccine No. 10, and three monkeys received two doses each at intervals of 3 weeks. Two additional monkeys received two doses of vaccine No. 11. Only one of the monkeys which had received two doses of vaccine No. 10 responded to the test dose of virus with significant parotid swelling and all developed relatively high complement-fixation (1:8 to 1:128) and neutralization-antibody titers (1:4 to 1:50) after immunization (table 2). After the test dose the complement-fixation titers increased and the neutralization titers reached the highest levels yet encountered in monkeys (1:100 to 1:800).

The antibody response of monkey No. 343 is interesting. This monkey was included in the experiment by error. Actually he was already immune from a previous experiment. His immunity was demonstrated in the 1:25 titer of neutralizing antibody before he was given any vaccine. However, after but one dose of vaccine this titer was up to 1:200 and went to 1:400 after the test virus inoculation.

CHART 2.—*Preparation of antigens for vaccines. Experiment 4*




[1] Antigen titer by complement fixation.

## Discussion

Enders et al. (*6*) have made a mumps vaccine using infected-monkey-parotid-gland suspensions inactivated with formalin as their antigen. Tests in monkeys were performed in which the complement-fixation titer of portions of the parotid glands (harvested a fixed time after test virus inoculation) was the criterion of protection. By this criterion there was some evidence of increased resistance, but virus multiplication took place in spite of immunization. No mention was made of parotid swelling in immunized as compared with control animals. Stokes et al. (*7*) used this parotid vaccine in humans who were subsequently inoculated with live virus as a test dose. An accelerated response was described in vaccinated individuals and there were two failures, but no figures are given as to the total number vaccinated.

In the experiments reported herein, the production of an immune state in vaccinated monkeys was demonstrated by three methods. By the first method the monkeys were protected against the development of clinical parotid swelling in response to monkey-passage mumps virus inoculated directly into Stenson's ducts. As pointed out by Enders, this method of testing for immunity in the monkey is probably a much more severe test than that which occurs in humans under the conditions of natural infection. The virus is introduced directly into

the parotid gland instead of having to invade that tissue by a more indirect route; and more important, perhaps, is the shorter incubation period in the monkey, giving very little time for the animal to effect an antibody response over the basic level previously established by the vaccination.

The second method of evaluating the immunity produced by the vaccination of monkeys was the determination of antibody response to the vaccine. (It is felt that virus-neutralizing antibodies are of more significance in reflecting actual immunity than are complement-fixing antibodies.) In these experiments, as the result of immunization, both types of antibodies were brought to levels comparable to those found in convalescent animals. In experiment 4, the virus-neutralizing antibody titers following vaccine varied from 1:4 to 1:50, whereas in uncomplicated mumps in humans the titer in convalescent serums averages from 1:4 to 1:10 (tested in individual and in pooled convalescent serum prepared commercially).

The virus-neutralizing antibody rise which occurs following the test dose of virus in immunized animals was the third means of demonstrating their immune state. The titer of virus-neutralizing antibody rose to 1:100 or higher (highest 1:800) within 3 weeks after the test virus. This rise was the same in the vaccinated monkeys as in monkeys already immune to mumps because of previous infection, and was significantly higher than that found in control monkeys following their first infection.

The results with the vaccines prepared in different ways were fairly uniform in respect to the prevention of parotid swelling after test virus inoculation. However, antibody responses to those vaccines employing beeswax in oil as an adjuvant were definitely higher than to the same antigens made up in saline. In fact, there was evidence to indicate that titers following one dose of the antigen mixed with adjuvant were greater than after two or three doses of those made up in saline. There were no clear-cut differences in the results following the use of antigens inactivated with ether as compared to those inactivated by ultraviolet irradiation.

These chick-embryo-antigen vaccines are now being given a clinical trial for the prevention of mumps in man.

### Summary and Conclusions

Mumps vaccines were prepared from infected chick-embryo yolk sacs and allantoic fluid.

Concentration and clarification of the antigens were accomplished by ether extraction, by precipitation of urates, and by precipitation through pH change.

Virus was inactivated by exposure to ether and to ultraviolet irradiation.

Immunity to mumps in monkeys following immunization with these vaccines was demonstrated by the absence of parotid swelling following test virus inoculation and by the antibody response to vaccine.

Vaccine antigen mixed with beeswax in oil as an adjuvant appeared to be superior to saline suspensions in producing immunity.

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## SICKNESS ABSENTEEISM AMONG INDUSTRIAL WORKERS, FIRST QUARTER OF 1946 [1]

By W. M. GAFAFER, *Principal Statistician, United States Public Health Service*

The accompanying data on 8-day or longer disabilities experienced by male employees during the first quarter of 1946 are derived from periodic reports from industrial sick benefit associations, company relief departments, and group health insurance plans. The reports cover approximately 200,000 males in various industries.

### FIRST QUARTER, 1946

Annual frequency rates by specific cause of disability are given in table 1 for the first quarters of 1946, 1945, and 1944. During the

[1] From the Industrial Hygiene Division, Bureau of State Services. The report for the year 1945 appeared in PUBLIC HEALTH REPORTS (*1*).

first quarter of 1946 the average annual number of absences per 1,000 males on account of sickness and nonindustrial injuries disabling for eight calendar days or longer is 152.4, a rate 11 percent below the corresponding frequency for 1945.

TABLE 1.—*Average annual number of absences per 1,000 males on account of sickness and nonindustrial injuries disabling for eight consecutive calendar days or longer, by cause, experience of MALE employees in various industries, first quarter of 1946 compared with first quarters of 1945 and 1944* [1]

| Cause (numbers in parentheses are disease title numbers from International List of Causes of Death, 1939) | Annual number of absences per 1,000 males for the first quarter | | |
|---|---|---|---|
| | 1946 | 1945 | 1944 |
| Sickness and nonindustrial injuries | 152.4 | 171.3 | 171.8 |
| Nonindustrial injuries (169–195) | 12.6 | 16.3 | 12.1 |
| Sickness | 139.8 | 155.0 | 159.7 |
| Respiratory diseases | 70.0 | 74.3 | 94.2 |
| Tuberculosis of respiratory system (13) | .9 | .8 | .6 |
| Influenza, grippe (33) | 35.5 | 27.5 | 52.8 |
| Bronchitis, acute and chronic (106) | 8.6 | 13.8 | 11.5 |
| Pneumonia, all forms (107–109) | 6.6 | 7.7 | 11.1 |
| Diseases of pharynx and tonsils (115b, 115c) | 4.9 | 7.3 | 6.5 |
| Other respiratory diseases (104, 105, 110–114) | 13.5 | 17.2 | 11.7 |
| Digestive diseases | 17.1 | 21.0 | 17.4 |
| Diseases of stomach except cancer (117, 118) | 5.1 | 7.7 | 5.9 |
| Diarrhea and enteritis (120) | 2.1 | 2.6 | 2.2 |
| Appendicitis (121) | 3.0 | 4.2 | 4.2 |
| Hernia (122a) | 3.2 | 2.6 | 1.7 |
| Other digestive diseases (115a, 115d, 116, 122b–129) | 3.7 | 3.9 | 3.4 |
| Nonrespiratory-nondigestive diseases | 48.5 | 54.0 | 42.2 |
| Infectious and parasitic diseases (1–12, 14–24, 26–29, 31, 32, 34–44) [2] | 3.4 | 3.5 | 2.4 |
| Rheumatism, acute and chronic (58, 59) | 5.4 | 7.3 | 5.9 |
| Neurasthenia and the like (part of 84d) | 1.8 | 2.5 | 1.8 |
| Neuralgia, neuritis, and sciatica (87b) | 3.2 | 4.1 | 3.0 |
| Other diseases of nervous system (80–85, 87, except part of 84d, and 87b) | 2.0 | 2.5 | 1.6 |
| Diseases of heart and arteries, and nephritis (90–99, 102, 130–132) | 8.4 | 9.0 | 7.6 |
| Other diseases of genitourinary system (133–138) | 3.5 | 3.5 | 3.4 |
| Diseases of skin (151–153) | 3.6 | 3.7 | 2.8 |
| Diseases of organs of movement except diseases of joints (156b) | 4.0 | 4.2 | 3.2 |
| All other diseases (45–57, 60–79, 88, 89, 100, 101, 103, 154, 155, 156a, 157, 162) | 13.2 | 13.7 | 10.5 |
| Ill-defined and unknown causes (200) | 4.2 | 5.7 | 5.9 |
| Average number of males | 195,927 | 226,282 | 256,610 |

[1] Industrial injuries and venereal diseases are not included.
[2] Exclusive of influenza and grippe, respiratory tuberculosis, and venereal diseases.

In general it will be observed in table 1 that the rates for 1946 are lower than the corresponding rates for 1945, decreases of 23, 6, 19, and 10 percent, respectively, being shown in the 1946 rates for nonindustrial injuries, respiratory diseases, digestive diseases, and nonrespiratory-nondigestive diseases. An increase, however, of almost 30 percent is yielded for the 1946 frequency of influenza and grippe, but the rate (35.5 absences per 1,000 males) is still some 33 percent below the rate recorded for the first quarter of 1944 (52.8). On the basis of the present data, the epidemic of influenza and grippe known to have occurred in the winter of 1945–46 (*1*) appears relatively less severe than the epidemic of 1943–44 (*2*).

FIRST QUARTERS, 1937–46

The variation of first-quarter rates for the broad cause groups, and influenza and grippe over the 10 years 1937–46 is shown graphically in figure 1. Attention is directed to (1) the generally increasing trend

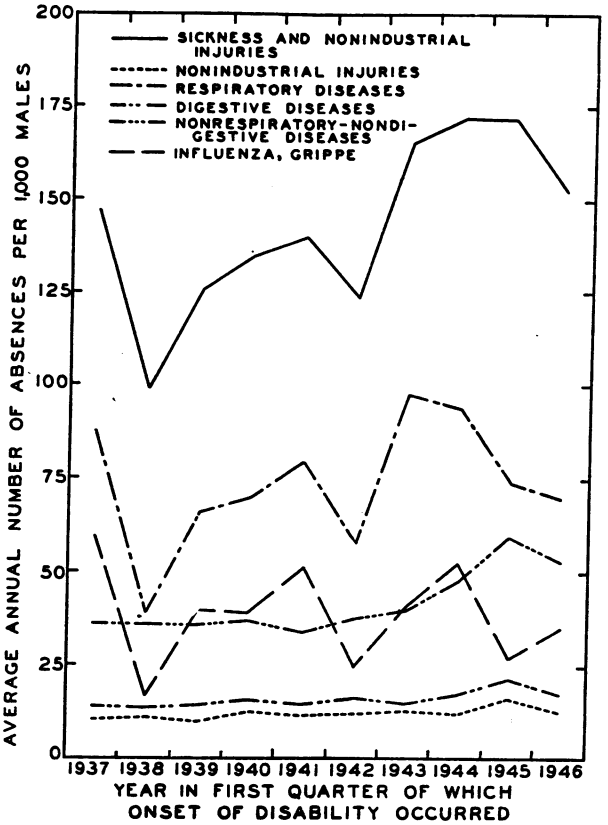


FIGURE 1.—Average annual number of absences per 1,000 males on account of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, by broad cause group; variation of first-quarter rates with time; experience of MALE employees in various industries, 1937 to 1046, inclusive.

over the 10 years in the frequency of all disabilities, (2) the decrease since 1943 in the frequency of the group of respiratory diseases, and (3) the 1946 rate for nonrespiratory-nondigestive diseases which is exceeded only by the corresponding rate for 1945 and is over 25 percent above the mean rate for the 10-year period.

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(2) ————————: Sickness absenteeism among male and female industrial workers during 1943, and among males during the first and second quarters of 1944, with a note on the respiratory epidemic of 1943–44. Pub. Health Rep., **59**: 1267–1274 (Sept. 29, 1944). (Reprint No. 2578.)

# PREVALENCE OF DISEASE

*No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring*

## UNITED STATES

### REPORTS FROM STATES FOR WEEK ENDED OCTOBER 26, 1946

**Summary**

The sharpest decline in the weekly incidence of poliomyelitis for the year to date was recorded for the current week. A total of 716 cases was reported, as compared with 977 last week, a 5-year (1941–45) median of 363, and 581 for the corresponding week in 1944. Decreases occurred in all of the 9 geographic divisions except the Mountain and the Middle Atlantic areas, where increases in the latter area were reported in New York and Pennsylvania. Of the 31 States reporting 5 or more cases, 20 reported a decrease (701 to 432), while only 7 reported increases (151 to 192). States reporting more than 10 cases currently are as follows (last week's figures in parentheses): *Increases*—New York 79 (63), Pennsylvania 15 (5), Iowa 28 (25), California 54 (51); *decreases*—Ohio 18 (32), Indiana 21 (29), Illinois 96 (99), Michigan 48 (71), Wisconsin 26 (61), Minnesota 45 (64), Missouri 31 (57), Nebraska 19 (37), Kansas 28 (70), Arkansas 11 (14), Texas 14 (18), Colorado 13 (15), Washington 18 (23); *no change*—Massachusetts 29 (29). The total for the year to date is 22,373, as compared with 17,437 for the corresponding period of 1944 and a 5-year median of 11,120.

Current figures for diphtheria, influenza, measles, meningococcus meningitis, Rocky Mountain spotted fever, scarlet fever, smallpox, typhoid and paratyphoid fever, endemic typhus fever, and whooping cough are below the respective corresponding 5-year medians. The cumulative figures for scarlet fever and typhoid fever are below any corresponding figures of the past 5 years, and those for endemic typhus fever for the past 4 years and for meningococcus meningitis for the past 3 years. Because of the high incidence earlier in the year, the cumulative figures for diphtheria, influenza, and measles are above the respective 5-year medians.

A total of 8,739 deaths was recorded during the week in 93 large cities of the United States, as compared with 8,743 last week, 8,814 and 9,004, respectively, for the corresponding weeks of 1945 and 1944, and a 3-year (1943–45) average of 8,918. The total for the year to date is 388,589, as compared with 384,867 for the corresponding period of last year.

*Telegraphic morbidity reports from State health officers for the week ended Oct. 26, 1946, and comparison with corresponding week of 1945 and 5-year median*

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

| Division and State | Diphtheria | | | Influenza | | | Measles | | | Meningitis, meningococcus | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Week ended— | | Median 1941–45 | Week ended— | | Median 1941–45 | Week ended— | | Median 1941–45 | Week ended— | | Median 1941–45 |
| | Oct. 26, 1946 | Oct. 27, 1945 | | Oct. 26, 1946 | Oct. 27, 1945 | | Oct. 26, 1946 | Oct. 27, 1945 | | Oct. 26, 1946 | Oct. 27, 1945 | |
| **NEW ENGLAND** | | | | | | | | | | | | |
| Maine | 0 | 0 | 0 | ---- | ---- | ---- | 70 | 2 | 2 | 1 | 1 | 2 |
| New Hampshire | 0 | 0 | 0 | ---- | ---- | ---- | 16 | ---- | 1 | 0 | 0 | 0 |
| Vermont | 0 | 0 | 0 | ---- | ---- | ---- | 49 | ---- | 1 | 0 | 0 | 0 |
| Massachusetts | 24 | 3 | 3 | ---- | ---- | ---- | 185 | 210 | 171 | 0 | 5 | 5 |
| Rhode Island | 0 | 0 | 0 | ---- | 9 | ---- | 2 | ---- | 9 | 0 | 0 | 1 |
| Connecticut | 1 | 1 | 0 | 4 | ---- | ---- | 25 | 9 | 9 | 2 | 2 | 2 |
| **MIDDLE ATLANTIC** | | | | | | | | | | | | |
| New York | 24 | 21 | 16 | [1] 3 | [1] 4 | [1] 4 | 85 | 37 | 71 | 5 | 11 | 17 |
| New Jersey | 4 | 6 | 6 | 4 | 7 | 4 | 30 | 17 | 22 | 1 | 3 | 4 |
| Pennsylvania | 12 | 8 | 13 | 2 | 2 | 1 | 127 | 198 | 112 | 5 | 3 | 7 |
| **EAST NORTH CENTRAL** | | | | | | | | | | | | |
| Ohio | 11 | 58 | 20 | 4 | 4 | 5 | 92 | 8 | 23 | 4 | 10 | 4 |
| Indiana | 14 | 25 | 17 | ---- | 18 | 14 | 9 | 5 | 5 | 0 | 1 | 1 |
| Illinois | 6 | 10 | 12 | 4 | 2 | 7 | 18 | 120 | 23 | 7 | 8 | 8 |
| Michigan [2] | 1 | 13 | 10 | ---- | 1 | 1 | 36 | 107 | 39 | 2 | 3 | 3 |
| Wisconsin | 3 | 4 | 2 | 8 | 16 | 16 | 34 | 21 | 43 | 1 | 2 | 2 |
| **WEST NORTH CENTRAL** | | | | | | | | | | | | |
| Minnesota | 8 | 9 | 8 | ---- | ---- | ---- | 5 | 2 | 4 | 2 | 4 | 1 |
| Iowa | 4 | 3 | 2 | ---- | ---- | ---- | 1 | 3 | 7 | 4 | 0 | 0 |
| Missouri | 11 | 5 | 5 | 8 | ---- | 5 | ---- | 3 | 3 | 0 | 7 | 5 |
| North Dakota | 4 | 4 | 1 | ---- | ---- | ---- | ---- | 2 | 2 | 2 | 0 | 0 |
| South Dakota | 1 | 0 | 1 | ---- | ---- | ---- | 1 | ---- | 2 | 0 | 1 | 1 |
| Nebraska | 7 | 3 | 3 | 2 | ---- | 1 | 1 | 3 | 6 | 0 | 0 | 0 |
| Kansas | 5 | 4 | 4 | ---- | 2 | ---- | 2 | 15 | 15 | 0 | 2 | 1 |
| **SOUTH ATLANTIC** | | | | | | | | | | | | |
| Delaware | 0 | 1 | 1 | ---- | ---- | ---- | 1 | ---- | ---- | 0 | 0 | 0 |
| Maryland [2] | 15 | 20 | 6 | 2 | 2 | 2 | 6 | 3 | 5 | 1 | 0 | 3 |
| District of Columbia | 1 | 0 | 0 | 1 | 1 | 1 | 3 | 3 | 2 | 0 | 1 | 1 |
| Virginia | 13 | 39 | 39 | 194 | 192 | 177 | 26 | 19 | 19 | 2 | 0 | 4 |
| West Virginia | 2 | 17 | 14 | 6 | ---- | 8 | 5 | ---- | 3 | 1 | 0 | 0 |
| North Carolina | 20 | 108 | 59 | ---- | ---- | 2 | 25 | 3 | 10 | 1 | 1 | 2 |
| South Carolina | 1 | 36 | 30 | 49 | 558 | 211 | 1 | 28 | 6 | 0 | 0 | 0 |
| Georgia | 15 | 51 | 33 | 5 | 29 | 19 | 15 | 4 | 4 | 0 | 2 | 2 |
| Florida | 13 | 9 | 13 | 4 | 1 | 2 | 2 | 5 | 2 | 1 | 0 | 1 |
| **EAST SOUTH CENTRAL** | | | | | | | | | | | | |
| Kentucky | 31 | 24 | 11 | ---- | 9 | 1 | ---- | 41 | 6 | 2 | 1 | 1 |
| Tennessee | 18 | 53 | 15 | 4 | 22 | 15 | 9 | 2 | 5 | 4 | 1 | 3 |
| Alabama | 15 | 39 | 41 | 44 | 79 | 30 | 3 | 2 | 3 | 5 | 5 | 2 |
| Mississippi [2] | 14 | 42 | 17 | ---- | ---- | ---- | ---- | ---- | ---- | 0 | 0 | 1 |
| **WEST SOUTH CENTRAL** | | | | | | | | | | | | |
| Arkansas | 20 | 26 | 20 | 15 | 57 | 23 | 8 | 4 | 4 | 3 | 3 | 1 |
| Louisiana | 7 | 32 | 5 | ---- | 10 | 2 | 2 | 3 | 1 | 0 | 2 | 1 |
| Oklahoma | 15 | 9 | 9 | 22 | 40 | 40 | 3 | 4 | 4 | 4 | 0 | 0 |
| Texas | 29 | 78 | 78 | 930 | 1,176 | 737 | 54 | 34 | 17 | 6 | 6 | 2 |
| **MOUNTAIN** | | | | | | | | | | | | |
| Montana | 1 | 4 | 2 | ---- | 1 | ---- | 20 | 17 | 9 | 0 | 0 | 0 |
| Idaho | 0 | 1 | 0 | 4 | 5 | 2 | 5 | 60 | 9 | 0 | 0 | 0 |
| Wyoming | 0 | 0 | 0 | ---- | ---- | 2 | ---- | 1 | 1 | 0 | 0 | 0 |
| Colorado | 3 | 8 | 9 | 23 | 38 | 28 | 7 | 66 | 11 | 0 | 1 | 0 |
| New Mexico | 2 | 1 | 1 | ---- | 3 | 1 | 4 | 2 | 2 | 0 | 1 | 1 |
| Arizona | 2 | 1 | 3 | 43 | 57 | 57 | 30 | ---- | 5 | 0 | 0 | 0 |
| Utah [2] | 0 | 2 | 0 | ---- | ---- | 1 | 1 | 9 | 6 | 0 | 0 | 0 |
| Nevada | 0 | 0 | 0 | ---- | ---- | ---- | 1 | ---- | ---- | 0 | 0 | 0 |
| **PACIFIC** | | | | | | | | | | | | |
| Washington | 4 | 6 | 6 | ---- | ---- | ---- | 33 | 128 | 28 | 2 | 2 | 2 |
| Oregon | 1 | 6 | 6 | 13 | 3 | 9 | 8 | 15 | 23 | 2 | 0 | 1 |
| California | 19 | 42 | 33 | 12 | 23 | 23 | 60 | 191 | 128 | 7 | 8 | 8 |
| Total | 401 | 832 | 596 | 1,410 | 2,371 | 1,417 | 1,120 | 1,406 | 1,406 | 77 | 97 | 97 |
| 43 weeks | 12,914 | 13,383 | 11,789 | 201,458 | 82,972 | 91,225 | 645,852 | 108,793 | 551,026 | 5,079 | 7,015 | 7,015 |

[1] New York City only.

[2] Period ended earlier than Saturday.

*Telegraphic morbidity reports from State health officers for the week ended Oct. 26, 1946, and comparison with corresponding week of 1945 and 5-year median*—Con.

| Division and State | Poliomyelitis | | | Scarlet fever | | | Smallpox | | | Typhoid and paratyphoid fever [3] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Week ended— | | Median 1941–45 | Week ended— | | Median 1941–45 | Week ended— | | Median 1941–45 | Week ended— | | Median 1941–45 |
| | Oct. 26, 1946 | Oct. 27, 1945 | | Oct. 26, 1946 | Oct. 27, 1945 | | Oct. 26, 1946 | Oct. 27, 1945 | | Oct. 26, 1946 | Oct. 27, 1945 | |
| **NEW ENGLAND** | | | | | | | | | | | | |
| Maine | 5 | 2 | 0 | 39 | 30 | 17 | 0 | 0 | 0 | 0 | 4 | 1 |
| New Hampshire | 5 | 1 | 0 | 8 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 |
| Vermont | 5 | 2 | 1 | 6 | 7 | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| Massachusetts | 29 | 21 | 11 | 54 | 102 | 121 | 0 | 0 | 0 | 4 | 0 | 4 |
| Rhode Island | 2 | 0 | 0 | 3 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Connecticut | 8 | 8 | 7 | 21 | 20 | 21 | 0 | 0 | 0 | 0 | 2 | 1 |
| **MIDDLE ATLANTIC** | | | | | | | | | | | | |
| New York | 79 | 48 | 48 | 107 | 164 | 168 | 0 | 0 | 0 | 5 | 10 | 8 |
| New Jersey | 6 | 26 | 15 | 47 | 41 | 48 | 0 | 0 | 0 | 1 | 4 | 4 |
| Pennsylvania | 15 | 22 | 16 | 99 | 144 | 139 | 0 | 0 | 0 | 13 | 6 | 6 |
| **EAST NORTH CENTRAL** | | | | | | | | | | | | |
| Ohio | 18 | 29 | 17 | 173 | 217 | 204 | 0 | 0 | 0 | 4 | 9 | 4 |
| Indiana | 21 | 5 | 5 | 65 | 52 | 51 | 1 | 0 | 0 | 4 | 2 | 0 |
| Illinois | 96 | 51 | 27 | 91 | 138 | 138 | 0 | 0 | 1 | 1 | 3 | 3 |
| Michigan [2] | 48 | 5 | 8 | 129 | 112 | 112 | 0 | 0 | 0 | 2 | 0 | 1 |
| Wisconsin | 26 | 45 | 5 | 49 | 60 | 96 | 0 | 0 | 0 | 0 | 0 | 1 |
| **WEST NORTH CENTRAL** | | | | | | | | | | | | |
| Minnesota | 45 | 13 | 13 | 33 | 19 | 46 | 0 | 0 | 0 | 0 | 1 | 0 |
| Iowa | 28 | 25 | 2 | 31 | 41 | 41 | 0 | 0 | 0 | 2 | 0 | 0 |
| Missouri | 31 | 14 | 2 | 21 | 51 | 34 | 0 | 2 | 0 | 3 | 3 | 2 |
| North Dakota | 6 | 0 | 0 | 7 | 17 | 9 | 0 | 1 | 0 | 0 | 2 | 0 |
| South Dakota | 4 | 0 | 0 | 7 | 4 | 17 | 0 | 0 | 0 | 0 | 0 | 1 |
| Nebraska | 19 | 2 | 3 | 17 | 13 | 13 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kansas | 28 | 7 | 7 | 21 | 66 | 60 | 0 | 0 | 0 | 0 | 0 | 1 |
| **SOUTH ATLANTIC** | | | | | | | | | | | | |
| Delaware | 1 | 3 | 3 | 6 | 4 | 4 | 0 | 0 | 0 | 1 | 0 | 1 |
| Maryland [2] | 6 | 0 | 1 | 10 | 40 | 35 | 0 | 0 | 0 | 0 | 2 | 2 |
| District of Columbia | 1 | 3 | 3 | 11 | 13 | 14 | 0 | 0 | 0 | 0 | 3 | 0 |
| Virginia | 4 | 9 | 6 | 40 | 137 | 77 | 0 | 0 | 0 | 1 | 8 | 8 |
| West Virginia | 3 | 1 | 1 | 74 | 102 | 63 | 0 | 0 | 0 | 1 | 2 | 1 |
| North Carolina | 4 | 4 | 4 | 34 | 114 | 113 | 0 | 0 | 0 | 2 | 1 | 2 |
| South Carolina | 0 | 2 | 2 | 1 | 10 | 12 | 0 | 0 | 0 | 1 | 1 | 1 |
| Georgia | 8 | 2 | 1 | 18 | 36 | 36 | 0 | 0 | 0 | 4 | 4 | 5 |
| Florida | 6 | 6 | 2 | 6 | 5 | 8 | 1 | 0 | 0 | 0 | 0 | 0 |
| **EAST SOUTH CENTRAL** | | | | | | | | | | | | |
| Kentucky | 4 | 4 | 5 | 52 | 49 | 50 | 0 | 0 | 0 | 4 | 5 | 5 |
| Tennessee | 2 | 25 | 4 | 24 | 41 | 80 | 0 | 0 | 0 | 1 | 2 | 4 |
| Alabama | 3 | 3 | 4 | 24 | 22 | 36 | 0 | 0 | 0 | 0 | 4 | 4 |
| Mississippi [2] | 4 | 4 | 2 | 10 | 34 | 14 | 0 | 1 | 1 | 2 | 5 | 4 |
| **WEST SOUTH CENTRAL** | | | | | | | | | | | | |
| Arkansas | 11 | 0 | 0 | 6 | 13 | 7 | 0 | 1 | 0 | 0 | 2 | 3 |
| Louisiana | 7 | 9 | 1 | 13 | 33 | 8 | 0 | 0 | 0 | 1 | 1 | 3 |
| Oklahoma | 5 | 0 | 1 | 4 | 25 | 20 | 0 | 0 | 0 | 1 | 0 | 0 |
| Texas | 14 | 17 | 12 | 26 | 94 | 57 | 0 | 0 | 0 | 5 | 8 | 10 |
| **MOUNTAIN** | | | | | | | | | | | | |
| Montana | 2 | 5 | 0 | 6 | 12 | 18 | 0 | 0 | 0 | 0 | 4 | 0 |
| Idaho | 5 | 2 | 0 | 11 | 6 | 13 | 0 | 0 | 0 | 1 | 0 | 0 |
| Wyoming | 3 | 1 | 0 | 5 | 1 | 1 | 4 | 0 | 0 | 0 | 0 | 0 |
| Colorado | 13 | 7 | 2 | 33 | 19 | 19 | 0 | 0 | 0 | 0 | 2 | 2 |
| New Mexico | 3 | 3 | 1 | 5 | 14 | 6 | 0 | 0 | 0 | 0 | 1 | 1 |
| Arizona | 2 | 0 | 0 | 19 | 11 | 10 | 0 | 0 | 0 | 1 | 0 | 1 |
| Utah [2] | 5 | 6 | 3 | 9 | 5 | 8 | 0 | 0 | 0 | 0 | 2 | 0 |
| Nevada | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **PACIFIC** | | | | | | | | | | | | |
| Washington | 18 | 6 | 6 | 45 | 39 | 38 | 0 | 0 | 0 | 1 | 0 | 1 |
| Oregon | 4 | 5 | 5 | 16 | 18 | 18 | 0 | 1 | 0 | 0 | 0 | 1 |
| California | 54 | 36 | 21 | 130 | 214 | 148 | 0 | 0 | 0 | 4 | 2 | 2 |
| Total | 716 | 489 | 363 | 1,666 | 2,412 | 2,355 | 6 | 6 | 7 | 71 | 105 | 105 |
| 43 weeks | 22,373 | 11,952 | 11,120 | 96,107 | 148,683 | 113,474 | 306 | 301 | 648 | 3,535 | 4,271 | 4,827 |

[2] Period ended earlier than Saturday.

[3] Including paratyphoid fever reported separately as follows: Massachusetts (salmonella infection) 2; New York 2; Ohio 1; West Virginia 1; Georgia 2; Texas 3; California 2.

*Telegraphic morbidity reports from State health officers for the week ended Oct. 26, 1946, and comparison with corresponding week of 1945 and 5-year median*—Con.

| Division and State | Whooping cough | | | Week ended Oct. 26, 1945 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Week ended— | | Median 1940–45 | Dysentery | | | Encephalitis, infectious | Rocky Mt. spotted fever | Tularemia | Typhus fever endemic | Undulant fever |
| | Oct. 26, 1946 | Oct. 27, 1945 | | Amebic | Bacillary | Unspecified | | | | | |
| NEW ENGLAND | | | | | | | | | | | |
| Maine | 6 | 28 | 28 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 2 |
| New Hampshire | 3 | 2 | 2 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 1 |
| Vermont | 9 | 7 | 17 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Massachusetts | 141 | 128 | 128 | ----- | 1 | ----- | ----- | ----- | ----- | ----- | 1 |
| Rhode Island | 32 | 6 | 6 | ----- | 1 | ----- | ----- | ----- | ----- | ----- | ----- |
| Connecticut | 17 | 27 | 49 | 1 | 1 | ----- | ----- | ----- | ----- | ----- | 8 |
| MIDDLE ATLANTIC | | | | | | | | | | | |
| New York | 140 | 243 | 250 | 12 | 86 | ----- | 1 | ----- | ----- | ----- | 5 |
| New Jersey | 118 | 164 | 164 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 2 |
| Pennsylvania | 139 | 209 | 209 | ----- | 1 | ----- | 1 | ----- | ----- | ----- | 1 |
| EAST NORTH CENTRAL | | | | | | | | | | | |
| Ohio | 52 | 164 | 152 | 5 | ----- | 2 | 1 | ----- | ----- | ----- | 5 |
| Indiana | 17 | 43 | 16 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 3 |
| Illinois | 90 | 96 | 137 | 7 | ----- | ----- | 2 | ----- | 2 | ----- | 6 |
| Michigan [2] | 196 | 104 | 128 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 1 |
| Wisconsin | 155 | 50 | 130 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 3 |
| WEST NORTH CENTRAL | | | | | | | | | | | |
| Minnesota | 6 | 20 | 53 | 2 | ----- | ----- | ----- | ----- | ----- | ----- | 4 |
| Iowa | 9 | 3 | 16 | 2 | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Missouri | 17 | 5 | 16 | ----- | ----- | 1 | ----- | ----- | 2 | ----- | 1 |
| North Dakota | ----- | 1 | 6 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| South Dakota | 1 | 1 | 1 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Nebraska | 2 | ----- | 9 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Kansas | 16 | 17 | 30 | 1 | ----- | ----- | ----- | ----- | 1 | ----- | 2 |
| SOUTH ATLANTIC | | | | | | | | | | | |
| Delaware | 1 | 1 | 2 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Maryland [2] | 24 | 50 | 50 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 1 |
| District of Columbia | 7 | 11 | 11 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Virginia | 82 | 25 | 25 | ----- | ----- | 41 | ----- | ----- | ----- | 1 | 1 |
| West Virginia | 13 | 7 | 13 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| North Carolina | 30 | 64 | 64 | ----- | ----- | ----- | ----- | ----- | 3 | 3 | ----- |
| South Carolina | 3 | 79 | 32 | ----- | 5 | ----- | ----- | ----- | ----- | ----- | ----- |
| Georgia | 2 | 27 | 9 | ----- | 5 | ----- | ----- | ----- | ----- | 12 | ----- |
| Florida | 15 | 6 | 6 | ----- | ----- | 5 | ----- | ----- | ----- | 7 | ----- |
| EAST SOUTH CENTRAL | | | | | | | | | | | |
| Kentucky | 11 | 45 | 45 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 1 |
| Tennessee | 14 | 15 | 21 | 1 | ----- | ----- | ----- | ----- | 1 | 1 | 1 |
| Alabama | 14 | 21 | 21 | 2 | ----- | ----- | ----- | ----- | ----- | 4 | 1 |
| Mississippi [2] | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 1 | ----- | ----- | 2 |
| WEST SOUTH CENTRAL | | | | | | | | | | | |
| Arkansas | 9 | 3 | 16 | ----- | ----- | ----- | ----- | ----- | 1 | ----- | 1 |
| Louisiana | 1 | 2 | 2 | 4 | ----- | ----- | ----- | ----- | 1 | 3 | ----- |
| Oklahoma | 1 | 8 | 5 | ----- | ----- | ----- | 1 | ----- | ----- | ----- | ----- |
| Texas | 120 | 99 | 72 | 8 | 149 | 21 | 2 | ----- | ----- | 21 | 7 |
| MOUNTAIN | | | | | | | | | | | |
| Montana | 1 | 7 | 23 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Idaho | ----- | 6 | 3 | ----- | ----- | ----- | 1 | ----- | 1 | ----- | ----- |
| Wyoming | 1 | 2 | 5 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| Colorado | 18 | 15 | 15 | ----- | 1 | ----- | 1 | ----- | ----- | ----- | 2 |
| New Mexico | 4 | 27 | 6 | ----- | 1 | ----- | ----- | • | ----- | ----- | ----- |
| Arizona | 6 | 11 | 7 | ----- | ----- | 19 | ----- | ----- | ----- | ----- | ----- |
| Utah [2] | 2 | 12 | 12 | ----- | ----- | ----- | ----- | ----- | 1 | ----- | ----- |
| Nevada | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| PACIFIC | | | | | | | | | | | |
| Washington | 11 | 38 | 38 | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 1 |
| Oregon | 8 | 8 | 8 | 5 | ----- | ----- | ----- | 2 | ----- | ----- | ----- |
| California | 56 | 116 | 116 | 4 | 14 | ----- | 4 | ----- | 1 | 2 | 9 |
| Total | 1,620 | 2,023 | 2,177 | 54 | 265 | 89 | 14 | 3 | 14 | 54 | 72 |
| Same week, 1945 | 2,023 | ----- | ----- | 48 | 360 | 94 | 10 | 1 | 5 | 90 | 101 |
| Average, 1942–45 | 1,915 | ----- | ----- | 40 | 420 | 105 | 9 | [4] 4 | 7 | [4] 109 | ----- |
| 43 weeks: 1946 | 82,058 | ----- | ----- | 2,012 | 13,768 | 5,558 | 543 | 549 | 775 | 2,942 | 4,307 |
| 1945 | 104,825 | ----- | ----- | 1,618 | 21,645 | 9,517 | 552 | 451 | 626 | 4,155 | 3,970 |
| Average, 1943–45 | 113,696 | ----- | [4]149,727 | 1,640 | 18,459 | 7,943 | 569 | [4] 445 | 595 | [4] 3,588 | ----- |

[2] Period ended earlier than Saturday.

[4] 5-year median, 1941–45.

*Anthrax:* Pennsylvania, 1 case.

# WEEKLY REPORTS FROM CITIES

*City reports for week ended Oct. 19, 1946*

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

| Division, State, and City | Diphtheria cases | Encephalitis, infectious, cases | Influenza | | Measles cases | Meningitis, meningococcus, cases | Pneumonia deaths | Poliomyelitis cases | Scarlet fever cases | Smallpox cases | Typhoid and paratyphoid fever cases | Whooping cough cases |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cases | Deaths | | | | | | | | |
| **NEW ENGLAND** | | | | | | | | | | | | |
| Maine: | | | | | | | | | | | | |
| Portland | 0 | 0 | ------ | 0 | ------- | 1 | 0 | 0 | 1 | 0 | 0 | 2 |
| New Hampshire: | | | | | | | | | | | | |
| Concord | 0 | 0 | ------ | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | ------ |
| Massachusetts: | | | | | | | | | | | | |
| Boston | 2 | 0 | ------ | 0 | 10 | 0 | 7 | 24 | 6 | 0 | 0 | 25 |
| Fall River | 0 | 0 | ------ | 0 | ------- | 0 | 2 | 0 | 0 | 0 | 0 | ------ |
| Springfield | 0 | 0 | ------ | 0 | 11 | 1 | 1 | 0 | 2 | 0 | 0 | 7 |
| Worcester | 0 | 0 | ------ | 0 | 2 | 0 | 7 | 9 | 1 | 0 | 0 | 9 |
| Rhode Island: | | | | | | | | | | | | |
| Providence | 0 | 0 | ------ | 0 | 8 | 0 | 2 | 2 | 3 | 0 | 0 | 15 |
| Connecticut: | | | | | | | | | | | | |
| Bridgeport | 0 | 0 | ------ | 0 | ------- | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Hartford | 0 | 0 | ------ | 0 | ------- | 0 | 0 | 2 | 1 | 0 | 0 | 3 |
| New Haven | 0 | 0 | ------ | 0 | 9 | 0 | 0 | 0 | 4 | 0 | 0 | 2 |
| **MIDDLE ATLANTIC** | | | | | | | | | | | | |
| New York: | | | | | | | | | | | | |
| Buffalo | 2 | 0 | ------ | 1 | 2 | 0 | 3 | 0 | 5 | 0 | 0 | 7 |
| New York | 15 | 1 | 3 | 0 | 8 | 0 | 24 | 41 | 33 | 0 | 4 | 38 |
| Rochester | 0 | 0 | ------ | 0 | ------- | 0 | 2 | 1 | 4 | 0 | 0 | ------ |
| Syracuse | 0 | 0 | ------ | 0 | ------- | 0 | 1 | 0 | 2 | 0 | 0 | 6 |
| New Jersey: | | | | | | | | | | | | |
| Camden | 0 | 0 | ------ | 1 | ------- | 0 | 1 | 0 | 0 | 0 | 0 | 4 |
| Newark | 0 | 0 | ------ | 0 | 1 | 1 | 3 | 1 | 4 | 0 | 0 | 11 |
| Trenton | 0 | 0 | ------ | 0 | ------- | 0 | 2 | 0 | 0 | 0 | 0 | ------ |
| Pennsylvania: | | | | | | | | | | | | |
| Philadelphia | 2 | 0 | 1 | 1 | 1 | 1 | 10 | 2 | 0 | 0 | 0 | 21 |
| Pittsburgh | 2 | 0 | ------ | 0 | 30 | 3 | 13 | 0 | 6 | 0 | 0 | 1 |
| Reading | 0 | 0 | ------ | 0 | ------- | 0 | 2 | 0 | 0 | 0 | 0 | 8 |
| **EAST NORTH CENTRAL** | | | | | | | | | | | | |
| Ohio: | | | | | | | | | | | | |
| Cincinnati | 0 | 0 | ------ | 0 | ------- | 1 | 2 | 0 | 8 | 0 | 0 | 3 |
| Cleveland | 0 | 0 | 2 | 1 | 44 | 1 | 7 | 12 | 16 | 0 | 1 | 11 |
| Columbus | 1 | 0 | 1 | 1 | 3 | 0 | 1 | 0 | 10 | 0 | 0 | 2 |
| Indiana: | | | | | | | | | | | | |
| Fort Wayne | 0 | 0 | ------ | 1 | ------- | 0 | 2 | 0 | 0 | 0 | 0 | ------ |
| Indianapolis | 0 | 0 | ------ | 0 | 2 | 0 | 1 | 5 | 3 | 0 | 2 | 3 |
| South Bend | 0 | 0 | ------ | 0 | ------- | 0 | 0 | 1 | 1 | 0 | 0 | ------ |
| Terre Haute | 0 | 0 | ------ | 0 | ------- | 0 | 3 | 0 | 0 | 0 | 0 | ------ |
| Illinois: | | | | | | | | | | | | |
| Chicago | 3 | 0 | 4 | 0 | 6 | 2 | 19 | 29 | 37 | 0 | 1 | 45 |
| Springfield | 0 | 0 | ------ | 0 | ------- | 0 | 3 | 0 | 1 | 0 | 0 | ------ |
| Michigan: | | | | | | | | | | | | |
| Detroit | 1 | 0 | ------ | 0 | 1 | 0 | 9 | 12 | 35 | 0 | 0 | 83 |
| Flint | 0 | 0 | ------ | 0 | ------- | 0 | 5 | 0 | 5 | 0 | 0 | 3 |
| Grand Rapids | 0 | 0 | ------ | 0 | 4 | 0 | 0 | 1 | 2 | 0 | 0 | 15 |
| Wisconsin: | | | | | | | | | | | | |
| Kenosha | 0 | 0 | ------ | 0 | ------- | 0 | 0 | 1 | 0 | 0 | 0 | ------ |
| Milwaukee | 0 | 1 | ------ | 0 | 5 | 1 | 0 | 3 | 9 | 0 | 0 | 87 |
| Racine | 0 | 0 | ------ | 0 | ------- | 0 | 0 | 1 | 3 | 0 | 0 | ------ |
| Superior | 0 | 0 | ------ | 0 | ------- | 0 | 0 | 2 | 0 | 0 | 0 | ------ |
| **WEST NORTH CENTRAL** | | | | | | | | | | | | |
| Minnesota: | | | | | | | | | | | | |
| Duluth | 0 | 0 | ------ | 0 | ------- | 0 | 0 | 1 | 0 | 0 | 0 | ------ |
| Minneapolis | 3 | 0 | ------ | 0 | ------- | 2 | 3 | 5 | 6 | 0 | 0 | ------ |
| St. Paul | 1 | 0 | ------ | 0 | ------- | 0 | 4 | 3 | 6 | 0 | 0 | 2 |
| Missouri: | | | | | | | | | | | | |
| Kansas City | 5 | 0 | ------ | 0 | ------- | 0 | 2 | 12 | 9 | 0 | 0 | 2 |
| St. Joseph | 0 | 0 | ------ | 0 | ------- | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| St. Louis | 3 | 0 | 1 | 0 | 1 | 2 | 7 | 21 | 3 | 0 | 0 | 3 |

*City reports for week ended Oct. 19, 1946*—Continued

| Division, State, and City | Diphtheria cases | Encephalitis, infectious, cases | Influenza | | Measles cases | Meningitis, meningococcus, cases | Pneumonia deaths | Poliomyelitis cases | Scarlet fever cases | Smallpox cases | Typhoid and paratyphoid fever cases | Whooping cough cases |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cases | Deaths | | | | | | | | |
| **WEST NORTH CENTRAL—continued** | | | | | | | | | | | | |
| Nebraska: | | | | | | | | | | | | |
| Omaha | 1 | 0 | ------ | 0 | 1 | 0 | 1 | 13 | 6 | 0 | 0 | ------ |
| Kansas: | | | | | | | | | | | | |
| Topeka | 0 | 0 | ------ | 0 | 1 | 0 | 0 | 2 | 2 | 0 | 0 | ------ |
| Wichita | 0 | 0 | ------ | 0 | ------ | 0 | 4 | 0 | 5 | 0 | 0 | ------ |
| **SOUTH ATLANTIC** | | | | | | | | | | | | |
| Delaware: | | | | | | | | | | | | |
| Wilmington | 0 | 0 | ------ | 0 | 2 | 0 | 2 | 1 | 1 | 0 | 0 | ------ |
| Maryland: | | | | | | | | | | | | |
| Baltimore | 2 | 0 | ------ | 0 | 1 | 0 | 6 | 2 | 4 | 0 | 1 | 20 |
| Cumberland | 0 | 0 | ------ | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | ------ |
| Frederick | 0 | 0 | ------ | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | ------ |
| District of Columbia: | | | | | | | | | | | | |
| Washington | 0 | 0 | ------ | 0 | 1 | 1 | 1 | 1 | 4 | 0 | 0 | 7 |
| Virginia: | | | | | | | | | | | | |
| Lynchburg | 0 | 0 | ------ | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | ------ |
| Richmond | 0 | 0 | ------ | 0 | 7 | 0 | 0 | 0 | 2 | 0 | 1 | 3 |
| Roanoke | 0 | 0 | ------ | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | ------ |
| West Virginia: | | | | | | | | | | | | |
| Charleston | 0 | 0 | ------ | 0 | ------ | 0 | 0 | 0 | 2 | 0 | 0 | ------ |
| Wheeling | 0 | 0 | ------ | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | ------ |
| North Carolina: | | | | | | | | | | | | |
| Raleigh | 0 | 0 | ------ | 0 | ------ | 0 | 1 | 0 | 0 | 0 | 0 | 2 |
| Wilmington | 0 | 0 | ------ | 0 | ------ | 0 | 2 | 0 | 0 | 0 | 0 | ------ |
| Winston-Salem | 0 | 0 | ------ | 0 | 13 | 0 | 1 | 0 | 5 | 0 | 0 | 5 |
| South Carolina: | | | | | | | | | | | | |
| Charleston | 0 | 0 | 2 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 1 |
| Georgia: | | | | | | | | | | | | |
| Atlanta | 0 | 0 | 3 | 0 | ------ | 0 | 3 | 1 | 3 | 0 | 2 | ------ |
| Brunswick | 0 | 0 | ------ | 0 | ------ | 0 | 1 | 0 | 0 | 0 | 0 | 4 |
| Florida: | | | | | | | | | | | | |
| Tampa | 2 | 0 | ------ | 0 | ------ | 0 | 0 | 0 | 4 | 0 | 0 | ------ |
| **EAST SOUTH CENTRAL** | | | | | | | | | | | | |
| Tennessee: | | | | | | | | | | | | |
| Memphis | 1 | 0 | ------ | 0 | 2 | 0 | 12 | 3 | 2 | 0 | 1 | 2 |
| Nashville | 0 | 0 | ------ | 0 | ------ | 0 | 2 | 0 | 0 | 0 | 0 | ------ |
| Alabama: | | | | | | | | | | | | |
| Birmingham | 3 | 0 | ------ | 0 | 1 | 0 | 2 | 1 | 3 | 0 | 2 | ------ |
| Mobile | 3 | 0 | ------ | 0 | ------ | 0 | 0 | 0 | 2 | 0 | 0 | ------ |
| **WEST SOUTH CENTRAL** | | | | | | | | | | | | |
| Arkansas: | | | | | | | | | | | | |
| Little Rock | 0 | 0 | ------ | 0 | ------ | 0 | 2 | 1 | 0 | 0 | 0 | ------ |
| Louisiana: | | | | | | | | | | | | |
| New Orleans | 2 | 0 | ------ | 0 | ------ | 0 | 3 | 6 | 0 | 0 | 1 | 1 |
| Shreveport | 0 | 0 | ------ | 0 | ------ | 0 | 4 | 1 | 0 | 0 | 0 | ------ |
| Texas: | | | | | | | | | | | | |
| Dallas | 2 | 0 | ------ | 0 | ------ | 0 | 2 | 1 | 0 | 0 | 0 | ------ |
| Galveston | 0 | 0 | ------ | 0 | ------ | 0 | 1 | 0 | 0 | 0 | 1 | ------ |
| Houston | 3 | 0 | ------ | 0 | ------ | 0 | 1 | 1 | 1 | 0 | 0 | 1 |
| San Antonio | 1 | 0 | ------ | 1 | ------ | 1 | 1 | 3 | 0 | 0 | 0 | ------ |
| **MOUNTAIN** | | | | | | | | | | | | |
| Montana: | | | | | | | | | | | | |
| Billings | 0 | 0 | ------ | 0 | ------ | 0 | 2 | 0 | 0 | 0 | 0 | ------ |
| Great Falls | 0 | 0 | ------ | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 0 | ------ |
| Helena | 0 | 0 | ------ | 0 | ------ | 0 | 1 | 0 | 0 | 0 | 0 | ------ |
| Missoula | 0 | 0 | ------ | 0 | ------ | 0 | 2 | 1 | 1 | 0 | 0 | 3 |
| Idaho: | | | | | | | | | | | | |
| Boise | 0 | 0 | ------ | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | ------ |
| Colorado: | | | | | | | | | | | | |
| Denver | 1 | 0 | 6 | 0 | 2 | 0 | 5 | 0 | 4 | 0 | 0 | 7 |
| Pueblo | 0 | 0 | ------ | 0 | ------ | 0 | 0 | 3 | 3 | 0 | 0 | ------ |
| Utah: | | | | | | | | | | | | |
| Salt Lake City | 0 | 0 | ------ | 0 | 3 | 0 | 0 | 1 | 4 | 0 | 0 | 1 |

*City reports for week ended October 19, 1946*—Continued

| Division, State, and City | Diphtheria cases | Encephalitis, infectious, cases | Influenza | | Measles cases | Meningitis, meningococcus, cases | Pneumonia deaths | Poliomyelitis cases | Scarlet fever cases | Smallpox cases | Typhoid and paratyphoid fever cases | Whooping cough cases |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Cases | Deaths | | | | | | | | |
| PACIFIC | | | | | | | | | | | | |
| Washington: | | | | | | | | | | | | |
| Seattle | 1 | 0 | ------ | 0 | 2 | 0 | 2 | 2 | 0 | 0 | 0 | 2 |
| Spokane | 0 | 0 | ------ | 0 | 1 | 0 | 0 | 3 | 1 | 0 | 0 | 2 |
| Tacoma | 0 | 0 | ------ | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | ------ |
| California: | | | | | | | | | | | | |
| Los Angeles | 5 | 0 | 1 | 1 | 3 | 1 | 2 | 11 | 20 | 0 | 1 | 7 |
| Sacramento | 1 | 0 | ------ | 0 | ------ | 0 | 1 | 0 | 0 | 0 | 0 | ------ |
| San Francisco | 0 | 0 | ------ | 0 | 3 | 0 | 7 | 0 | 7 | 0 | 0 | 7 |
| Total | 68 | 2 | 24 | 8 | 208 | 19 | 225 | 252 | 316 | 0 | 18 | 496 |
| Corresponding week, 1945 | 93 | ------ | 42 | 11 | 268 | ------ | 274 | ------ | 547 | 0 | 14 | 666 |
| Average, 1941–45 | 86 | ------ | 57 | [1] 16 | [2] 290 | ------ | [1] 304 | ------ | 519 | 0 | 23 | 774 |

[1] 3-year average, 1943–45
[2] 5-year median, 1941–45

*Dysentery, amebic.*—Cases: Buffalo 1; New York 2; Rochester 1; St. Paul 1; St. Louis 1.
*Dysentery, bacillary.*—Cases: Providence 1; New York 9; Charleston, S. C., 1; Los Angeles 3.
*Dysentery, unspecified.*—Cases: Cincinnati 2; San Antonio 6.
*Typhus fever, endemic.*—Cases: Charleston, S. C., 1; Atlanta 1; Tampa 1; Mobile 1; Little Rock 1; New Orleans 4; Galveston 1; Houston 1; San Antonio 1; Los Angeles 3.

*Rates (annual basis) per 100,000 population, by geographic groups for the 87 cities in the preceding table (estimated population, 1943, 34,237,200)*

| | Diphtheria case rates | Encephalitis, infectious, case rates | Influenza | | Measles case rates | Meningitis, meningococcus, case rates | Pneumonia death rates | Poliomyelitis case rates | Scarlet fever case rates | Smallpox case rates | Typhoid and paratyphoid fever case rates | Whooping cough case rates |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Case rates | Death rates | | | | | | | | |
| New England | 5.3 | 0.0 | 0.0 | 0.0 | 110 | 5.3 | 49.9 | 99.8 | 50 | 0.0 | 0.0 | 171 |
| Middle Atlantic | 9.7 | 0.5 | 1.9 | 1.4 | 19. | 2.3 | 28.2 | 20.8 | 25 | 0.0 | 1.9 | 44 |
| East North Central | 3.0 | 0.6 | 4.3 | 1.8 | 40 | 3.0 | 31.6 | 40.7 | 79 | 0.0 | 2.4 | 153 |
| West North Central | 26.1 | 0.0 | 2.0 | 0.0 | 6 | 8.0 | 42.2 | 116.6 | 74 | 0.0 | 0.0 | 16 |
| South Atlantic | 6.8 | 0.0 | 8.5 | 0.0 | 56 | 1.7 | 34.0 | 8.5 | 46 | 0.0 | 6.8 | 71 |
| East South Central | 41.3 | 0.0 | 0.0 | 0.0 | 18 | 0.0 | 94.4 | 23.6 | 41 | 0.0 | 17.7 | 12 |
| West South Central | 23.0 | 0.0 | 0.0 | 2.9 | 0 | 2.9 | 40.2 | 37.3 | 3 | 0.0 | 5.7 | 6 |
| Mountain | 7.9 | 0.0 | 47.7 | 0.0 | 71 | 0.0 | 79.4 | 39.7 | 103. | 0.0 | 0.0 | 87 |
| Pacific | 11.1 | 0.0 | 1.6 | 1.6 | 17 | 1.6 | 19.0 | 26.9 | 44 | 0.0 | 1.6 | 28 |
| Total | 10.4 | 0.3 | 3.7 | 1.2 | 32 | 2.9 | 34.4 | 38.5 | 48 | 0.0 | 2.7 | 76 |

## TERRITORIES AND POSSESSIONS

### Panama Canal Zone

*Notifiable diseases—August 1946.*—During the month of August 1946, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities, as follows:

| Disease | Panama | | Colon | | Canal Zone | | Outside the Zone and terminal cities | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Cases | Deaths | Cases | Deaths | Cases | Deaths | Cases | Deaths | Cases | Deaths |
| Chickenpox | 3 | | 1 | | 1 | | 2 | | 7 | |
| Diphtheria | 11 | | 2 | | 5 | | 3 | | 21 | |
| Dysentery: | | | | | | | | | | |
| Amebic | 2 | | | | | | 1 | | 3 | |
| Bacillary | 4 | | 1 | | | | 5 | | 10 | |
| Leprosy | | | | | | | | 1 | | 1 |
| Malaria[1] | 8 | | 2 | | 47 | 1 | 52 | 3 | 109 | 4 |
| Measles | 83 | 11 | 11 | | 57 | | 54 | 1 | 205 | 12 |
| Mumps | | | | | 14 | | 1 | | 15 | |
| Paratyphoid fever | 1 | | | | | | 2 | | 3 | |
| Pneumonia | | 21 | | 2 | 79 | | | 3 | [2] 79 | 26 |
| Scarlet fever | | | | | 1 | | | | 1 | |
| Tuberculosis | | 18 | | 4 | 3 | 3 | | 6 | [2] 3 | 31 |
| Typhoid fever | 1 | | | | | | 1 | 3 | 2 | 3 |
| Whooping cough | | | | 1 | 2 | | | | [2] 2 | 1 |

[1] 18 recurrent cases.
[2] In the Canal Zone only.

### Virgin Islands of the United States

*Notifiable diseases—July–September 1946.*—During the months of July, August, and September 1946, cases of certain notifiable diseases were reported in the Virgin Islands of the United States as follows:

| Disease | July | August | September | Disease | July | August | September |
|---|---|---|---|---|---|---|---|
| Filariasis | 5 | | 6 | Schistosomiasis | | 1 | |
| Gonorrhea | 10 | 15 | 6 | Syphilis | 15 | 13 | 12 |
| Hookworm disease | | 3 | 3 | Tetanus | 1 | | |
| Leprosy | | 1 | | Tuberculosis (respiratory) | 2 | 2 | 2 |
| Lymphogranuloma venereum | 2 | | | Typhoid fever | 5 | 2 | 2 |
| Paratyphoid fever | | 1 | 1 | Typhus fever (murine) | 1 | | |
| Poliomyelitis | 3 | | | | | | |

## DEATHS DURING WEEK ENDED OCT. 19, 1946

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

| | Week ended Oct. 19, 1946 | Corresponding week, 1945 |
|---|---|---|
| Data for 91 large cities of the United States: | | |
| Total deaths | 8,606 | 9,311 |
| Average for 3 prior years | 8,919 | |
| Total deaths, first 42 weeks of year | 374,252 | 370,433 |
| Deaths under 1 year of age | 742 | 615 |
| Average for 3 prior years | 607 | |
| Deaths under 1 year of age, first 42 weeks of year | 26,865 | 25,013 |
| Data from industrial insurance companies: | | |
| Policies in force | 67,321,559 | 67,299,160 |
| Number of death claims | 10,263 | 12,623 |
| Death claims per 1,000 policies in force, annual rate | 7.9 | 9.8 |
| Death claims per 1,000 policies, first 42 weeks of year, annual rate | 9.5 | 10.1 |

# FOREIGN REPORTS

## CANADA

*Provinces—Communicable diseases—Week ended October 5, 1946.*—During the week ended October 5, 1946, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

| Disease | Prince Edward Island | Nova Scotia | New Brunswick | Quebec | Ontario | Manitoba | Saskatchewan | Alberta | British Columbia | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Chickenpox | | 6 | | 53 | 99 | 30 | 7 | 39 | 93 | 327 |
| Diphtheria | 2 | 2 | 2 | 38 | 10 | 8 | | | | 62 |
| Dysentery, bacillary | | | | | 1 | | | | | 1 |
| Encephalitis, infectious | | | | | | 1 | | | | 1 |
| German measles | | | | | 6 | | 1 | 3 | 4 | 14 |
| Influenza | | | | | 10 | 2 | | | | 12 |
| Measles | | 16 | | 91 | 97 | 30 | 46 | 32 | 6 | 318 |
| Meningitis, meningococcus | | | | 1 | 1 | | | | | 2 |
| Mumps | | | | 26 | 148 | 33 | 50 | 30 | 69 | 356 |
| Poliomyelitis | 7 | 2 | 6 | 38 | 26 | 1 | 1 | | 3 | 84 |
| Scarlet fever | | 14 | 2 | 66 | 24 | 17 | 1 | 8 | 8 | 140 |
| Tuberculosis (all forms) | | 1 | 13 | 121 | 42 | 38 | 1 | 31 | 54 | 301 |
| Typhoid and paratyphoid fever | | | | 18 | 2 | 1 | | 1 | 2 | 24 |
| Undulent fever | | | | 2 | 3 | | | 2 | 1 | 8 |
| Venereal diseases: | | | | | | | | | | |
| Gonorrhea | 6 | 17 | 8 | 67 | 131 | 58 | 46 | 43 | 61 | 437 |
| Syphilis | 3 | 9 | 5 | 111 | 65 | 14 | 8 | 13 | 37 | 265 |
| Other forms | | | | 7 | | | | | 1 | 8 |
| Whooping cough | | 12 | | 90 | 56 | 4 | 20 | 4 | 1 | 187 |

## CUBA

*Habana—Communicable diseases—4 weeks ended October 12, 1946.*—During the 4 weeks ended October 12, 1946, certain notifiable diseases were reported in Habana, Cuba, as follows:

| Disease | Cases | Deaths | Disease | Cases | Deaths |
|---|---|---|---|---|---|
| Diphtheria | 9 | | Scarlet fever | 1 | |
| Malaria | 21 | | Tuberculosis | 5 | 6 |
| Measles | 8 | | Typhoid fever | 24 | 1 |
| Poliomyelitis | 1 | | | | |

*Provinces—Notifiable diseases—4 weeks ended October 5, 1946.*—During the 4 weeks ended October 5, 1946, cases of certain notifiable diseases were reported in the Provinces of Cuba, as follows:

| Disease | Pinar del Rio | Habana[1] | Matanzas | Santa Clara | Camaguey | Oriente | Total |
|---|---|---|---|---|---|---|---|
| Cancer | 3 | 13 | 12 | 8 | 1 | 18 | 55 |
| Diphtheria | 1 | 13 | 4 | | | | 17 |
| Hookworm disease | | | | 3 | | | 3 |
| Leprosy | | 3 | | | 1 | | 4 |
| Malaria | 6 | 13 | | | 3 | 40 | 62 |
| Measles | 1 | 7 | 1 | 1 | 2 | 12 | 24 |
| Poliomyelitis | 6 | 4 | | 5 | 2 | | 17 |
| Scarlet fever | | 1 | | | | | 1 |
| Tuberculosis (respiratory) | 10 | 18 | 35 | 23 | 40 | 41 | 167 |
| Typhoid fever | 106 | 45 | 9 | 19 | 21 | 41 | 241 |
| Whooping cough | | 1 | | | | | 1 |
| Yaws | | | | | | 2 | 2 |

[1] Includes the city of Habana.

## JAPAN

*Notifiable diseases—4 weeks ended September 21, 1946, and year to date.*—During the 4 weeks ended September 21, 1946, and the year to date, cases of certain notifiable diseases were reported in Japan as follows:

| Disease | 4 weeks ended Sept. 21, 1946 | Total cases reported for the year to date | Disease | 4 weeks ended Sept. 21, 1946 | Total cases reported for the year to date |
|---|---|---|---|---|---|
| Cerebrospinal meningitis | 92 | 1,203 | Paratyphoid fever | 1,307 | 6,900 |
| Cholera | 303 | 1,185 | Scarlet fever | 134 | 1,416 |
| Diphtheria | 2,852 | 34,823 | Smallpox | 13 | 17,655 |
| Dysentery | 22,895 | 62,638 | Syphilis | 7,525 | 48,503 |
| Encephalitis, Japanese "B" | 37 | [1] 140 | Typhoid fever | 4,782 | 35,463 |
| Gonorrhea | 12,643 | 86,184 | Typhus fever | 87 | 30,708 |
| Malaria | 4,835 | [1] 20,245 | | | |

[1] For the period June 2, 1946 to date.

## REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during recent months. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

### Cholera

*China.*—Cholera has been reported in certain provinces of China as follows: Chekiang Province—August 21–31, 1946, 72 cases, 7 deaths, September 1–10, 1946, 104 cases, 3 deaths, September 11–20, 1946, 235 cases, 27 deaths; Honan Province—August 21–31, 1946, 191 cases, 21 deaths, September 1–10, 1946, 106 cases, 9 deaths; Hunan Province—September 1–10, 1946, 178 cases, 28 deaths, September 11–20, 1946, 193 cases, 32 deaths; Kwangtung Province—August 21–31, 1946, 73 cases, 26 deaths, September 1–10, 1946, 135 cases, 67 deaths.