Public Health Reports

Vol. 66 • JUNE 8, 1951 • *No. 23*

Weight Control—A Simplified Concept

By A. L. CHAPMAN, M. D.*

Sevringhaus defines obesity in this manner: "Obesity is an excess of fat over the normal expected for the height, age, and sex . . ." (*30*). In all but a very small percentage of overweight people, the condition is brought about through a combination of overeating and inactivity (*23*).

Each generation has to rediscover these basic facts. Each generation exhibits some new concept of obesity which represents an attempt to avoid the harsh fact that only by prolonged re-education of obese people can normal eating habit patterns be restored and obesity ended.

The prevalence of obesity is high. A study of obese employees of the Metropolitan Life Insurance Co. in 1931 provided one clear indication of this fact (*13*). Out of 7,530 home office employees, 558 (7.4 percent) were 20 percent or more overweight. One hundred and twenty persons (1.6 percent) were 40 percent overweight. These were approximately the same percentages found among policyholders.

In 1939, a study of physical impairments among 10,000 unselected examinees for life insurance disclosed that approximately 28 percent of this group were 10 percent or more overweight (*12*). Obesity was the most frequent physical abnormality found. These findings of 10 and 20 years ago are confirmed by the results of recent studies. A Boston report of the examination of 3,000 "apparently well" adults in a health protection clinic showed that 18 percent were 20 percent or more above their optimum weight (*28*). The weighing and measuring of 562 persons who attended the annual meeting of the American Public Health Association in St. Louis in 1950 revealed that 40 percent of the men and 20 percent of the women were 10 percent or more above the ideal weight for persons of medium frame in their height range.

The prevalence of serious obesity (10 percent above average weight for sex and height) tends to increase directly with age. Dublin first reported this fact in 1925 after physical examinations of 16,662 male

*Regional Medical Director, Region III, Public Health Service, Federal Security Agency.

policyholders in the Metropolitan Life Insurance Co. (*7*). The prevalence at age 25 was found to be 4.9 percent, and at age 55 it had increased to 19.8 percent.

Study after study has shown that the mortality rates among obese people are higher than among people of normal weight. Overweight tends to shorten life. As early as 1930, Dublin had shown that 50 pounds of excess weight at age 50 increased the death rate by 56 percent—1 percent per pound—and that in those who were 100 pounds overweight the death rate was increased more than 100 percent (*8*). Even overweight persons accepted for life insurance have a mortality rate appreciably above that of their slimmer fellows (*21*).

That the rising risk from obesity increases with age (*8*) is pointed out by Joslin (*19*). He calculates that of ten fat men at age 30, six will survive to 60, three to 70, and perhaps one to 80. Of ten lean men, eight reach 60, five reach 70, and three will probably become octogenarians. This increased death rate is due primarily to the increased prevalence of the degenerative diseases in the overweight person.

Statistics published by the Metropolitan Life Insurance Co. in 1943 show that of men in whom diabetes began after the age of 35 more than 80 percent were overweight *before* the onset of the disease (*22*, *10*). These data also show that the death rate from diabetes among men 25 percent or more overweight is eight times as high as among average weight persons. Thus, diabetes and obesity are linked closely together.

During World War II, a small but interesting study of fatal coronary attacks in young soldiers showed that 73 (or 91 percent) of 80 young men between the ages of 20 and 36 who died of coronary arteriosclerosis were overweight. Only two were thin men (*15*). Obesity is known to play a harmful role in arthritis and other bone and joint diseases. Danoski states that arthritis is adversely affected by overweight (*6*). Dublin translates the bad effects of obesity on the cardiovascular system in terms that are easily understood. He states that 50 pounds overweight at age 45 impose as much extra mortality as does valvular heart disease (*9*). This is particularly significant in view of the emphasis which is being placed on the control of heart disease today.

Insurance studies have demonstrated that sustained hypertension occurs more than three times as often in overweight persons as in others (*26*); that the mortality from surgical procedures is higher in the overweight; and that the incidence of many other diseases and conditions is greater among the obese. Typical of these conditions are biliary tract disease, joint disease, intertrigo, varicose veins, and hernia (*29*). Even cancer (*9*) and accidents (*8*) are slightly more

likely to occur among the obese. The statistical evidence that highlights the adverse effect excess weight plays in our daily living continues to increase.

To date, great dependence has been placed on the dietary approach to weight control. Diets of all degrees of complexity have been distributed to fat people. The results from attempts to manage overweight patients by medication and dietary advice alone have been exceedingly poor (*1*, *5*, *6*, *16*, *18*, *24*, *27*, *29*).

Most fat people say that they are fat because they eat too much, and, to varying degrees, they attribute their difficulties in weight control to a deficiency in "will power." Analysis of 200 questionnaires filled out by applicants for admission to groups in a pilot study for weight control in Boston showed that 145 persons (72.5 percent) indicated overeating as a major cause of their excess weight; 142 (71 percent) had tried to control their weight previously and had failed; and 98 (67.5 percent) had an inkling that their overeating had an emotional or psychological basis (*17*). One thing apparently had been lacking among these people—motivation to lose excess weight.

In an article entitled, "Psychological Aspects of Obesity," Hilde Bruch makes this illuminating observation, "In those happy-go-lucky fat people whom I have had the opportunity to observe, the joviality and often boisterous cheerfulness was nothing but a thin veneer put on for the benefit of the public, a compensatory defense against underlying feelings of unhappiness and futility" (*4*).

In other words, fat people simply are not happy. They employ a camaraderie reactive defense mechanism unconsciously designed to mask their underlying tenseness, frustration, and uncertainty. It is this underlying tension, this lack of emotional equilibrium, this desire to achieve satisfaction in an unsatisfactory life, that drives the overweight to overindulgence in food. They seek comfort in overeating in the face of failure and of frustrating experience.

Freed has stated that "psychologic drives are paramount, since the tendency to overeat is a strong drive for oral gratification and that any nervous or psychic tension of the person will cause an aggravation of this tendency." He feels that "treatment should be based on an understanding of the psychologic factors" (*14*). In this opinion, he is supported by Charlotte Babcock who agrees that food is frequently used by some individuals for purposes other than physiological (*2*).

Richardson feels that obesity often may be regarded as the physical expression of a neurosis and that, with several notable exceptions, there is little basis for the theory of obesity being associated with endocrine disturbances (*25*). He concludes that obesity can be regarded as a component of a neurosis, the physical expression of which is the accumulation of fat.

Another authority in agreement with the psychological approach to

obesity control is Nicholson, who concludes "that psychotherapy and the re-establishment of proper dietary habits are essential for permanent weight reduction" (*24*). In one study, he treated 93 private medical clinic patients for obesity, 38 of whom received only psychotherapy. After a year or more there were 26 successes and 12 failures. Thirty-five were treated by diet therapy alone; in this group there were nine successes and 26 failures. None of the 20 patients who receive amphetamine sulfate or thyroid alone maintained a weight reduction.

Normally, appetite decreases when activity is limited. There appears to be no physiological reason, therefore, why obese people should overindulge in food. The cause of this overindulgence must be looked for elsewhere than in the field of physiology. The failure of medication and diet therapy to control obesity on a long-term basis could be predicated on the fact that obesity is not entirely the result of aberrant physiology.

A strong case for the psychological basis for obesity has been made by several investigators. Bayles points out some of the nonmetabolic satisfactions derived from food (*3*). Among these is simple gratification of a need for pleasure. To those men who were once poor and hungry, plenty of good food may symbolize success. To a bored housewife, food may represent diversion. To those with social ambitions, overeating may become the price paid for social acceptance. Food may even substitute for love; and it definitely has been shown to relieve tension, at least temporarily.

Since the obese person obviously eats more than his body has normal need for, it seems logical to look for the basic cause of obesity among the nonmetabolic, nonnutritional, or psychological and emotional reasons for overeating.

If we accept the thesis that overweight is a condition that most frequently stems from psychological factors, we face the problem of how to approach the obese individual for the purpose of controlling his obesity. Obviously advice, diets, and prescriptions will not serve to change the often chronically maladjusted habit patterns that exist. The obese person has to be motivated to want to be thin and to want to stay thin.

One method of utilizing psychotherapy is on a group basis. This may provide a practical method of offering assistance in meeting the needs of the 30,000,000 people in this country who are estimated to be 10 percent overweight, or even the 15,000,000 people whose excess weight exceeds 20 percent.

Speaking of short-term group psychotherapy, Kotkov points out that the group psychotherapist acts as a "catalytic agent" of the group. Every now and then he emerges from the background and helps to release the powerful emotional potential present in the group.

From the observations and conclusions of many workers in the field of weight control, typified by those cited above, the following basic concepts emerge:

1. The prevalence of obesity in the United States is high.
2. Obesity is associated with an increased death rate.
3. Obesity is associated with an increased prevalence of and death rate from the degenerative diseases.
4. Attempts to control obesity on a long-term basis through a nutritional approach have not been widely successful.
5. There is substantial evidence that frequently obesity is not only a nutritional problem, but a psychological problem as well.
6. Individual psychotherapy has been shown in limited experiments to be effective in weight control, but only the group approach is practical if large numbers of obese people are to be benefited.
7. The crux of the control problem is to motivate people to want to be thin and to want to stay thin.

In formulating an exploratory weight-control program in Boston in cooperation with the Boston Dispensary and the Massachusetts State Health Department, these seven basic concepts were applied by the Public Health Service.

The first announcement that groups were to be formed to help people who had not been able to lose weight through their own efforts brought a deluge of phone calls and letters from more than 200 applicants. Admission to these groups was predicated on two requirements: the approval of the private physician concerned, and a true desire on the part of the applicant to lose weight. As an experimental project, the groups—nine in all—met weekly for a period of 16 weeks.

One of the most important accomplishments among the members of these groups has been the reassurance that weight reduction can be achieved. Most applicants had tried unsuccessfully to follow diets. Some had taken reducing drugs, and some had subscribed to various fads. Most of them had lost faith in the idea that weight reduction, for them, was possible.

The group leaders who have served thus far have come from different backgrounds and have possessed different types of skills. Two were psychologists, two were teachers, one was a psychiatrist, two were nutritionists, one was a minister, two were physicians, and one was a graduate student in psychology.

Group leaders have been selected on the basis of their experience and interest in group leadership. The first of these groups was supported through the use of cooperative funds. The group leader seems to hold the key to the success or failure of these groups. Although he remains pretty much in the background, it is he who adroitly keeps discussion alive, fosters audience participation, and serves as a "catalyst" (*20*).

Nutritional advice has been made available to the members of each group as they have felt the need for help and have requested it.

Following the completion of the 16-week course, many of the group members have continued to meet on an informal, intermittent basis. Arrangements for group leaders, space, and other facilities have been made to encourage continuation of these meetings.

Studies of the method can be developed at minimal expense by local health departments and other agencies that may be concerned with problems of public health.

Although this group approach to weight control is still exploratory, it appears to be based upon sound principles. The effective development of this economical method of mass application of sound weight control principles may do much to lessen obesity throughout the Nation.

REFERENCES

(1) Albrecht, Frederick K.: The use of benzedrine sulfate in obesity. Ann. Int. Med. **21**: 983–989 (1944).

(2) Babcock, Charlotte G.: Food and its emotional significance. J. Am. Dietet. Assoc. **24**: 390–393 (1948).

(3) Bayles, Spencer: Psychiatric contributions to the treatment of obesity. Am. J. Med. Sc. **219**: 104–107 (1950).

(4) Bruch, Hilde: Psychological aspects of obesity. Bull. New York Acad. Med. **24**: 73–86 (1948).

(5) Colton, N. H., Segal, H., II, Sternberg, A., Sheekter, F. R., and Pastor, N.: The management of obesity with emphasis on appetite control. Am. J. Med. Sc. **206**: 75–86 (1943).

(6) Danowski, T. S., and Winkler, A. W.: Obesity as a clinical problem. Am. J. Med. Sc. **208**: 622–630 (1944).

(7) Dublin, L. I., Fisk, E. L., and Kopf, E. W.: Physical defects as revealed by periodic health examinations. Am. J. Med. Sc. **170**: 576–594 (1925).

(8) Dublin, L. I.: The influence of weight on certain causes of death. Human Biol. **2**: 159–184 (1930).

(9) Dublin, L. I., and Lotka, A. J.: Length of Life. New York, Roland Press Co., 1936.

(10) Dublin, L. I., and Lotka, A. J.: Twenty-five Years of Health Progress. New York, Metropolitan Life Insurance Co., 1937.

(11) Dublin, L. I., Lotka, A. J., and Spiegelman, M.: Length of Life. New York, Roland Press, 1949.

(12) Editorial: A study of impairments found among 10,000 unselected examinees. II. Weight. Proc. Life Ext. Exam. **1**: 89–93 (1939).

(13) Fellows, H. H.: Studies of relatively normal obese individuals during and after dietary instruction. Am. J. Med. Sc. **181**: 301 (1931); **182**: 49 (1931).

(14) Freed, S. Charles: Psychic factors in the development and treatment of obesity. J. A. M. A. **133**: 369–374 (1947).

(15) French, A. J., and Dock, W. M.: Fatal coronary arteriosclerosis in young soldiers. J. A. M. A. **124**: 1233 (1944).

(16) Galvin and McGavach: Dexedrine and weight reduction. New York State Education J. **49**: 279 (1949).

(17) Grant, Marjorie, and Rosenthal, J.: Group psychotherapy for weight control. Massachusetts Health J. **31**: 8, 9 (May 1950).

(18) Gray, Horace, and Kallenbach, Dorothy: Obesity treatments: Results on 212 outpatients. J. Am. Dietet. Assoc. **15**: 239–245 (1939).

(19) Joslin, Elliott P.: A Dietetic Manual. Philadelphia, Lea and Febiger, 1937.

(20) Kotkov, Benjamin: Technique and explanatory concepts of short-term group psychotherapy. J. Psychol. **28**: 369–381 (1949).

(21) Metropolitan Life Insurance Company: Ideal weights for men. Stat. Bull. **24**: 6–8 (June 1943).

(*22*) Metropolitan Life Insurance Company: Ideal weights for women. Stat. Bull. **24**: 6–8 (June 1943).
(*23*) Jolliffe, N., Tisdal, F. F., and Cannon, Paul L.: Clinical Nutrition. Edited for the Food and Nutrition Board of the National Research Council (Hoeber Book). New York, Harper Bros. 1950, 925 pp.
(*24*) Nicholson, William M.: Emotional factors in obesity. Am. J. Med. Sc. **211**: 443–447 (1946).
(*25*) Richardson, Henry B.: Obesity as a manifestation of neurosis. Med. Clin. North America (Boston Number) **30**: 1187–1202 (1946).
(*26*) Robinson, Samuel C.: Hypertension and obesity. J. Lab. and Clin. Med. **25**: 807–822 (1940).
(*27*) Rony, H. R.: Obesity and Leanness. Philadelphia, Lea and Febiger, 1940, 300 pp.
(*28*) Ryder, Claire F., and Gedding, Vlado A.: Preliminary report on the Health Protection Clinic. New England J. Med. **243**: 277 (1950).
(*29*) Rynearson, Edw. H., and Gastineau, Clifford F.: Obesity. Springfield, Ill., Chas. C. Thomas, 1949.
(*30*) Sevringhaus, E. L.: Endocrine Therapy in General Practice. Ed. 5. Chicago, The Year Book Publishers, Inc., 1945.

944592—51——2

Sources of Morbidity and Mortality Material in Industrial Health

By Victoria M. Trasko*

Our need for morbidity and mortality statistics is aptly summarized in the familiar quotation that appears in Public Health Reports—"No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring." Applicable in those early days of what we came to call "communicable disease consciousness," these words still hold true for the many new public health programs that since have come into prominence and that, to a lesser or greater degree, have been dependent on the life blood of reports—or to use a broader term, statistics. Among these programs, industrial hygiene in the past decade or two has witnessed a spurt of growth which may be largely attributable, in one sense, to the evidence furnished by statistics.

Attention was first directed to this field through facts uncovered in the early pioneering general sickness surveys as well as studies of occupational diseases. The information brought to light the interest of governmental and other agencies in conducting research and in helping industry to raise the health level of the worker and to improve working conditions. As a result, today, we have official industrial hygiene agencies in practically every State and in a dozen local jurisdictions. They employ over 500 professional workers whose basic function is the evaluation and elimination of health hazards in industry. Unknown numbers are also employed by private industry and nonofficial groups.

Because of the changing nature of American industry—changing technological processes as well as labor turnovers—the job of industrial hygiene personnel is a demanding one. In carrying out his work, the industrial hygienist must be alert to any development—whether it be a new instrument, a new technique, or new data—that will help him.

A frank appraisal reveals that there is little recent, or, as a matter of fact, old material on industrial morbidity and mortality statistics in this country (*1*). The knowledge we have of the apparent effect of the occupation and the working environment on the health of workers, especially when coupled with socioeconomic factors, was

* Public Health Adviser, Division of Industrial Hygiene, Public Health Service.

handed down years ago. This lack of up-to-date information is a serious obstacle, particularly in determining the effectiveness of control programs initiated since that time.

Since the industrial hygienist is concerned in his proper total attitude, first, with the control of occupational disease hazards and, second, with the maintenance of the complete health of the worker, he is interested primarily in data on three basic types of disabilities: occupational diseases, occupational accidents, and nonoccupational illness.

Occupational Diseases

In carrying out his primary responsibility—the investigation and prevention of occupational diseases—the industrial hygienist must seek information on the prevalence and causes of occupational disease in order that he may effectively plan and evaluate control measures. Current information, however, is scanty and consists of officially reported cases, data uncovered in scientific studies of industrial health hazards, and independent accounts of disease experiences.

The official reporting requirements vary from State to State. Today we find that occupational diseases are reportable by physicians to health departments in 24 States and to labor departments in 2 States. In 12 States, workmen's compensation laws carry separate provisions requiring that reports be made to the compensation authority by employers, and sometimes by physicians. In the 28 other States that provide compensation for disability from occupational diseases, the reporting is implied in the filing of claims or is subject to the same conditions as reporting of "injuries." Thus, in some States, reporting is mandatory to two separate agencies. Only three States in this country have no reporting requirements whatsoever.

Yet, this seeming abundance of information is deceptive, for closer analysis reveals that both the extent and character of the reporting are usually disappointing. In fact, one is forced to the conclusion that occupational disease reporting, even when backed by compensation requirements, in reality is much more unsatisfactory than communicable disease reporting. Difficulties lie not only in the methods of reporting and in ineffective enforcement, but also in the lack of uniform criteria for an acceptable definition of occupational diseases as contrasted with injuries, and in recognition of such diseases by practicing physicians.

Because of the paucity of the data, the reports do not lend themselves to statistical analysis other than an enumeration by cause and number. Listings of all cases coming to the attention of official industrial hygiene divisions are usually included in their annual reports of activities. The Industrial Hygiene Foundation of Pittsburgh also publishes summaries for a few States in its monthly Industrial Hygiene Digest. Notable among the few States providing more comprehensive

data, the California Department of Industrial Relations refers to the Bureau of Adult Health between 12,000 and 15,000 "first" reports of occupational diseases a year reported by physicians attending injured workers. The Bureau analyzes the reports annually and publishes the results in its Occupational Health Bulletin.

Published reports of compensation authorities provide some information on occupational diseases, but this is chiefly in reference to their compensability. Consequently, they are not truly suitable for statistical evaluations of disease prevalence. Occupational diseases are sometimes listed separately, but more commonly they are lumped into one group or combined with "injuries."

By far a more significant source of material on industrial morbidity lies in the reports of scientific studies of health hazards in industry. Such studies have been made during the past 35 years by the Public Health Service in cooperation with other Federal and State agencies, and by some State industrial hygiene divisions. Among the better-known ones, for example, is the series of some 15 studies of workers in the dusty industries which have been made during the past 20 years. In addition to the evaluation of the working environment as a causative factor in disease, the published reports give data on the general physical condition of the workers and on the prevalence of any and all occupational diseases, and of other diseases, such as affections of the respiratory system, as determined by the physical examination. Data are frequently included on the nature and severity of disabling illness, and on occupational mortality. Each study represents a careful and detailed observation of at least 1,000 persons.

A complete list of such studies may be found in the published bibliographies of the Public Health Service (*2*, *3*). In reality these studies offer the best sources of industrial morbidity material we have in this country. They are statistically sound, and scientifically they point up the gravity of the occupational disease problem typical of the industry under study—such as anthracosilicosis among hard coal miners, lead poisoning among storage battery workers, silicosis among granite workers, and so on.

The third source of material on occupational diseases consists of the many published accounts of the occurrence of isolated cases and specific disease (*4–12*). These accounts deal chiefly with clinical and preventive aspects and are not productive of any quantitative morbidity data. Along with reviews of the literature, they provide valuable and abundant information for the industrial hygienist on the actual occurrence of diseases, their causes, treatment and control, as well as the results of research and toxicological investigations. To some extent, then, limitations in statistical material are offset by the scientific knowledge thus gained of specific diseases.

Also worthy of mention are the few epidemiological studies of the

incidence of single diseases. One of these reports is the Public Health Service study of 32,000 cases of dermatitis reported by seven States during 1938–43 (*13*). The anthrax problem has also been the subject of several reports, one of which is the 20-year survey of anthrax in the United States by the Committee on Industrial Anthrax of the Industrial Hygiene Section of the American Public Health Association (*14*); another is the epidemiological study of anthrax in Philadelphia's industries reported during 1931–40 (*15*). The Public Health Service also completed recently a study of the problem (*16*). These and similar reports (*17*, *18*), few in number, are typical of the sources of quantitative material on occupational diseases in this country.

Sickness Absenteeism

In carrying out the second objective of an industrial health program, that of maintaining the total health of the worker, the industrial hygienist becomes concerned with illness common to the general population. These nonoccupational illnesses account for the great bulk of sickness absenteeism in industry, exacting an estimated toll of 400 to 500 million man-days annually. This loss of time from work because of general illnesses, such as respiratory diseases, digestive disorders, and certain chronic diseases, is many times greater than the total amount of time lost from accidents and occupational diseases combined. Thus, absence from work due to general illness is recognized as one of the most important problems with which industry as well as the industrial hygienist has to cope.

An over-all picture of sickness is found in the sickness surveys of the general population. They are of interest to the industrial hygienist in that they furnish fundamental evidence on the apparent influence of the occupation and socioeconomic factors on the general health of the worker. Familiar surveys made in the past, whose findings bear on the prevalence of disabling illness, are the early Hagerstown studies (*19*), the Committe on Costs of Medical Care Survey of 9,000 families in 1928–31 (*20*), the National Health Survey of 1935–36 (*21*), the Baltimore Chronic Diseases Study (*22*), and the Census Bureau's population survey of 25,000 families of February 1949 (*23*) which ascertained the amount of disability on the day of enumeration and was repeated in September 1950.

Narrowing down the picture to studies of the industrial population, analyses of records of sick benefit and group insurance organizations and, to a limited extent, records of plant medical departments furnish the industrial hygienist with more usable data on sickness experience. Even from these sources, however, statistics of only a general informative nature are obtainable. The analysis of such records is confined to a very few agencies (*1*, *2*, *3*, *24*, *25*) and companies in this country, of which the Public Health Service is one.

The Division of Industrial Hygiene of the Public Health Service has been collecting and analyzing sickness records of a group of sick benefit organizations since about 1920. Results of the analyses of these records on duration and cause of disabling illness for the reporting companies are published periodically, and, as time permits, special reports are issued. Since 1936, for example, close to 100 reports have been published by the Public Health Service on this subject (*2*, *3*). These reports reveal trends in incidence of specific diseases, such as respiratory affections, and the chronic diseases, and afford some knowledge of the success being made in their control.

The American College of Surgeons also published limited statistics on the amount of time lost from sickness of all kinds (*26*). Their information is based on reports collected from several hundred companies keeping such records.

Morbidity material of most practical use to the industrial hygienist, however, is found in disability statistics of individual companies. Unfortunately, only a few large companies and organizations analyze their own sickness experience and publish results in professional journals (*27–32*). Sickness statistics of this type are valuable, for they provide a definitive picture of occupational health problems of the plant at a given time. In this way, specific health problems can be determined and the effectiveness of the plant health program may be evaluated.

The official industrial hygiene agencies themselves are limited as a source of material. Two State health departments—Tennessee and New Hampshire—currently collect and analyze reports of sickness absenteeism for a small group of industries in their areas. Several other States collected such reports in the past but no longer do so because of pressure of other work and personnel shortages.

Occupational Accidents

Two other types of materials on morbidity and mortality remain for brief comment—occupational accidents and mortality statistics. Accident statistics are important criteria to the industrial hygienist in determining the extent and nature of industrial health and safety problems.

The most fruitful sources of accident data in this country are the United States Bureau of Labor Statistics and the National Safety Council. Quarterly reports on injury rates in manufacturing industries and separate reports of work-injury experiences of special industries are released by the Bureau of Labor Statistics (*33–35*). The National Safety Council (*36*) annually publishes injury frequency rates of reporting industries as well as information on causes of accidents.

Mortality Statistics

Industrial mortality statistics in this country are also meager. The most recent source on mortality rates according to broad groups of occupation is still the well-known publication of the National Tuberculosis Association of New York City, entitled Death Rates by Occupation (*37*, *38*), based on mortality statistics of 1930 in 10 States.

The Metropolitan Life Insurance Co. makes available from time to time proportionate mortality statistics by occupation for insured wage earners (*39*) and publishes monthly death rates from selected causes for industrial policyholders in its Statistical Bulletin. Occupational death rates are published in the Joint Occupation Study of the Actuarial Society and the Association of Life Insurance Medical Directors (*40*), but this study is chiefly from an actuarial point of view. An attempt to compile occupational mortality statistics on a State-wide basis from official death certificates is exemplified by the work of the Tennessee Department of Public Health (*41*).

The few sources of occupational mortality material available provide ample evidence that certain occupational groups experience excessive death rates from certain diseases. One notable example is the close relationship between tuberculosis of the respiratory system and occupations involving exposure to silica dust.

New Sources of Material

In view of the fragmentary nature of industrial morbidity and mortality statistics available in this country, the question then comes to one's mind: What attempts are being made to improve the present situation?

First, to meet the long-felt need for uniform and adequate reports of occupational diseases, the Division of Industrial Hygiene of the Public Health Service began in January 1950, a pilot study as the first step in ascertaining the feasibility of developing a Nation-wide collecting system. Ten States, each with various reporting practices, are participating in this 2-year study. The plan being tested calls for the industrial hygiene agencies in these States to transmit occupational disease information directly to the Division of Industrial Hygiene of the Public Health Service, which is serving as a central collection agency. It is hoped that the results of the 2-year study will furnish evidence on the fundamental nature of difficulties characteristic of current reporting practices and problems and offer data for setting up much needed criteria on reporting and diagnosing occupational diseases, and, to some extent, on prevalence statistics.

Second, the National Office of Vital Statistics is undertaking an occupational and industrial mortality study on the basis of the 1950

census data. This should fill the gap in our present knowledge on occupational mortality and provide industrial hygiene agencies with recent and usable data.

And finally, a potential source of current information on morbidity may eventually be found in the records kept in connection with State disability insurance programs under which the worker receives a cash benefit while he is unable to work because of illness. At the present time, laws are in operation in Rhode Island, California, New Jersey, and New York. There is a tendency in existing and proposed legislation of this type to make employers pay part of the cost of the insurance system. Faced with this cost, there is no doubt that companies will be more interested in establishing medical care programs for their workers and, consequently, in knowing the causes of disabling sickness. Success in utilizing disability insurance records of this type, particularly in ascertaining costs and incidence of illness, has been experienced by the Railroad Retirement Board during the 3 years of operation of its sickness benefit program (*42*).

In summary, we find that the industrial morbidity and mortality statistical picture is circumscribed by real limitations. These limitations, however, can be partly offset if they are understood and the available data used judiciously.

REFERENCES

(*1*) Klem, M. C., McKiever, M. F., and Lear, W. J.: Industrial Health and Medical Programs. A compilation of selected statements, tables, and charts. Public Health Service Pub. No. 15, Washington, U. S. Government Printing Office, 1950.

(*2*) Bellingham, E. F., Bloomfield, J. J., and Dreessen, W. C.: Bibliography of Industrial Hygiene, 1900–1943. A Selected List. Pub. Health Bull, No. 289, Washington, U. S. Government Printing Office, 1945.

(*3*) Publications by Industrial Hygiene Division and Other Public Health Service Publications, 1942–47, Inclusive. Division of Industrial Hygiene, Public Health Service, Federal Security Agency. (Mimeographed.)

(*4*) Spolyar, L. W., and Harger, R. N.: Arsine poisoning. Arch. Indust. Hyg. and Occup. Med. **1**: 419 (1950).

(*5*) MacMahon, H. E., and Olken, H. G.: Chronic pulmonary beryllosis in workers using fluorescent powders containing beryllium. Arch. Indust. Hyg. and Occup. Med. **1**: 195 (1950).

(*6*) Hardy, H. L., and Maloof, C. C.: Evidence of systemic effect of tetryl (with summary of available literature). Arch. Indust. Hyg. and Occup. Med. **1**: 545 (1950).

(*7*) Ingalls, T. H.: Incidence of cancer in the carbon black industry. Arch. Indust. Hyg. and Occup. Med. **1**: 662 (1950).

(*8*) Hueper, W. C.: Environmental and occupational cancer. Pub. Health Rep. Supp. 209, Washington, U. S. Government Printing Office, 1948.

(*9*) Grossman, C. M.: Lobar pneumonia in the shipbuilding industry: A review of 544 cases over a one-year period. J. Indust. Hyg. and Toxicol. **28**: 233 (1946).

(*10*) Hall, M. I., Lutz, E. F., and Patty, F. A.: Occupational dermatitis: Report of 368 cases. Connecticut Med. J. **10**: 187 (1946).

(*11*) De Nardi, J. M., Van Ordstrand, H. S., and Carmody, M. G.: Acute dermatitis and pneumonitis in beryllium workers: Review of 406 cases in 8-year period, with follow-up on recoveries. Ohio State Med. J. **45**: 567 (1949).

(*12*) McConnell, W. J., Flinn, R. H., and Brandt, A. D.: Occupational diseases in Government-owned ordnance explosives plants. Occup. Med. **1**: 551 (1946).

(13) Brinton, H. P., and Schwartz, L.: Dermatitis cases reported among workers in seven States. Indust. Med. **14:** 617 (1945).
(14) Smyth, H. F.: A 20-Year Survey of Anthrax in the United States. Sixth Report of the Committee on Anthrax, APHA. Symposium on anthrax, Pennsylvania Department of Health, April 1941.
(15) Fulton, W. B., Mellor, J. F., and Krecker, W. H. J.: An Epidemiological Study of Anthrax in Philadelphia. Symposium on anthrax, Pennsylvania Department of Health, April 1941.
(16) Wolff, A. H.: Industrial anthrax in the United States. Am. J. of Hyg., January 1951.
(17) Jordan, C. F.: Brucellosis in industry. Indust. Med. **17:** 176 (1948).
(18) Brown, E. W.: Health hazards from lead paint and zinc chromate plant. Occup. Med. **5:** 739 (1948).
(19) Sydenstricker, E.: Hagerstown morbidity studies 1921–24. Pub. Health Rep. **44:** 2101 (1929).
(20) Collins, S. D.: Incidence of illness and volume of medical services among 9,000 canvassed families. Nineteen papers in Pub. Health Rep. 1933–42, listed at end of paper in vol. 57, pp. 1635–1659, and four papers in Milbank Memorial Fund Quarterly for April 1937, January, April, and October, 1943.
(21) Public Health Service: National Health Survey. List of publications. Pub. Health Rep. **57:** 834 (1942). Reprint No. 2384.
(22) Collins, S. D., Phillips, F. R., and Oliver, D. S.: Specific causes of illness found in monthly canvasses of families. Sample of the Eastern Health District of Baltimore, 1938–43. Pub. Health Rep. **65:** 1235 (1950).
(23) Woolsey, T. D.: Estimates of disabling illness prevalence in the United States. Pub. Health Rep. **65:** 163 (1950).
(24) McElroy, F. S., and Moros, A.: Illness absenteeism in manufacturing plants, 1947. Monthly Labor Review **67:** 235 (1948).
(25) Kossoris, M. D.: Absenteeism and injury experience of older workers. Monthly Labor Review **67:** 16–19 (1948).
(26) Medical Service in Industry and Workmen's Compensation Laws. American College of Surgeons, Chicago, Ill., 1946.
(27) Selby, C.: Chronic disease as an industrial hygiene problem. Am. J. Pub. Health **39:** 598 (1949).
(28) Woody, McIver: Medical aspects of absenteeism in industry. New York State J. Med. **43:** (1943).
(29) Page, R. C.: Significance of nonoccupational disability. Arch. Indust. Hyg. and Occup. Med. **1:** 1 (1950).
(30) Price, L.: Industry's responsibility for worker health. Am. J. Pub. Health **39:** 367 (1949).
(31) Hellman, L. P., Brodman, K., and Deutschberger, J.: Minor illness, short medical absenteeism, lateness and separation in a mail-order firm: The firm as a whole. Indust. Med. **16:** 14 (1947).
(32) Meigs, J. W.: Illness and injury rates in small industrial plants. Occup. Med. **5:** 11 (1948).
(33) Injury rates in manufacturing: Fourth quarter, 1949. Monthly Labor Review **70:** 514 (1950).
(34) Injuries and Accident Causes in Textile Dyeing and Finishing. Bull. No. 962, U. S. Department of Labor, Bureau of Labor Statistics, Washington, U. S. Government Printing Office, 1949.
(35) Injuries and Accident Causes in Fertilizer Manufacturing. Bull. No. 949, U. S. Department of Labor, Bureau of Labor Statistics, Washington, U. S. Government Printing Office, 1949.
(36) Accident Facts. 1950 edition. National Safety Council, Chicago, Ill.
(37) Whitney, J. S.: Death Rates by Occupation. National Tuberculosis Association, New York, 1934.
(38) Britten, R. H.: Mortality rates by occupational class in the United States. Pub. Health Rep. **49:** 1101 (1934).
(39) Dublin, L. I., and Vane, R. J.: Occupational mortality experience of insured wage earners. Monthly Labor Review **64:** 1003 (1947).
(40) Occupation Study. The Actuarial Society of America and the Association of Life Insurance Medical Directors, New York, 1938.
(41) Puffer, R. R.: Industrial and occupational environment and health. *In* Backgrounds of Social Medicine. New York, Milbank Memorial Fund, 1949.
(42) Railroad Retirement Board. Annual Report 1949. Washington, U. S. Government Printing Office, 1950. *See also* The Monthly Review.

944592—51——3

Poliomyelitis, Hospital Inquiry, England and Wales, 1949

By W. H. Bradley, D.M., M.R.C.P., and A. H. Gales, D.M.*

In recent years the Ministry of Health has made two surveys on poliomyelitis cases admitted to hospitals in England and Wales. In 1947 a questionnaire, sent to some 300 hospitals and bringing 270 replies, was confined mainly to a purely statistical summary, except for questions relating to use of respirators and the effect of pregnancy.[1] In 1949 a similar questionnaire, sent to all regional hospital boards and boards of governors of teaching hospitals, was expanded to get further information on the use of respirators and the number of poliomyelitis cases occurring in pregnant women. In addition, information was sought on: (1) the number of cases occurring in persons who had had a tonsillectomy within 2 months of onset; (2) the number of cases occurring in persons who had received an injection or vaccination within 2 months of onset; and (3) incidents which suggested cross infection in the hospital.

Hospitals were asked to include all cases admitted in 1949. A detailed analysis of the cases is given in table 5.

General Statistics

Size of Sample

The returns received in 1949 relate to 7,832 patients admitted, and in 5,423 (69 percent) the diagnosis of poliomyelitis or polioencephalitis was accepted by the hospitals. The remaining 2,409 were classified "Not poliomyelitis or polioencephalitis." The 5,423 accepted hospital cases may be compared with the total "corrected" civilian notifications for the year of 5,920 (see table 3). Exact correspondence could not be expected but it appears that the survey covered most of the cases which occurred in England and Wales in 1949.

Age Incidence

Table 1 shows that 37 percent of the confirmed cases were under 5

*Ministry of Health, London. Condensed from the Monthly Bulletin of the Ministry of Health and the Public Health Laboratory Service, October 1950, pp. 216–220 and November 1950, pp. 242–247, by permission of the Controller, H. B. M. Stationery Office. Parts I and II have been combined in this presentation.

[1] The results of the 1947 survey were reported in the Monthly Bulletin of the Ministry of Health and Public Health Laboratory Service, vol. 7, March 1948, p. 56, and reprinted in Public Health Reports, vol. 63, March 1948, pp. 397–400.

years old, 33 percent between 5 and 15, and 30 percent were over 15 years of age. This table also shows that 18 percent of all deaths occurred in children under 5, 24 percent in children between 5 and 15, and 58 percent in persons over 15.

Sites of Paralysis

Among the 5,423 confirmed cases 3,707 patients (68.4 percent) had paralysis chiefly affecting the limbs or trunk; 599 (11.0 percent) had paralysis chiefly affecting cranial nerves; 1,002 (18.5 percent) had no paralysis but were diagnosed on the changes in the cerebrospinal fluid (726 cases) or on clinical grounds only (276). In 115 patients (2.1 percent) the symptoms and signs were indefinite but the diagnosis was made because of close contact with a definite case.

Severity [2]

The degrees of severity of the 4,306 (3,461) paralytic cases were as follows: 481 (333) were fatal; of the 3,825 (3,128) in which the patient recovered, 1,550 or 40.5 percent (1,285 or 41.1 percent) were classed as slight—not likely to interfere with normal life nor to require long stay in-patient hospital treatment; 1,472 or 38.5 percent (1,205 or 38.5 percent) as of moderate severity—likely to need long-stay hospital treatment but with good prospect of an ultimate return to normal life; and 803 or 21.0 percent (638 or 20.4 percent) as severe—not likely to return to normal life.

Table 1. *Number and percentage of cases and deaths, case fatality rate, and percent of cases with paralysis, by age*

Age	Cases		Deaths		Case fatality rate (percent)	Percent with paralysis
	Number	Percent	Number	Percent		
Under 1 year	237	4.4	17	3.4	7.2	92.4
1–4	1,770	32.2	76	15.0	4.2	85.8
5–14	1,771	32.7	121	24.0	6.8	72.7
15–24	835	15.4	108	21.4	12.9	74.4
25–34	509	9.4	105	20.8	20.6	80.0
35–44	223	4.1	57	11.3	25.6	82.5
45 and over	78	1.4	21	4.2	26.9	85.9
All ages	5,423	100.0	505	100.0	9.3	79.4

The age distribution of the 2,275 patients who survived in 1949 with either moderate or severe paralysis is given in table 2.

In table 3 notifications in 1949 are compared with the returns obtained from hospitals in the same year. The results of this inquiry can therefore be related to the total experience of the country.

Table 4 shows how patients fared after admission to hospitals in 1949 and in 1947. It is, of course, impossible to be sure until many months have elapsed how severe the ultimate paralysis will be, and these figures must be accepted with that reservation.

It must be remembered that when an epidemic is in progress the

[2] The figures in parentheses in this paragraph are taken from the survey for 1947.

early reports of numbers of cases generally relate to patients admitted to hospitals and that it is likely that such reports will exaggerate the true number of cases by nearly one-third.

Treatment in Respirators

In all, 560 patients were treated in respirators at some time during the year—213 were treated temporarily; 29 were likely to need permanent treatment in a breathing machine, and 318 died. On December 31, 32 patients (19 males and 13 females) were being treated in respirators. It is impossible to decide in the early stages of treatment in a respirator whether such treatment is likely to be permanently necessary. It is also impossible to prophesy how long the patient will survive. It would appear, however, that the number of respirators likely to be required for a long period for patients in hospitals at the end of 1949 did not exceed 30.

Table 2. *Age distribution of paralytic cases who survived, 1949*

Age group	Number	Percent	Age group	Number	Percent
Under 1 year	156	6.9	25–34	187	8.2
1–4	848	37.3	35–44	80	3.5
5–14	668	29.4	45 and over	24	1.1
15–24	312	13.7	Total	2,275	100.1

Table 3. *Poliomyelitis and polioencephalitis: England and Wales, notifications for 1949, compared with cases reported in the hospital inquiry, 1949*

Age group (years)	Males			Females			Total		
	Notifications	Hospital inquiry	Difference	Notifications	Hospital inquiry	Difference	Notifications	Hospital inquiry	Difference
Under 5	1,217	1,146	71	946	861	85	2,163	2,007	156
5–14	1,160	1,028	132	847	743	104	2,007	1,771	236
15 and over	911	873	38	839	772	67	1,750	1,645	105
Total	3,288	3,047	241	2,632	2,376	256	5,920	5,423	497

Table 4. *Expectation of paralysis or death in a notified case of poliomyelitis*

Admissions	1949	Percent of total admissions	1947	Percent of total admissions
Total	7,832	100	6,762	99.9
Not poliomyelitis	2,409	30.8	2,045	30.2
Nonparalytic recovered	1,093	13.9	1,229	18.2
Paralytic:				
Slight	1,550	19.8	1,285	19.0
Moderate	1,472	18.8	1,205	17.8
Severe	803	10.3	638	9.4
Died	[1] 505	6.4	[2] 360	5.3

[1] 24 deaths in nonparalytic cases.
[2] 27 deaths in nonparalytic cases.

Table 5. *Detailed analysis of hospital inquiry*

Status	Males								Females							
	Under 1 year	1–4	5–14	15–24	25–34	35–44	45 and over	Total	Under 1 year	1–4	5–14	15–24	25–34	35–44	45 and over	Totals
Total cases	169	1,357	1,597	643	339	195	108	4,408	130	986	1,086	546	416	168	92	3,424
Paralytic:																
Limbs and/or trunk:																
Slight	21	305	222	104	47	17	10	726	22	225	184	71	46	28	10	586
Moderate	59	309	216	94	39	30	5	752	41	241	174	78	57	16	4	611
Severe	31	173	144	91	64	39	12	554	31	114	131	90	75	28	9	478
Total	111	787	582	289	150	86	27	2,032	94	580	489	239	178	72	23	1,675
Other:																
Slight	5	42	67	14	9	1	2	140	1	34	31	13	15	3	1	98
Moderate	2	15	24	8	2	2	3	56	5	14	18	5	5	4	2	53
Severe		25	49	28	27	10	6	145	1	22	29	25	21	6	3	107
Total	7	82	140	50	38	13	11	341	7	70	78	43	41	13	6	258
Nonparalytic:																
With changes in CSF	5	96	190	89	32	12	4	428	5	66	128	58	32	7	2	298
With clinical signs only	3	31	83	31	15	10		173	1	24	36	22	10	7	3	103
Total	8	127	273	120	47	22	4	601	6	90	164	80	42	14	5	401
Presumptive	2	22	33	6	6	3	1	73	2	12	12	8	7		1	42
Not poliomyelitis nor polioencephalitis	41	339	569	178	98	71	65	1,361	21	234	343	176	148	69	57	1,048
Fatal cases (included in figures above):																
Paralytic:																
Limbs and/or trunk	6	15	33	29	33	24	6	146	7	13	20	30	25	16	7	118
Other		22	41	23	25	7	5	123	1	15	23	25	20	8	2	94
Total	6	37	74	52	58	31	11	269	8	28	43	55	45	24	9	212
Nonparalytic		7	2		2			11	3	4	2	1		2	1	13
Total fatal cases	6	44	76	52	60	31	11	280	11	32	45	56	45	26	10	225
All patients treated in respirator (1949):																
Temporarily	1	35	28	22	12	4	1	103	4	16	40	29	17	3	1	110
Permanently	1		3	5	1			10		1	8	4	3	3		19
Died	4	20	37	42	43	24	6	176	6	12	23	47	31	17	5	141
Total cases	6	55	68	69	56	28	7	289	10	29	71	80	51	23	6	270

NOTE: *Paralytic* includes all cases which have had any muscle weakness or paralysis, even if this was transient. *Limbs and/or trunk* means cases in which spinal paralysis is the predominant feature. *Other* means cases in which bulbar or cranial nerve paralysis is predominant.

Additional Information

The exact form of the questions asked in regard to pregnancy, tonsillectomy, injections or vaccinations, and cross infection in the hospital is given at the beginning of the section devoted to each heading. As a result of the experience gained in this inquiry it seems clear that too much should not be expected of an inquiry of so large a scope. It is probable that the information about pregnancies was reasonably comprehensive, but it was probably not so comprehensive on some of the other points.

Thus, at the time when the inquiry was made, for example, there had been no publications on the association between inoculations and poliomyelitis. It was not therefore generally known that some relationship was suspected, and the history of inoculation, even if it had occurred, was by no means certain to have been inquired into or to have been recorded.

The question about cross infection, although it elicited some interesting information, was difficult to frame in a sufficiently precise way, and the information is in all probability far from comprehensive.

The Effect of Pregnancy

The question on the inquiry form was as follows:

> Some evidence has been brought forward in the United States that pregnancy predisposes to poliomyelitis. This finding was not confirmed by the results of the 1947 inquiry but it seems desirable to gain further information. Brief notes should be given on individual cases of name, age, stage of pregnancy at date of onset, degree and distribution of paralysis, result as regards both mother and child.

In 1949 there were 69 cases among women pregnant at the time of onset of the disease, and altogether there were 737 cases among women of childbearing age (15–44). Of the pregnant women 14 died, and of the 668 women of childbearing age, who were not pregnant at the time of onset of the disease, 132 died. Thus the case fatality of the pregnant women was 20.3 percent, and that of the nonpregnant women, 19.8 percent. It does not seem, therefore, that pregnancy had any effect in increasing fatality. In 1947 there were 71 cases in pregnant women out of a total of 760 cases in women of childbearing age, but unfortunately information was not obtained about the number of deaths of pregnant women.

The Effect of Tonsillectomy

The reference to this subject on the form was as follows:

> It is generally believed that a recent tonsillectomy favors the development of the bulbar form of poliomyelitis. Brief notes should be given on any patient who had had a tonsillectomy within 2 months of admission. Clearly it is important to record cases in which the tonsillectomy had no apparent effect as well as those in which it had. Notes should give name, age, sex, degree and distribution of paralysis, and result.

Table 6. *Sixteen cases of poliomyelitis following recent tonsillectomy reported by hospitals in 1949*

Sex	Age in years	Interval operation to onset	Type of disease	Notes
M	7½	2 weeks	Bulbar	Died. These boys were brothers.
M	4	do	do	
M	9	1 month	do	Died.
F	6	14 days	do	Do.
M	4	17 days	Bulbo-spinal	Severe peripheral paralysis.
F	24	3 weeks	do	L. facial paralysis and slight peripheral paralysis.
M	2½	11 days	do	Bilateral palatal and pharyngeal paralysis. Weakness arms and legs.
M	7	3 weeks	Spinal	Good recovery.
M	6	1 month	Bulbar	Mild case. Good recovery.
M	6	3 weeks	Spinal	Severe paralysis. Both legs and trunk.
F	2	1 month	do	Severe paralysis both legs.
F	7	14 days	do	Moderate degree of paralysis. Site not stated.
F	12	17 days	do	Moderate paralysis R. arm.
F	4	16 days	do	Moderate paralysis L. arm.
F	6	29 days	do	Moderate paralysis L. leg.
M	10	2 months	No paralysis	CSF—cells 150.

Only 16 cases were reported in which a tonsillectomy had been performed within 2 months of onset of the disease. It is clearly impossible to draw any conclusions from this small number as to whether tonsillectomy is, or is not, a predisposing cause of poliomyelitis. It seems probable that, in view of the detailed notice which this subject has received in the American literature and of the advice given in this country, the number of operations performed during the poliomyelitis epidemic had been greatly restricted.

The clinical history of these cases is, however, of interest because of the high proportion of cases with bulbar symptoms (see table 6).

Local Trauma and Poliomyelitis

When the hospital survey was begun this subject had not been generally discussed in the medical papers, and it is probable that the information obtained was very incomplete, because at that time there seemed to be no reason for a special inquiry on a history of inoculation. The form of the question was as follows:

Injections or vaccinations. From time to time cases have been reported to the Ministry in which it seemed that an injection, usually but by no means always of a diphtheria antigen, might have something to do with the development of a localized paralysis. The cause or causes of these paralyses are unknown, and it is possible that the association is purely a chance one. Only injections given within 2 months of onset should be noted. Brief notes should be given of name, age, sex, date of injection, site and severity of paralysis.

In all, 55 cases were reported in which an injection of some kind had been given within 2 months of onset of the disease. These cases have not been analyzed in detail because the results of a parallel inquiry specially directed to this matter [3] made it clear that the information obtained from hospitals was incomplete. The special inquiry

[3] Hill, A. Bradford, and Knowelden, J.: Inoculation and poliomyelitis: A statistical investigation in England and Wales, in 1949. Brit. M. J. 2: 1-6 (1950).

was directed only to injections of antigens, but here attention may be called to the cases summarized under 1–4 in the following section because in these it seems possible that an injection or local trauma may have had some association with the onset of the disease.

Cross Infection in Hospital

The question asked on the form was as follows:

Cross Infection in Hospital. This has generally been regarded as very rare but comprehensive information would be valuable. Notes should state whether any instances of suspected cross infection have occurred in (*a*) staff or (*b*) patients. Negative as well as positive information is valuable. Information as to dates of onset and some indication of the degree of contact (e. g. same ward, next bed, etc.) should be given.

The following notes summarize the information received.

1. Two cases occurred in an orthopedic hospital to which patients convalescent from poliomyelitis were being transferred from a hospital for infectious diseases.

2. Two cases occurred in children who had been admitted to general wards of hospitals where poliomyelitis patients were also admitted.

3. One child with measles and pneumonia developed paralysis 4 weeks after admission to a hospital for infectious diseases.

4. There were seven cases among children admitted for medical and surgical treatments in general hospitals which also cared for poliomyelitis patients. Each of these seven had one or more injections of penicillin or streptomycin prior to onset of paralysis.

The incidents so far described all relate to patients. In the following instances members of the staff were apparently infected by patients.

1. At a general hospital, two nurses, who had had some, though not very close, contact with patients suffering from poliomyelitis, subsequently developed the disease.

2. In a hospital for infectious diseases a nurse, aged 23, who was working in a ward in which there was one patient with poliomyelitis, developed the disease.

3. In a general hospital two nurses, both of whom had been nursing patients with poliomyelitis, developed the disease.

4. In a general hospital a nurse, working in the poliomyelitis ward, without any prodromal illness, developed weakness of the dorsiflexors of the left foot.

5. In a hospital for infectious diseases, a young woman ward orderly, who was helping to nurse poliomyelitis patients, developed the disease.

These are instances where members of the staff may have been infected directly by patients. In addition there were two instances where a member of the staff seems to have carried infection home to a member of her family.

1. A nurse, nursing children in an orthopedic ward of a general hospital, in which there were some patients convalescent from poliomyelitis, went home for the weekend; a fortnight later, her younger sister developed the disease. The nurse's home was in a place where no other cases of poliomyelitis had occurred. This incident is noteworthy because according to the generally accepted standards, the children in the orthopedic ward should have long ceased to be infectious.

2. A part-time physiotherapist was treating patients with poliomyelitis in a hospital for infectious diseases when her daughter, aged 3½, developed the disease.

When the list of possible instances of cross infection is set out thus, it appears formidable, but it must be remembered that the survey covered many hospitals and that 5,423 cases of poliomyelitis were treated in them in 1949. It should also be remembered that it is hardly ever possible to be certain of the source of poliomyelitis infection. It is very difficult to reconcile the date of onset in some of the above instances with the generally accepted views about the period of infectivity and the incubation period. These reservations must be made before any generalizations are attempted. The survey seems to confirm the usually accepted view that cross infection is rare, but it also suggests, first, that it seems to occur more often in general hospitals than in hospitals for infectious diseases and, secondly, that children admitted for operations should be particularly closely guarded against any possiblity of infection.

Until more is known of the means whereby the infection is transmitted, it would seem prudent not to admit into a general ward any patient who, by reason of a history of contact or of doubtful signs referable to the central nervous system, might be suspected of poliomyelitis. The rigid nursing discipline adopted in cases of typhoid infection should be followed in nursing any patient in whose case there is a suspicion of poliomyelitis, particularly in the preparalytic and early paralytic phases. These are admittedly counsels of perfection, when one is dealing with a disease of which the early signs and symptoms are so often indefinite and misleading.

Conclusions

1. The general statistics for 1949 do not differ markedly from those of 1947.

2. The proportion of patients admitted who were subsequently found to be suffering from some other disease was 30.8 percent in 1949 and 30.2 percent in 1947.

3. Judging from the experience of the years 1947 and 1949, of every 100 patients admitted to hospital with suspected poliomyelitis during

an epidemic period 5 or 6 are likely to die, 9 or 10 are likely to be severely paralyzed, 17 or 18 are likely to have a degree of paralysis which, properly treated, is not likely to prevent them from working, and the remaining 65 or 70 are likely to suffer either no ill effects or to be left with a slight degree of paralysis which may pass almost unnoticed.

4. Some support is given to the following conclusions:

(*a*) Pregnancy does not increase the risk of death from poliomyelitis.

(*b*) Bulbar lesions are more frequent in patients in whom poliomyelitis follows a recent tonsillectomy.

(*c*) Cross infection with poliomyelitis may occur in hospital wards but is least frequent in infectious diseases hospitals.

Chronic Illness Bibliography Published

Available information on chronic illness, published in the period 1940–49, has been abstracted in a series of 545 digests in a publication recently issued by the Public Health Service. The digests are grouped in six major sections, each with several subdivisions to aid in bringing together under appropriate headings materials relating to the extent of chronic illness and measures recommended or initiated to prevent or control its severity and consequences.

In the first section, on dimensions of the problem, are references to sources revealing the extent and significance of chronic illness in the general population, among children, among persons in the working ages, and among the aged.

The second section, a compilation of data on contributory factors in chronic illness, includes information on the aging process, on genetic influences and dietary factors, on emotional, psychological, and psychosomatic aspects, and on socio-environmental factors.

The section on institutional care has five subdivisions—hospitals; convalescent homes; nursing, boarding, and foster homes; homes for the aged; and almshouses and other public institutions.

References on noninstitutional services, the fourth major section, are classified under the following headings: clinics, home care programs, home nursing, housekeeper services, and housing for the aged.

The rehabilitation section contains selected references on achievements, goals, and needs; physical and occupational therapy; and recreational and educational programs in hospitals and in communities.

The last section, on State and local approaches to the problem, includes recommendations of State and local groups that have surveyed local needs, descriptions of community organization and techniques, and data on medical care and control programs.

An index to the authors of the material digested and an index to agencies and institutions cited in the digests increase the usefulness of the publication as a reference tool. Limited numbers of copies have been distributed by the Public Health Service to State health departments and other organizations concerned with chronic illness. The publication is titled "Chronic Illness: Digest of Selected References" and is Public Health Service Publication No. 10. It was prepared by Violet B. Turner for the Division of Public Health Methods, and is on sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at 50 cents a copy.

Incidence 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 May 19, 1951

Rocky Mountain spotted fever cases increased from 6 for the week ended May 12 to 15 for the current week. Eleven cases were reported for the same week last year. Seven of the 15 cases were reported in the South Atlantic States and 6 in the Mountain and Pacific regions. California reported the first case for 1951 from Lassen County.

Poliomyelitis cases increased slightly from 71 last week to 78 cases for the current week. For the week ended May 20, 1950, 94 cases were reported.

A case of leptospirosis was reported in San Bernardino County, California, with laboratory confirmation by animal inoculation.

Epidemiological Reports

Shigellosis

Dr. D. H. Stevens, Maine Commissioner of Health and Welfare, reports an outbreak of *Shigella* infection in a family in Lewiston. Dr. R. J. Wiseman, Jr., who made the investigation, states that the first case was discovered by chance when a 4-year-old child, who had received a head injury last fall, developed convulsions along with diarrhea. The latter was diagnosed as "intestinal flu" by the parents. Stool examination revealed an infection by *S. sonnei*. At about the same time, three other children in the family had fever and diarrhea. Two had *S. sonnei* in their stools. Other similar types of infection are believed to have been occurring in the community.

Salmonellosis

Dr. D. S. Fleming, Minnesota Department of Health, has reported an outbreak of *Salmonella typhimurium* infection. The suspected source of infection was raw turkey eggs used in preparing eggnog from which the organism was isolated. The eggnog was prepared by scalding a mixture of turkey egg yolks, pasteurized milk, and other ingredients in a double boiler and then allowing it to cool at room temperature. Beaten turkey egg whites were then added and allowed to stand 1 hour before refrigeration. Gin was added for "flavoring"

before serving. Ten of the 11 persons who drank the eggnog became ill with gastroenteritis 7 to 24 hours later. *S. typhimurium* was isolated from 9 of the 11 persons, including 1 who did not develop clinical symptoms.

Trichinosis

Dr. J. C. Hart, Connecticut Department of Health, has reported a family-group outbreak of trichinosis in Bridgeport. Home-made Italian sausage, which was prepared with ham purchased from a large packing house, was eaten by the family on April 4. Symptoms appeared 12 days later in the father, mother, two daughters, and a daughter-in-law. Nausea, diarrhea, vomiting, and swelling of the eyelids preceded the onset of muscular pains in each case.

Gastroenteritis

Dr. J. C. Hart has reported an outbreak of gastroenteritis which occurred recently at the University of Connecticut. Sixty-five persons who had eaten turkey and creamed turkey either at dinner on May 9 or at lunch the next day, had diarrhea, vomiting, cramps, and fever of varying degrees of severity. The incubation period varied from 5 to 24 hours. Recovery took place in 36 hours or less. The cook who prepared the turkey admits that he had diarrhea at the time he was preparing the food. Laboratory examination of food specimens is not completed.

Comparative Data For Cases of Specified Reportable Diseases: United States

[Numbers after diseases are International List numbers, 1948 revision]

Disease	Total for week ended—		5-year median 1946–50	Seasonal low week	Cumulative total since seasonal low week		5-year median 1945–46 through 1949–50	Cumulative total for calendar year—		5-year median 1946–50
	May 19, 1951	May 20, 1950			1950–51	1949–50		1951	1950	
Anthrax (062)	4	4	2	(1)	(1)	(1)	(1)	35	16	19
Diphtheria (055)	52	72	162	27th	4,556	6,966	10,123	1,649	2,695	3,765
Encephalitis, acute infectious (082)	29	14	10	(1)	(1)	(1)	(1)	319	262	177
Influenza (480–483)	686	1,041	578	30th	126,644	145,449	145,449	112,102	134,865	125,543
Measles (085)	23,837	15,846	23,635	35th	370,789	211,299	428,100	342,088	192,169	393,154
Meningitis, meningococcal (057.0)	73	68	77	37th	3,010	2,763	2,732	2,049	1,849	1,760
Pneumonia (490–493)	1,013	1,491	(2)	(1)	(1)	(1)	(1)	[3]37,073	48,333	(2)
Poliomyelitis, acute (080)	78	94	94	11th	560	645	536	1,772	1,776	937
Rocky Mountain spotted fever (104)	15	11	18	(1)	(1)	(1)	(1)	34	42	52
Scarlet fever (050) [4]	1,726	1,280	1,883	32d	59,702	49,809	73,097	44,011	33,370	50,553
Smallpox (084)			5	35th	13	41	66	5	21	45
Tularemia (059)	10	16	20	(1)	(1)	(1)	(1)	274	403	403
Typhoid and paratyphoid fever (040, 041) [5]	48	47	61	11th	369	445	455	804	955	955
Whooping cough (056)	1,486	3,018	2,026	39th	52,258	74,531	73,282	30,656	52,995	42,016

[1] Not computed.
[2] Data not available.
[3] Addition: Florida, week ended May 12, 27 cases.
[4] Including cases reported as streptococcal sore throat.
[5] Including cases reported as salmonellosis.

Reported Cases of Selected Communicable Diseases: United States, Week Ended May 19, 1951

[Numbers under diseases are International List numbers, 1948 revision]

Area	Diphtheria (055)	Encephalitis, infectious (082)	Influenza (480–483)	Measles (085)	Meningitis, meningococcal (057.0)	Pneumonia (490–493)	Poliomyelitis (080)
United States	**52**	**29**	**686**	**23,837**	**73**	**1,013**	78
New England	**1**	**1**	**1**	**1,072**	**3**	**31**	2
Maine				19		4	1
New Hampshire				12		2	
Vermont				129			
Massachusetts	1	1		566	3		1
Rhode Island			1	9		1	
Connecticut				337		24	
Middle Atlantic	**18**	**16**	**2**	**4,079**	**11**	**182**	**9**
New York	4	15	[1] 2	1,839	5	50	4
New Jersey	2			803	4	87	2
Pennsylvania	12	1		1,437	2	45	3
East North Central	**2**	**4**	**14**	**4,432**	**17**	**85**	**6**
Ohio	2			1,241	10		
Indiana			10	118		6	
Illinois			1	614	2	51	4
Michigan		4	3	634	1	28	2
Wisconsin				1,825	4		
West North Central	**2**	**1**	**22**	**1,176**	**4**	**79**	**2**
Minnesota			1	100	2	8	
Iowa				154			
Missouri	1		3	368	1		
North Dakota		1	15	72		59	
South Dakota				3		1	1
Nebraska	1			15			1
Kansas			3	464	1	11	
South Atlantic	**7**	**2**	**270**	**2,121**	**16**	**74**	**17**
Delaware				30			
Maryland			7	307	3	34	
District of Columbia				63	1	14	
Virginia	2	1	228	837	6	8	
West Virginia	2			362	3		2
North Carolina	2	1		98			6
South Carolina	1		10	31		6	1
Georgia			25	255	1	12	3
Florida				138	2		5
East South Central	**7**	**2**	**43**	**532**	**8**	**54**	**2**
Kentucky			8	143	3	15	
Tennessee			30	115	3		
Alabama	4	2		238	2	18	2
Mississippi	3		5	36		21	
West South Central	**11**	**1**	**124**	**3,495**	**4**	**329**	**19**
Arkansas	3		77	280	1	37	2
Louisiana	1			59	1	55	4
Oklahoma	1		47	317	1	17	1
Texas	6	1		2,839	1	220	12
Mountain	**2**		**173**	**1,131**		**90**	**3**
Montana			23	79			
Idaho				104			1
Wyoming				64		4	
Colorado	1		19	231		25	2
New Mexico			3	188		38	
Arizona	1		128	400		23	
Utah				63			
Nevada				2			
Pacific	**2**	**2**	**37**	**5,799**	**10**	**89**	**18**
Washington	1		8	1,507	3	1	4
Oregon			13	651		29	1
California	1	2	16	3,641	7	59	13
Alaska			6				
Hawaii	1		4	15		1	

[1] New York City only.

Anthrax: Massachusetts, New York, Missouri, and California: 1 case each.

Reported Cases of Selected Communicable Diseases: United States, Week Ended May 19, 1951—Continued

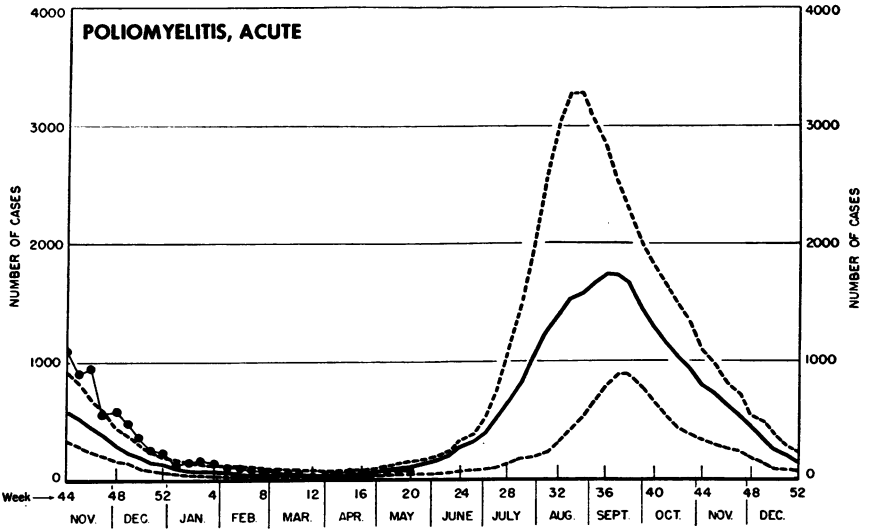
[Numbers under diseases are International List numbers, 1948 revision]

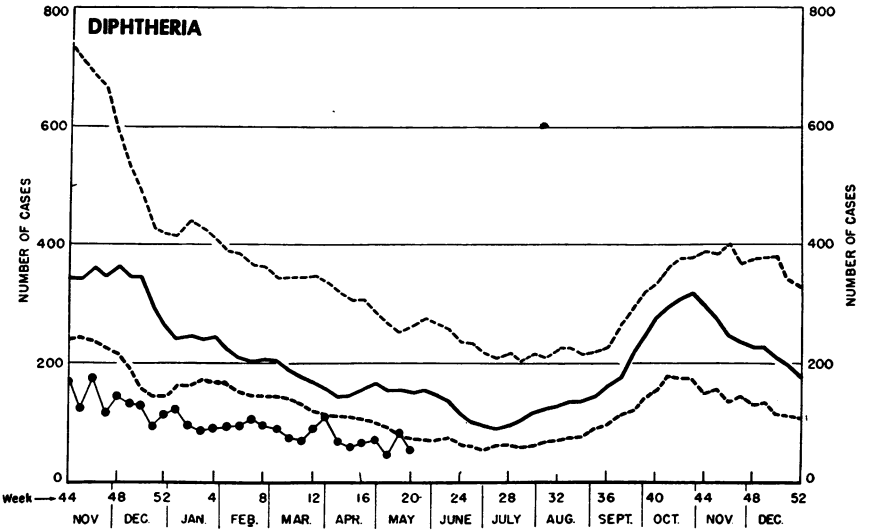
Area	Rocky Mountain spotted fever (104)	Scarlet fever (050)	Small-pox (084)	Tulare-mia (059)	Typhoid and para-typhoid fever [1] (040, 041)	Whooping cough (056)	Rabies in animals
United States	**15**	**1,726**		**10**	**48**	**1,486**	**142**
New England		**172**			**4**	**90**	
Maine		19				11	
New Hampshire		[2] 8				6	
Vermont		1				3	
Massachusetts		118			4	54	
Rhode Island		3				6	
Connecticut		23				10	
Middle Atlantic		**334**			**4**	**161**	**12**
New York		[2] 178			1	56	8
New Jersey		63			1	53	
Pennsylvania		93			2	52	4
East North Central	**1**	**579**			**4**	**153**	**25**
Ohio		226			3	25	2
Indiana	1	16				7	16
Illinois		58				18	2
Michigan		233			1	40	4
Wisconsin		46				63	1
West North Central		**68**			**2**	**68**	**28**
Minnesota		24				4	1
Iowa						32	24
Missouri		19			1	9	3
North Dakota		6				5	
South Dakota		8					
Nebraska		1					
Kansas		10			1	18	
South Atlantic	**7**	**127**		**2**	**7**	**236**	**15**
Delaware		2				1	
Maryland	4	40				6	
District of Columbia		9				3	
Virginia	2	17			1	63	3
West Virginia		12					1
North Carolina	1	24		1	1	77	
South Carolina		4				5	11
Georgia		7		1	2	35	
Florida		[2] 12			3	46	
East South Central		**33**			**5**	**123**	**20**
Kentucky		8				15	13
Tennessee		19			1	20	6
Alabama		6			3	70	
Mississippi					1	18	1
West South Central	**1**	**53**		**7**	**8**	**369**	**39**
Arkansas	1	2		2	3	46	
Louisiana		3		3	1	12	[3] 19
Oklahoma		4				30	8
Texas		44		2	4	281	12
Mountain	**3**	**76**		**1**	**6**	**205**	
Montana		9		1		19	
Idaho	1	12				11	
Wyoming	1					32	
Colorado	1	4			1	34	
New Mexico		7			2	47	
Arizona		4			3	57	
Utah		[2] 40				5	
Nevada							
Pacific	**3**	**284**			**8**	**81**	**3**
Washington		36				21	
Oregon	2	24			1	5	
California	1	[2] 224			7	55	3
Alaska							
Hawaii		6					

[1] Including cases reported as salmonellosis.
[2] Including cases reported as streptococcal sore throat.
[3] Report for April.
Rabies in man: South Carolina, 1 case.

Communicable Disease Charts

All reporting States, November 1950 through May 19, 1951





The upper and lower broken lines represent the highest and lowest figures recorded for the corresponding weeks in the preceding 5 years. The solid line is a median figure for the preceding 5 years. All three lines have been smoothed by a 3-week moving average. The dots represent numbers of cases reported weekly, 1950–51.

FOREIGN REPORTS

NEW ZEALAND

Reported Cases of Certain Diseases and Deaths—4 Weeks Ended Feb. 24, 1951, and 5 Weeks Ended Mar. 31, 1951

Disease	4 weeks ended Feb. 24, 1951		5 weeks ended Mar. 31, 1951	
	Cases	Deaths	Cases	Deaths
Actinomycosis			1	
Brucellosis	9		6	
Diphtheria	7		19	
Dysentery:				
Amebic	4		8	
Bacillary	10		27	1
Erysipelas	8		9	
Food poisoning	8		30	
Malaria	1			
Meningitis, meningococcal	8		9	1
Poliomyelitis	5	1	3	
Puerperal fever	3		4	
Scarlet fever	58		79	
Tetanus	4	2		
Trachoma			3	
Tuberculosis (all forms)	123	28	164	46
Typhoid fever	8		13	1

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

The following reports include only items of unusual incidence or special interest and the occurrence of these diseases, except yellow fever, in localities which had not recently reported cases. 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

Burma. An increase in the number of cases of cholera was reported in Mergui for the week ended May 12, 1951, from 17 cases the previous week to 47. Decreases were noted in Bassein and Rangoon for the week ended May 12, from 65 to 35 cases and 7 to 2 cases, respectively. Moulmein reported little change from 3 to 4 cases during this period.

India. During the week ended May 12, 1951, 281 cases of cholera were reported in Calcutta compared with 347 for the previous week. In Madras 14 cases were reported for the week ended May 12, compared with 9 for the previous week.

Smallpox

Cameroon (French). During the period April 21–30, 1951, 12 cases of smallpox were reported in French Cameroon.

India. The incidence of smallpox has been decreasing rapidly in some ports of India during recent weeks. For the week ended May

12, 1951, 111 cases were reported in Calcutta compared with 571 for the second week in March. Bombay and Madras reported 53 and 54 cases, respectively, for the week ended May 12. For the second week in March these ports reported 115 and 206 cases, respectively. In the ports of Masulipatnam and Visakhapatnam little change took place. Masulipatnam reported a decrease from 12 to 11 and Visakhapatnam reported an increase from 10 to 12 for this period.

Netherlands. Single cases of smallpox have been reported, as of May 15, 1951, in two cities located near Tilburg, namely, Breda and Vught. Another case has been reported in Sint-Michiels Gestel.

Yellow Fever

Brazil. Confirmed deaths from jungle yellow fever have been reported in counties as follows. Jaraqua, February 24–March 19, four; Mineiros, February 28, one; Goias, March 9, one; Anapolis, March 11, one; Rio Verde, March 15, one; Goiania, March 18, one; and Inhumas, March 19, one.