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THE INCIDENCE OF ILLNESS IN A GENERAL POPULATION GROUP

General Results of a Morbidity Study from December 1, 1921, Through March 31, 1924, in Hagerstown, Md.[1]

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The problems and aims of public health are still set forth almost entirely in lethal terms whenever statistics are used. We speak of an unfavorable death rate and measure success in a lowered mortality. The best indices which have been available of the prevalence of nearly all diseases are the fatal cases only; and our epidemiology is limited, for the most part, to statistics of deaths.

The reasons for this condition are fairly clear to every vital statistician and will not be discussed here. Of greater pertinence is the result of a prolonged dependence upon mortality statistics. The effect has been to foster a fallacious premise for public health work, namely, that a low death rate indicates the presence of health. Obviously it does not. We know that, on the contrary, an exceedingly unhealthful region may exhibit a relatively low mortality, as, for example, a heavily infested hookworm locality or a section abounding in malaria. Pellagra may be widely prevalent in a community without affecting perceptibly its general death rate or even increasing materially the number of deaths from the disease itself. Instances of the same sort could be multiplied. The ill health that is manifested in symptoms, in discomfort, in lessened vigor and efficiency, even in illness and suffering, is not reflected in the death rate, except for certain diseases, for any purpose practicable in preventive work.

What really matters more to the sanitarian, therefore, in his scientific searching for causes and conditions and in his preventive work is not deaths but *ill health*. Of far greater importance to him than the life table or the list of causes of death is a view of the health situation as depicted by records of the occurrence of *sickness* and its causes. If such a view were permitted him, it will hardly be denied that the change in his perspective would lead him to modify considerably his scheme for research and his program of effort.

Such a view of the health—as contrasted with the death—situation is not an impossible dream. While their significance may not yet be

[1] From the Statistical Office, United States Public Health Service.

fully recognized, a succession of serious attempts has recently been made to collect records of disease incidence and prevalence in addition to and wholly apart from the notification of communicable diseases for administrative purposes. Within the natural limitations of the methods employed these efforts have been rewarded with considerable success. Continuous sickness records for industrial employees, school children, and other groups are yielding a knowledge of the incidence of certain diseases that hitherto had not been possible from mortality statistics or from statistics of notifiable diseases. Sickness surveys have made a similar contribution to the knowledge of disease prevalence. Physical examinations of many groups, some of them on a large scale, have revealed conditions before not recognized nor even imagined. These beginnings in morbidity data already have done more than bring to light conditions previously not adequately known; they have given glimpses of what the sanitarian has long wanted to see—a picture of the public-health situation as a whole, drawn in proper perspective and painted in true colors.

In the hope of contributing to this knowledge, and as a part of its morbidity statistics studies, the Statistical Office of the United States Public Health Service undertook a series of repeated observations upon the incidence of illness in a general population group in Hagerstown, Md. This work was begun in the autumn of 1921 and was continued for a period of nearly two and a half years, a record of illnesses according to cause having been secured for a population of between 8,000 and 9,000 persons. In the present communication it is purposed to give only a brief summary of the results from the point of view suggested in the foregoing paragraphs. The figures here given are provisional, since they are the results of a preliminary tabulation. In later papers it is planned to present the final results in greater detail, as well as certain epidemiological analyses in studies of specific diseases.

METHOD OF OBSERVATION

The population actually observed for the entire period included about 1,600 families, composed of about 7,200 *white* persons of all ages and both sexes, living under conditions that in no remarkable way were unusual. The family was the unit for observation, and, so far as possible, all members actually resident in each family were under observation. Since the same families were observed throughout the period, the data approximate a continuous record for 28 months, including nearly three winter and two summer seasons.

A more extended discussion of the method of the study will appear in a later paper, but a brief description is as follows:

(1) A preliminary house-to-house survey was made by members of the staff of the Statistical Office in November, 1921, in several sections

of Hagerstown, in the course of which the population of these sections was enumerated and records were made (*a*) for each individual relating to color, sex, and age, past occurrence of certain contagious diseases and present acute or chronic disease or ailment, and (*b*) for each household relating to its general economic status, sanitary condition, method of excreta disposal, and water and milk supplies.

(2) This survey was followed by a series of 16 canvasses, each household being visited by a trained field assistant at intervals of from six to eight weeks. At each visit a history of the incidence of sickness in the family since the preceding visit, with a statement of the date of onset, duration, extent of disabling effects, and attendance of physician, was obtained from a relatively responsible informant, usually the housewife.

(3) In addition, other sources of information were regularly and systematically utilized in obtaining the record of disease prevalence as follows: (*a*) Weekly records of absence from school, specifying the nature of the illness whenever illness was the cause so far as the teacher could ascertain it; (*b*) reports of all cases treated in the various clinics maintained in conjunction with the Washington County Health Demonstration, all of the clinics being participated in by local physicians; (*c*) reports of notifiable diseases from practicing physicians; (*d*) reports of district nurses; (*e*) data collected in field investigations of child hygiene by the United States Public Health Service in cooperation with the Washington County Health Demonstration; (*f*) physicians' diagnoses, the statements of the diagnoses of all cases attended by physicians being submitted to the physicians concerned for their review and correction.

We were able to obtain a reasonably accurate record of the persons actually under observation (i. e., "population" or "exposure") since a record was kept of each individual's "absence from observation," whether this was actual absence from the locality or a period for which records of his sicknesses were not available. The cooperation given by the families was very satisfactory and very gratifying. Since these families resided in several sections of the city and composed about one-fourth of its total white population, it is believed that they constituted a fair representation of the groups which appeared to differ with respect to economic status and sanitary environment.

The result of these canvasses is not, of course, a complete record of *all* of the ill-health prevalent in this population during the period of observation nor even an accurate statement of the causes of all the attacks of disease which were recorded. Such a record was impracticable for so large a population of this kind, and no false hopes of obtaining it were indulged in. The chief aim of the investigation was a record of *illnesses* from such causes as might occur in a population group that in no remarkable respect was unusual or unrepresentative of the general population living in towns or small cities.

From previous experience in sickness surveys, continuous morbidity records and disability records of industrial employees, we were led to believe that the intervals between visits chosen for the present study would probably yield a fairly accurate record of real illnesses. The length of interval between inquiries obviously is an important determinant of how much sickness will be recorded: a weekly inquiry will elicit information on more slight ailments than a monthly inquiry, and an inquiry made every six or eight weeks will fail to obtain information on many ailments of very short duration or of several days' duration but accompanied by slight discomfort. Accordingly, less than 4 per cent of the illnesses of exactly stated durations recorded in our study were one day or less in duration. Nearly 80 per cent were three days or longer, and 60 per cent were eight days or longer in duration. Approximately 40 per cent were not only disabling but caused confinement to bed. It is evident, therefore, that in the main the illnesses recorded were more than trivial in their character, in spite of the fact that in some instances mere symptoms were given as diagnoses. The incidence of acute attacks of specific and generally recognizable diseases has been, we feel, recorded with a satisfactory degree of completeness; on the other hand, the incidence of mild attacks, as, for example, of coryza, and of slight disorders and even of serious conditions when such conditions were not accompanied by noticeable symptoms, is probably incomplete and in many instances inaccurate in spite of the fact that a record of 28 months was obtained for the same individuals. Cases attended by physicians may be said to be quite complete.[1]

[1] A fairly accurate check on the completeness of the records obtained is afforded by the records of absences from school on account of sickness. Through the excellent cooperation of the Hagerstown school administration and teachers, every absence with notation as to cause was recorded. The records of absences due to sickness were classified according to days lost from school and a similar tabulation was made for the records obtained in the house-to-house canvasses, the same period being used. The results were as follows:

Comparison of results of school sickness records with records obtained in repeated house-to-house canvasses in Hagerstown, Md., for a 10 months' period

Days lost from school on account of sickness	Rate per 1,000 children enrolled		Ratio of (2) to (1)
	Children enrolled in city schools (1)	Children in families canvassed (2)	
One day or more	1,730	877	51
Two days or more	1,033	747	72
Three days or more	647	646	100
Four days or more	451	501	111
Five days or more	346	380	110
Six days or more	232	260	112

It is evident that the two sets of records are fairly comparable so far as sicknesses involving absence from school for more than two days are concerned. The short illnesses were frequently missed by the particular house-to-house method used, apparently only about one-fifth of the one-day absences and one-fourth of the two-day absences being recorded; at the same time the well-known tendency for brief absences for other reasons to be credited to sickness in school records must be taken into account. The results of the two methods checked remarkably well for absences of three days or longer due to various specific causes with the exception of "headaches," which appeared more frequently in the school reports.

Taking into consideration age and sex, the results of the repeated canvasses also compared favorably with our records of industrial employees disabled on account of sickness for periods lasting three days or longer.

It should be kept in mind, of course, that the results of this study are not comparable, except in certain details, with the results of previous canvasses and surveys. This point will be discussed in more detail in a later report.

SUMMARY OF RESULTS

In all, 19,054 illnesses as described above were recorded during the 28 months' period, December 1, 1921–March 31, 1924. Since 16,840 "years of exposure" [1] were recorded, an annual rate is shown of 1,131.5 per 1,000 population.

During the same period the annual death rate for the entire white population of Hagerstown, exclusive of nonresidents, was 10.6 per 1,000.

Upon the assumption that the illness rate of 1,132 per 1,000 prevailed in the entire population of the city, an incidence of slightly more than 100 cases of illness for each death is indicated.

The occurrence of mild epidemics of influenza in 1922 and 1923 must, of course, be taken into account in estimating a morbidity rate which is not affected by unusual conditions. If we subtract from our recorded illnesses the cases of influenza which occurred in definite epidemics during the 28 months' period, as well as allow for the fact that almost three winters were included in our period, the annual morbidity (illness) rate would probably be somewhere between 800 and 900 per 1,000 persons of all ages and both sexes.

To show at a glance the general character of the morbidity recorded, the cases of illness have been classified into 10 broad groups arranged roughly in accordance with the International List of Causes of Death:

TABLE 1.—*Morbidity from 10 groups of causes in a population group of 7,200 white persons of Hagerstown, Md., December 1, 1921–March 31, 1924*

[Numbers in parentheses refer to those given in International List of Causes of Death, 1920]

Cause	Annual rate per 1,000 persons observed
All causes	1,131.5
Respiratory diseases and disorders (11; 31; 97–107; 109)	668.6
General diseases (1–10; 12–30; 32–69; 158) [a]	124.1
Diseases and disorders of the digestive system (108; 110–127)	117.2
Diseases and disorders of the nervous system (70–84) [b]	46.8
Nonvenereal diseases of the genito-urinary system and annexa (135–150)	36.8
Diseases and disorders of the circulatory system and kidneys and annexa (87–96; 128–134)	35.9
Accidents and other external causes (175–203) [c]	34.8
Skin diseases and disorders (151–154)	22.8
Diseases and disorders of eyes and ears (85–86)	20.8
All other causes (155–157; 159–174; 204–205) [d]	16.6

[a] See Table 2.
[b] Includes "Headaches without other symptoms" (No. 205).
[c] "Fatigue" is not included (No. 192).
[d] Includes fatigue (No. 192).

[1] A "year of exposure" being the equivalent of one person observed for a year.

The incidence of respiratory diseases and disorders is so great that it at once challenges attention. Their relatively high frequency as causes of disabling sickness among wage-earners has already been pointed out in previous publications of the Statistical Office (1), but their preponderance among the causes of illness in the general population had not been so definitely shown until the present study was made.[1] The fact is even more striking when it is recalled that our data are far from being complete records of the incidence of the minor respiratory ailments of short duration. The school records obtained in Hagerstown showed that the incidence of "colds," aside from more definitely described respiratory affections, was 744 per 1,000 children for 180 school days, and that the mean duration in days of absences from school because of "colds" was 2.5 (2). A preliminary report on a study of minor respiratory diseases now in progress has revealed that during a five and one-half months' period (October 15, 1923–March 31, 1924) 90 per cent of a typical group of college students suffered from one or more attacks, and that the incidence rate was 1900 per 1,000 for this period (3).

The chronological picture shown in Figure 1 indicates an extraordinary variation in the weekly incidence of cases of illnesses. The seasonal as well as shorter variations were so great in respiratory diseases that the group of illnesses due to these causes determined largely the variation in total illness. The sharp peaks in March, 1922, and February, 1923, were caused by epidemics of "colds" and influenza and grippe, but the January, 1924, peak included but few cases of influenza and grippe. While little evidence of seasonal variation appeared for nonrespiratory diseases, considered as a group, an apparently higher incidence occurred during the greater part of 1923 than in the remainder of the period.

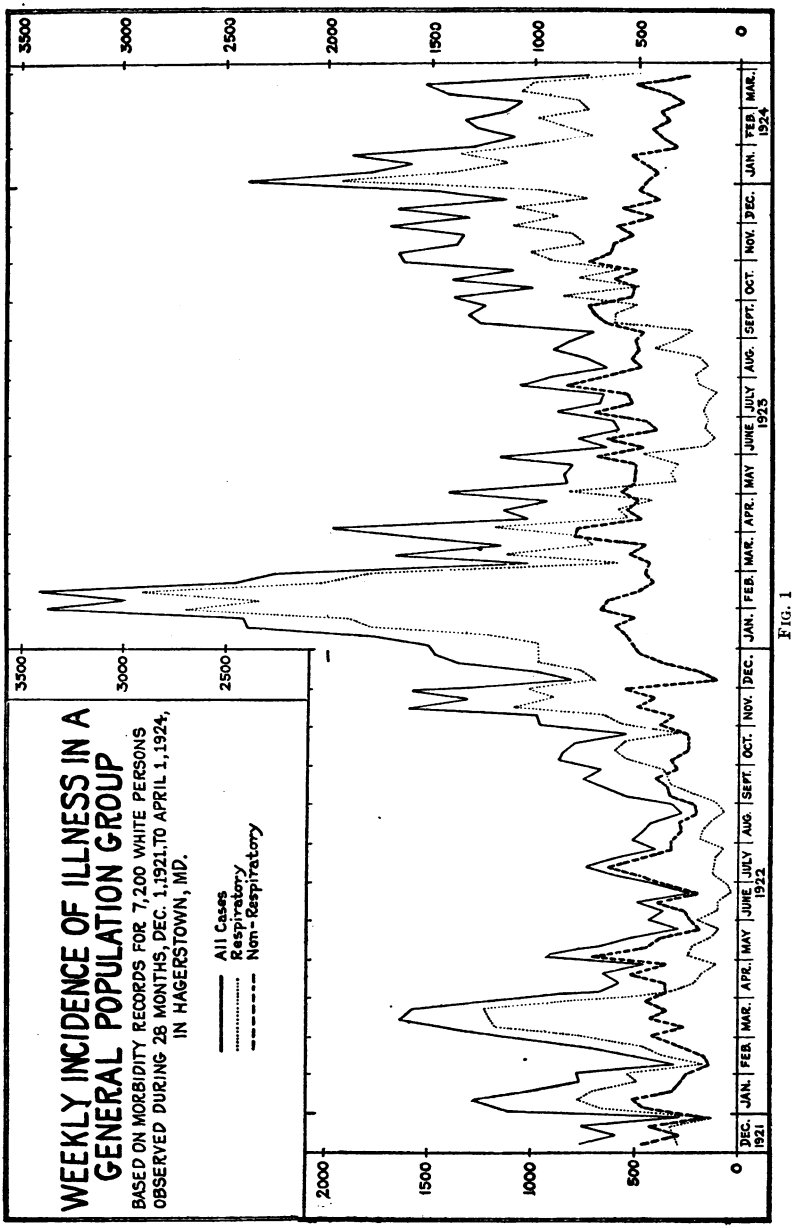
The relative *un*importance of the "general" diseases is clearly shown when we compare their incidence to that of all illnesses and especially of respiratory illnesses. This group of "general" diseases consists chiefly of the "common" diseases of childhood, as shown in Table 2.

TABLE 2.—*Morbidity from certain "general" diseases in a population group of 7,200 white persons of Hagerstown, Md., December 1, 1921–March 31, 1924*

[Numbers in parentheses refer to those given in International List of Causes of Death, 1920]

Disease	Number of illnesses	Annual rate per 1,000
Measles (7)	635	37.7
Scarlet fever (8)	35	2.1
Whooping cough (9)	377	22.4
Diphtheria (10)	42	2.5
Croup (10)	67	4.0
Chicken pox (25a)	253	15.0
Rheumatism, myalgia, lumbago (51–52; 158)	375	22.3
Other "General" diseases (1–6; 12–24; 25b; 25c; 26–30; 32–50; 53–69)	306	18.2

[1] The *prevalence* of respiratory diseases as indicated by various sickness surveys does not, of course, show the frequency of the occurrence (i. e., the *incidence*) of such diseases, for the reason that the "survey" is a cross-section, as it were, of the disease situation as it exists at a given instant in time. The shorter the duration of the attack of the disease in question the less adequate is the "cross-section" method as a measure of *incidence*.


WEEKLY INCIDENCE OF ILLNESS IN A GENERAL POPULATION GROUP
BASED ON MORBIDITY RECORDS FOR 7,200 WHITE PERSONS OBSERVED DURING 28 MONTHS, DEC. 1, 1921, TO APRIL 1, 1924, IN HAGERSTOWN, MD.
All Cases
Respiratory
Non-Respiratory
3500
3000
2500
2000
1500
1000
500
0
DEC. 1921
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
1922
AUG.
SEPT.
OCT.
NOV.
DEC.
JAN.
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MAY
JUNE
JULY
1923
AUG.
SEPT.
OCT.
NOV.
DEC.
JAN.
FEB.
1924
MAR.

FIG. 1

MORBIDITY AND MORTALITY COMPARED

A comparison of the 10 general groups of causes of morbidity and of mortality will emphasize the significance of the observation with which this report was introduced. A striking contrast in the pictures shown by sickness and death records is apparent:

TABLE 3.—*Morbidity and mortality in Hagerstown, Md., based on morbidity records for 7,200 white persons of all ages, and mortality among the total white population of Hagerstown, Md., during 28 months, December 1, 1921–March 31, 1924*

[Numbers in parentheses refer to those given in International List of Causes of Death, 1920]

Cause	Annual rate per 1,000		Per cent	
	Morbidity	Mortality	Morbidity	Mortality
All causes	1,131.5	10.6	100.0	100.0
Respiratory diseases and disorders (11; 31; 97–107; 109)	668.6	2.1	59.7	19.6
General diseases (1–10; 12–30; 32–69; 158) [1]	124.1	1.4	11.0	13.2
Diseases and disorders of the digestive system (108; 110–127)	117.2	.6	10.4	5.7
Diseases and disorders of the nervous system (70–84) [2]	46.8	1.2	4.1	11.2
Nonvenereal diseases of the genito-urinary system and annexa (135–150)	36.8	.3	3.3	2.4
Diseases and disorders of the circulatory system and kidneys and annexa (87–96; 128–134)	35.9	3.7	3.2	34.7
Accidents and other external causes (175–203) [3]	34.8	.5	3.1	5.1
Skin diseases and disorders (151–154)	22.8	(4)	2.0	.3
Diseases and disorders of eyes and ears (85–86)	20.8	(4)	1.8	.4
All other causes (155–157; 159–174; 204–205) [5]	16.6	.8	1.5	7.4

[1] See Table 2.
[2] Includes "headaches without other symptoms" (No. 205).
[3] "Fatigue" is not included (No. 192).
[4] Less than one-tenth of 1 per 1,000.
[5] Includes fatigue (No. 192).

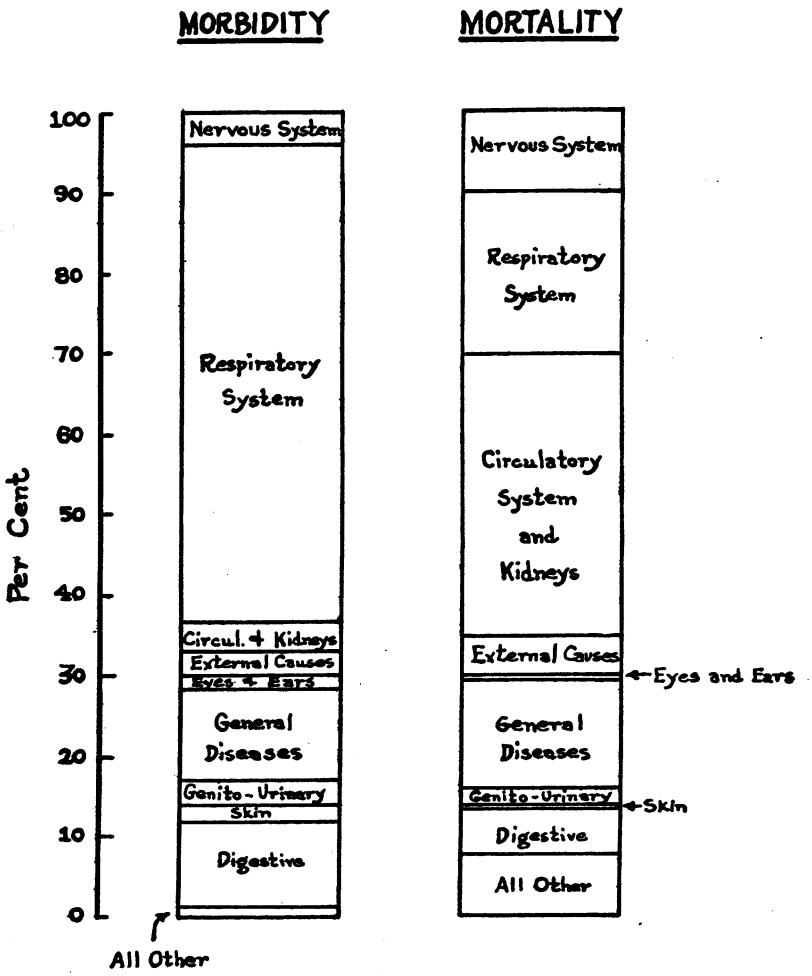
The relative importance of each of the 10 groups of diseases as causes of morbidity and mortality is indicated by the percentages in Table 3 and is graphically portrayed in the accompanying diagram (Fig. 2).

Further comment of a general nature is hardly necessary. The diseases that cause illness most frequently are respiratory (chiefly "colds" influenza, bronchitis, and tonsillitis), digestive disorders, and the "general diseases" (chiefly communicable diseases of childhood). The principal diseases which cause death are those which result in the breakdown of the circulatory system, the kidneys, the lungs, and the nervous system, and the malignant "general diseases," such as cancer. The difference in the two pictures may be shown in another way by estimating from the two sets of data the number of illnesses for each death, as in Figure 3.

Finally, we may compare the age curve for illness with the age curve for mortality. The graphs shown in Figure 4 have been placed on a common base (the rate for all ages); their variations only are comparable.[1] From this point of view the most important general

[1] The data used in Figure 4 are for 13 months instead of 28 months, the tabulations by age not having been completed for the entire period. The number of illnesses is sufficient to indicate the characteristic curve for illnesses of the degree of severity included in this study.

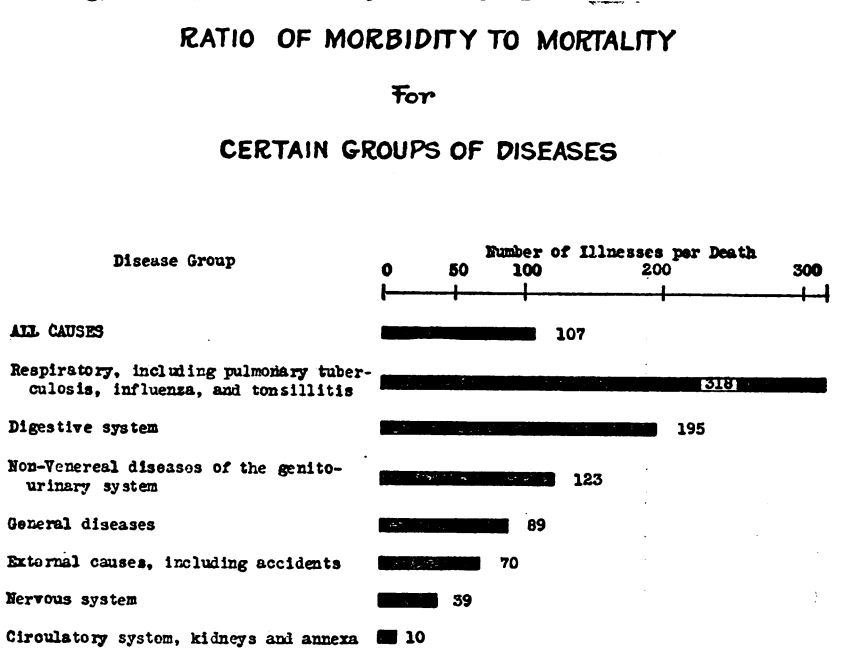
The Relative Importance of CERTAIN GROUPS OF DISEASES As Causes OF



Based on morbidity records for 7,200 white persons of all ages, and mortality among the total white population of Hagerstown, Md., during 28 months, December 1, 1921–March 31, 1924. See Table 1.

FIG. 2

contrast is in the character of the curves: the mortality curve exhibits the usual high points at the age of infancy and at old age and the, relatively, very low level in childhood and at early adult ages; the morbidity curve, on the other hand, shows no variations of such magnitude.[2] In other words, disease kills chiefly at two periods of life—in infancy and toward the end of the "natural span"—whereas disease, with far less discrimination, causes discomfort, suffering, illness, and disability at every age.



Based on morbidity records for 7,200 white persons of all ages, and mortality among the total white population of Hagerstown, Md., during 28 months, December 1, 1921–March 31, 1924. See Table 1.

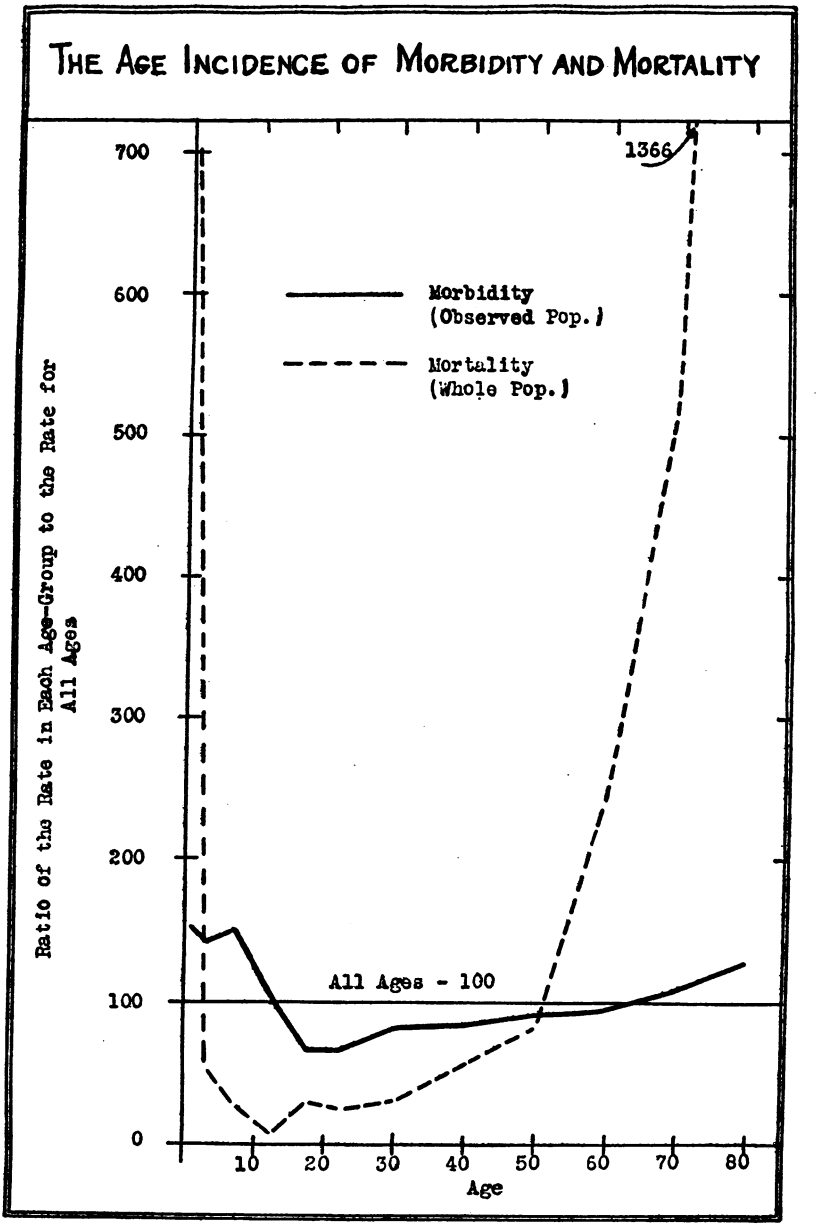
FIG. 3

Here again the inadequacy of mortality statistics as an index of health at different ages is clearly shown. If the annual number of illnesses be compared to the annual number of deaths[3] at different ages, we obtain the following approximate ratios:

Age group:	Number of illnesses per death
Under 5	60
5–14	550
15–24	200
25–44	150
45–64	50
65 and over	10

[2] It should be borne in mind that the smaller the proportion of slight illnesses the more will the morbidity curve tend to be similar to the mortality curve. In this instance, the records are not confined to severe or chronic illnesses but include practically all slight illnesses lasting more than two days.

[3] The morbidity rates for the canvassed population and the mortality rates for the entire white population of Hagerstown for the period December 1, 1921–December 31, 1922.



Based on morbidity records for 7,200 white persons observed for morbidity incidence, and mortality among the total white population, December 1, 1921-December 31, 1922, in Hagerstown, Md.

FIG. 4

In the light of this, it is difficult to refrain from remarking that if promotion of *health* is the first aim of public health work, the diseases that cause sickness rather than death demand first attention because they occur at the ages of adolescence and greatest usefulness.

The variations in the morbidity curve for age are extremely significant and invite more careful analysis. Our study shows that the highest illness rate is in childhood and that there is a marked drop until adolescence, when a gradual increase commences and continues throughout life. An analysis of these variations will require specific age rates for the different diseases. These will be presented in later papers and will, it is hoped, supply some of the details of the picture which has been sketched roughly here.

SUMMARY

A true picture of the ill health, and, therefore, of the problems to be attacked by those who are engaged in preventing disease, is not adequately portrayed by death statistics. The obvious reason for this is that mortality records by definition do not include the cases of illness that are not fatal, to say nothing of the suffering and the lowered vigor and the lessened efficiency among the living.

A study of illness in a general population group in a typical small city not only shows the inadequacy of mortality statistics for this purpose but suggests the kind of picture that complete morbidity records would afford. Looking at it in broad outline only, it was found in the group of persons studied that—

(1) Over 100 cases of illness occur annually for each death.

(2) More than half of the morbidity was due to respiratory diseases. The ratio of respiratory illnesses to deaths from respiratory causes was more than 300 to 1.

(3) Diseases and disorders of the digestive system caused an annual illness rate of 117 per 1,000 but a mortality rate of less than 1 per 1,000, a ratio of about 200 to 1.

(4) The "general diseases"—epidemic and nonepidemic—composed principally of those diseases against which public health effort has been mainly directed, caused only 11 per cent of all illnesses.

(5) While deaths occur principally in infancy and in old age, ill health, as measured by the incidence of illness, occurs with comparatively little variation throughout life. It is prevalent among the young, those in the "prime of life," and the aged without much discrimination.

This picture inevitably suggests a point of attack upon the causes of ill health not adequately recognized now—the diseases which are incident between the extremes of life. If, as it is now the custom, success of public-health work is to be measured in money terms, surely no more cogent argument could be put forward than that

of the economy of preventing loss of the efficiency of the population at those ages when health means the most in production. It is not hard to figure that a day of sickness prevented at the age of 30 or 40 is more profitable than at the age of 70. But, in a broader sense, the diseases which cause ill health are a challenge to the sanitarian, not merely because they have an exhausting effect upon man's power to resist death but because they lessen his ability to achieve and his capacity to enjoy life in the years of his most abundant strength.

ACKNOWLEDGMENTS

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STUDIES ON THE INDUSTRIAL DUST PROBLEM [1]

I. DUST INHALATION AND ITS RELATION TO INDUSTRIAL TUBERCULOSIS

By LEONARD GREENBURG, Associate Sanitary Engineer, United States Public Health Service, Office of Industrial Hygiene and Sanitation

That certain groups of persons are, by virtue of their occupation, exposed to excessive quantities of atmospheric dust and thereby suffer high rates of mortality from respiratory disease, was long ago noted by philosophers and students of industrial hygiene. Undoubtedly the earliest examples of exposure to hazardous dusts

[1] Thesis presented in partial fulfilment of the requirements for the degree of doctor of philosophy at Yale University.

must have been in connection with implement making, mining, quarrying, pottery manufacture, and the building of homes by such persons as the early cliff-dwellers. Sir Charles Lyell (1) and Dr. Isaac Taylor (2) have described the localization of prehistoric factories for the manufacture of flint instruments. Recently, Doctor Collis (3) has shown that the present flint-knappers of Brandon, the lineal occupational representatives of the group described by Sir Charles Lyell, suffer a severe mortality from phthisis induced by the flint dust generated in their work. More recently, Doctor Hoffman, in a communication entitled "Why the Cliff-Dwellers Vanished" (4), suggests continuous dust exposure in the making of stone implements, in the carving of shelters out of solid stone, and in the making of pottery, as a causative factor in the complete disappearance of this primitive population.

Hippocrates (5) speaks of the metal digger as a man who "has his right hypochondrium bent, a large spleen, and a costive belly; breathes with difficulty, is of pale, wan complexion, and is liable to swellings in his left knee." Pliny the elder (6), writing in the first century is, perhaps, the first to mention the use of protective devices for workers in the dusty trades. He says:

> Those employed in the works preparing vermillion cover their faces with a bladder skin, that they may not inhale the pernicious powder, yet they can see through the skin.

Georges Agricola, in De Re Metallica (7), discusses the hazards of mining as follows:

> Where water in shafts is abundant and very cold, it frequently injures the limbs, for cold is harmful to the sinews. To meet this, miners should make themselves sufficiently high boots of rawhide, which protect their legs from cold water; the man who does not follow this advice suffers much ill-health, especially when he reaches old age. On the other hand, some mines are so dry that they are entirely devoid of water, and this dryness causes the workman even greater harm, for the dust which is stirred and beaten up by digging penetrates into the windpipe and lungs, and produces difficulty in breathing, and the disease which the Greeks call ασθμα (asthma). If the dust has corrosive qualities, it eats away the lungs and implants consumption in the body; hence in the mines of the Carpathian Mountains women are found who have married seven husbands, all of whom this terrible consumption has carried off to a premature death. At Altenberg, in Meissen, there is found in the mines black pompholyx, which eats wounds and ulcers to the bone; this also corrodes iron, for which reason the keys of their sheds are made of wood. Further, there is a certain kind of cadmia (probably cobalt) which eats away the feet of the workmen when they have become wet, and similarly their hands, and injures their lungs and eyes. Therefore, for their digging they should make for themselves not only boots of rawhide, but gloves long enough to reach to the elbow, and they should fasten loose veils over their faces; the dust will then neither be drawn through these into their windpipes and lungs, nor will it fly into their eyes. Not dissimilarly, among the Romans the makers of vermillion took precautions against breathing its fatal dust.

Ramazzini, in his famous work on the "Diseases of Artificers and Tradesmen" (8), states that stonecutters "oftentimes suck in, by inspiration, the sharp, rough, and corner'd small Splinters or Particles that fly off; so that they are usually troubled with a cough, and some of 'em turn Asthmatick and Consumptive." He adds: "And in dissecting the corps of such Artificers, the lungs have been found stuffed with little Stones. Diemerbroek gives a curious Relation of several Stone-cutters that dy'd Asthmatick, and were open'd by him; in whose Lungs he found such heaps of Sand, that in running the knife through the Pulmonary Vesicles, he thought he was cutting some Sandy Body."

Thackrah, in his treatise on "The Effects of the Principal Arts, Trades, and Professions on Health and Longevity" (9), emphasizes the seriousness of respiratory disease in various dusty occupations. He states that miners in the north of England "suffer considerably when employed in ore in the sandstones, but are sensible of no inconvenience where the ore is in limestone." He cites a parallel condition among the grinders of Sheffield: "The fork-grinders, who use a *dry* grindstone, die at the age of 29 or 32, while the table-knife grinders, who work on *wet* stones, survive to between 40 and 50." Draw-filing of cast iron was at this time an exceedingly hazardous operation.

> The particles rise so copiously as to blacken the mouth and nose. The men first feel the annoyance in the nostrils. The lining membrane discharges copiously for some time, and then becomes preternaturally dry. The air tube is next affected. Respiration is difficult on any increase of exertion, and an habitual cough is at length produced. At the same time, the digestive organs become impaired; and morning vomiting, or an ejection of mucus on first rising, is not infrequent. The disorder varies of course with the constitution of the individual; but the common termination, when men pursue the employment for years, is bronchial or tubercular consumption.

In more recent times, the statistics of industrial tuberculosis among steel grinders at Sheffield, England, and at Solingen, Germany, have been widely quoted in many of the textbooks and monographs upon this subject.

AMERICAN STUDIES OF THE RATIO OF TUBERCULOSIS DEATHS TO TOTAL DEATHS IN VARIOUS INDUSTRIES

Data obtained in regard to the prevalence of occupational disease in different countries and at different periods of time must be interpreted with the greatest caution, on account of the fact that industrial processes differ so widely and change so frequently. Recent statistics for the United States are necessary to throw a clear light on this problem; and such data, in order to be of conclusive value, should be available in the form of actual death rates, based on knowledge of the population exposed as well as on the number of deaths occurring, and properly corrected for the age distribution of the group involved.

Unfortunately, such complete statistical data as we desire are difficult to obtain in the existing state of American vital statistics, exact knowledge of the population at risk in a given occupation, classified by age, being obtainable only with great difficulty and by special and intensive research. For the most part, therefore, students of this subject have fallen back on an indirect index of the tuberculosis death rate, in the form of a ratio between deaths due to tuberculosis and those due to all causes. Data of this sort may, of course, be obtained with ease from the mortality records in any registration office or actuarial department.

Three important studies of this kind have been made in the United States during the past decade. The first of these is contained in bulletins of the United States Bureau of the Census giving the proportionate mortality by occupations of the population of the registration area for 1908 and 1909. The second is a bulletin on the industrial experience of the Metropolitan Life Insurance Co., by L. I. Dublin, published as Bulletin 207 of the United States Bureau of Labor Statistics (10). The third and most extensive collection of statistics of this type is contained in a series of exhaustive monographs by F. L. Hoffman, of the Prudential Insurance Co. of America, the last and most important of which was published in 1918 as Bulletin 231 of the United States Bureau of Labor Statistics (11).

In the analysis of statistical data of this kind, it is clearly most important that the groups under consideration be fairly comparable, so that the effect of industrial hazards will not be complicated by the influence of social and economic factors of a more general nature. In Doctor Hoffman's studies, for example, ratios presented for the various dusty trades are based on the industrial experience of the Prudential Insurance Co., but Doctor Hoffman uses as a norm for comparison the ratio for males in the registration area obtained from the data of the United States Census Bureau. On this basis almost all the industries which he tabulates show a surprisingly high tuberculosis ratio, including many trade designations of workers, such as "iron and steel workers," who can hardly be considered as generally exposed to a serious dust hazard. These results, as presented in the earlier publications of the Prudential Insurance Co., aroused the suspicion that the whole group covered by industrial policies might be a selected one, and in the report of Doctor Hoffman cited above (11), the solution to the problem is at last presented. In this report as a whole the old comparison is presented of tuberculosis ratios in each "dusty" trade among industrial policy-holders, with the ratio for all males in the registration area; but in one place (Table 11, p. 56) Doctor Hoffman gives the ratios for all occupied males in the Prudential experience. From this table it appears that the industrial policy-holder group does, as

a matter of fact, exhibit a consistently higher ratio for all occupied males, irrespective of exposure to dust. Doctor Hoffman's abnormally high ratios are, therefore, probably due to the general social and economic conditions of the wage-earner's life and to the fact that the group is an industrial one.

TABLE 1.—*Ratios, in per cent, of tuberculosis deaths to total deaths in occupations exposed to mineral and metallic dusts* [1]

Occupation groups	United States registration area, age groups						Prudential experience, age groups					
	15–24	25–34	35–44	45–54	55–64	15 and over	15–24	25–34	35–44	45–54	55–64	15 and over
All occupied males	28.1	30.9	24.0	14.4	7.6	14.9	33.2	40.9	32.9	19.0	8.8	20.5
Brick, tile, and terra cotta workers							22.9	35.3	19.8	18.6	10.7	15.6
Iron and steel workers	19.8	26.1	23.3	16.7	8.5	16.9	30.0	34.1	31.3	14.7	8.7	21.0
Plasterers	25.0	31.5	34.5	16.4	7.8	16.7	34.5	43.6	40.4	23.5	11.8	21.9
Molders							23.7	40.4	30.7	21.6	13.9	23.0
Paper hangers							35.1	44.0	42.5	15.7	11.5	29.1
Painters, glaziers, and varnishers	30.8	36.9	29.2	17.4	9.0	18.7						
Tinplate and tinware workers	39.4	36.7	34.8	13.7	6.6	18.7						
Jewelers	50.0	39.7	23.4	14.1	8.5	17.8	50.9	58.3	45.3	21.2	11.1	29.3
Glassblowers							45.1	53.3	31.3	28.3	15.4	32.1
Other glassworkers							31.5	51.1	34.4	23.1	15.5	30.5
Glassworkers	47.2	42.6	33.1	19.7	7.9	30.0						
Tool and instrument makers							37.5	52.7	36.9	33.7	10.4	31.9
Potters							31.2	49.6	39.8	30.2	21.1	32.2
Marble and stone cutters	26.2	43.5	44.1	41.6	23.3	30.7	38.3	51.1	44.4	39.0	26.7	33.6
Brassworkers							58.2	51.0	43.8	24.2	16.1	36.7
Compositors and typesetters							46.3	55.9	41.1	24.9	9.8	36.8
Pressmen							42.9	47.7	44.0	20.0	11.1	39.6
Printers, lithographers, and pressmen	43.6	50.0	36.3	21.5	7.7	29.5						
Polishers							43.4	56.1	44.0	24.9	14.3	36.8

[1] The figures given are taken from Bulletin No. 231, Bureau of Labor Statistics, United States Department of Labor.

This constant difference between the Prudential figures and the census data is clearly brought out in Table 1, which has been compiled from the tables in Doctor Hoffman's bulletin so as to include all the industries exposed to metallic or mineral dusts, for which 500 or more deaths from all causes at all ages were available. It is evident that in almost every instance in which the two series can be compared, the Prudential ratios are from 25 to 50 per cent higher than those for the registration area.

It seems evident that a comparison between the Prudential figures for a given dusty trade and the census figures for all occupied males is not a fair one, and that the conclusion indicated by such a comparison—namely, that such groups as the iron and steel workers experience an excessively high death rate from tuberculosis as a result of the dust hazard—is unwarranted. As a matter of fact, comparisons made in each case with the corresponding groups—census figures for a dusty trade with census figures for all occupied males, or Pru-

dential figures for a dusty trade with Prudential figures for all occupied males—show that the tuberculosis ratio for the iron and steel workers is about normal, as might be expected for so diversified an occupational group.

Comparing specific trades in the Prudential experience with the Prudential group as a whole, and comparing specific trades in the registration area with the registration group as a whole, both sets of data are highly illuminating and bring out very clearly the excessive tuberculosis ratios characteristic of certain occupations. The two sets of figures, allowing for the constantly higher ratios throughout the Prudential experience, check each other very closely, even in such details as the concentration of the highest ratios at ages under 35 among jewelers, and at ages over 35 among marble and stone cutters.

It is interesting to notice that Doctor Dublin's statistics for the industrial experience of the Metropolitan Life Insurance Co. (10) correspond almost exactly with the Prudential figures. For all males in the Metropolitan experience, the ratio of tuberculosis deaths to total deaths was 33.8 per cent at ages 15–24; 40.9 per cent at ages 25–34; 32.9 per cent at ages 35–44; 18.5 per cent at ages 45–54; 8.6 per cent at ages 55–64; 2.9 per cent at ages 65 and over; and 20.5 per cent for all ages over 15.

These figures are almost identical with those presented in the upper line of the right hand half of Table 1, and it is evident that the ratios shown are characteristic of the industrial group as a whole.

Even when comparisons are made in the correct manner between a dusty trade and an average group of as nearly as possible the same general social and economic status, there must always be a large measure of doubt in regard to the significance of high tuberculosis ratios. Ratios, as distinct from rates, depend on two independent variables, and a high ratio of tuberculosis deaths to total deaths may be produced by a low mortality from other causes, as well as by a high mortality from tuberculosis. Thus, the tuberculosis ratio among female college professors and teachers, according to Dr. G. M. Kober (12), is high—a ratio which Doctor Kober attributes to the alleged fact that the teaching profession is "usually recruited from weak stock." Prof. L. M. Terman, in his book on "The Teacher's Health" (13), has also given currency to the view that teachers suffer to an exceptional degree from tuberculosis. The only careful statistical study of this subject with which I am familiar, Dr. L. I. Dublin's paper on "Physical Disability of New York City School Teachers" (14), shows that this conception is erroneous. The high ratio of tuberculosis deaths to total deaths among teachers is shown in this investigation to be due to the fact that the death rate from causes other than tuberculosis in this group is exceedingly

small, the tuberculosis rate itself being less than two-thirds of the rate prevailing among females in the community at large, at the age of 15 and over.

STUDIES OF THE ACTUAL DEATH RATES FROM TUBERCULOSIS IN VARIOUS DUSTY TRADES

It is by no means intended to discredit all use of mortality ratios, and still less to throw doubt upon the real importance of the problem of industrial tuberculosis. We desire only to emphasize the possible fallacies in the use of ratios and the necessity for controlling deductions by the determination of actual death rates wherever possible.

In England numerous statistics are available which indicate that in many industrial employments, such as metal mining, marble and stone cutting, and grinding and polishing, high tuberculosis ratios are associated with high tuberculosis rates. In Table 2, for example, are presented the data for occupations exposed to metallic dusts, from the Sixty-Fifth Annual Report of the Registrar-General, rearranged and supplemented by ratio computations. They show that the excessive ratios of tuberculosis deaths to total deaths indicate an actual excess death rate from tuberculosis of one to two persons per thousand population; while at the later age periods, the death rate from causes other than tuberculosis among the workers exposed to the influence of metallic dusts is also well above the normal rate.

TABLE 2.—*Mortality from pulmonary tuberculosis and other causes in occupations exposed to metallic dust, compared with that of all occupied males, England and Wales, 1900–1902.*

Age period	All occupied males				Occupations exposed to metallic dusts			
	Deaths per 1,000			Per cent due to tuberculosis	Deaths per 1,000			Per cent due to tuberculosis
	Total	Tuberculosis	Other causes		Total	Tuberculosis	Other causes	
15–19	2.4	0.5	1.9	22	2.7	0.7	2.0	27
20–24	4.4	1.5	2.9	35	5.3	2.7	2.6	52
25–34	6.0	2.0	4.0	34	6.3	3.3	3.0	53
35–44	10.2	2.7	7.5	27	11.7	5.0	6.7	43
45–54	17.7	3.0	14.7	17	21.0	5.2	15.8	25
55–64	31.0	2.2	28.8	7	36.0	3.9	32.1	11
65 and over	88.4	1.1	87.3	1	95.5	1.5	94.0	2

The earlier reports of the medical officer of health of the city of Sheffield contain particularly significant data in regard to the mortality in the intensively hazardous processes of the cutlery industry. The report for 1910, for example, shows a mortality from pulmonary tuberculosis among grinders of 14.8 per thousand for the age of 18 and over, as compared with a rate of 2.7 for all occupied males of

the age of 20 and over. The corresponding mortality from all other causes was 15.1 per thousand for grinders and 13.7 for all occupied males; the ratio of tuberculosis deaths to total deaths was 49 per cent for grinders and 16 per cent for all occupied males.

We may cite one more example from the field of British industry, presented in the Report of the Departmental Committee on the Dangers Attendant on the Use of Lead and the Danger or Injury to Health Arising from Dust and Other Causes in the Manufacture of Earthenware and China (15). Dr. G. Reid, of Stafford, presents the following computation (Table 3), which indicates that even in a trade like pottery making, which is generally considered as one of the industries most affected with plumbism, lead poisoning is far less important as a factor in the death rate than is industrial tuberculosis.

TABLE 3.—*Mortality from plumbism and respiratory diseases among Staffordshire potters*

Nature of industrial illness	Number of workers exposed to risk	Average annual deaths attributable to employment	Annual death rate per 1,000
Lead poisoning	5,299	4	0.8
Pulmonary tuberculosis and other respiratory diseases	21,000	148	7.0

In the United States we have a few—but only a very few—data of this kind which show the actual death rates from tuberculosis in employments exposed to the hazards of industrial dusts. The only general collection of statistics of this sort with which we are familiar was presented in a special bulletin on "Tuberculosis in the United States," prepared by the Bureau of the Census for the meeting of the International Congress of Tuberculosis, held in Washington in 1908. The highest and the lowest rates included in this tabulation are presented in Table 4, and they are suggestive and interesting, although the absence of an analysis by age periods detracts seriously from the value of the results, as does the fact that the occupational groups are large and often loosely defined. The high rates among cigarmakers and tobacco workers, compositors, printers and pressmen, servants, bookkeepers, clerks and copyists, and the low rates among bankers, brokers, and officials of companies are no doubt in large measure due to the age composition of the respective groups. In the high rate among servants the racial factor must certainly play an important part.

Important data in regard to the effect of mineral dusts upon the tuberculosis rate have recently been presented in the "Second Preliminary Report of the Committee on Mortality from Tuberculosis in Dusty Trades" (16), which deals primarily with conditions in the

quarrying districts of Vermont. We have presented in Table 5 certain selected data from this report which indicate that in towns, and even in entire districts, where a considerable proportion of the population is exposed to mineral dust, the tuberculosis death rate for the entire administrative unit may be increased far above the normal value.

TABLE 4.—*Mortality from tuberculosis in certain occupations in the registration States for the age of 10 years and over, 1900*

Occupation	Deaths per 100,000	Occupation	Deaths per 100,000
Marble and stone cutters	540.5	Steam-railroad employees	129.8
Cigarmakers and tobacco workers	476.9	Clergymen	125.5
Compositors, printers, and pressmen	435.9	Miners and quarrymen	120.9
Servants	430.3	Farmers, planters, and farm laborers	111.7
Bookkeepers, clerks, and copyists	398.0	Lumbermen and raftsmen	107.1
Laborers (not agricultural)	370.0	Bankers, brokers, and officials of companies	92.1
All occupied males	236.7		

TABLE 5.—*Mortality from tuberculosis of the lungs in quarrying districts of Vermont, 1906–1915*

District	Tuberculosis death rate per 100,000 population	District	Tuberculosis death rate per 100,000 population
State of Vermont	90.6	Town of Dorset (marble center)	149.4
Granite-cutting districts	143.0	Slate districts	111.3
Barre City (granite center)	233.2	Town of Castleton (slate center)	176.0
Marble districts	97.1		

A comprehensive study of this kind conducted by Dr. Herbert Drury (17) deals with the incidence of tuberculosis among the employees of an ax factory in the State of Connecticut. The factory in question employs about 800 men and is situated in a rural community where other industrial activities are largely agricultural. The vital statistics for the four adjacent towns in which the operatives might reside have been analyzed in detail for a period of 20 years, and each death certificate for tuberculosis or other respiratory disease has been transcribed and investigated. The fact that the medical consultant of the ax factory and the superintendent had both been in the employ of the company during the two decades covered by the investigation made it possible to trace out practically every death certificate, and to determine the actual occupation of the deceased. The final analysis of the results yielded the astonishing figures presented in Table 6.

Thus, we find the entire population of the mill district showing a tuberculosis rate of 200, as compared with 150 for the State as a whole. The mill population itself has a rate rising to 650, and the

group of polishers and grinders the astounding rate of 1,900. The other employees of the mill are not entirely comparable in age, race, and general social and economic status with the polishers and grinders, but it is evident that the high death rate among the polishers and grinders, who suffer from a tuberculosis death rate over ten times the normal rate, is primarily due to the hazards of their occupation. Nor is tuberculosis the only form in which they pay a penalty for their hazardous employment. Doctor Drury reports that the mortality from pulmonary infections other than tuberculosis for the period 1900 to 1919 was 430 per 100,000 for the polishers and grinders, as compared with 170 for the other employees of the ax factory.

TABLE 6.—*Mortality from tuberculosis of the lungs in a Connecticut ax factory, 1900–1919*

District or group	Death rate per 100,000	District or group	Death rate per 100,000
State of Connecticut	150	Employees of ax factory (all)	650
State of Connecticut (male population)	170	Employees of ax factory, polishers and grinders	1,900
Ax factory district (3 towns, entire population)	200	Employees of ax factory, others	160

Mention must be made of a recent and intensive study of this subject by Dr. F. L. Hoffman (18), among the granite cutters of Washington and Caledonia Counties of the State of Vermont. This study, in which the mortality data for 26 years were analyzed, included the study of 18,406 death certificates; sanitary surveys were made of the homes and working places of the groups studied, the anthropometric status of 1,869 persons engaged in the industry was determined, and lastly, intensive physical examinations and X-ray pictures of 427 of the men were made.

This study disclosed the fact that the granite-stone industry is carried on by wage earners who live under sanitary conditions above the average, whose housing conditions are above the average, and whose anthropometric status is indicative of a superior physique. Yet this group suffers from a very high mortality for tuberculosis, as disclosed in Table 7.

Doctor Hoffman at one point tersely summarizes his conclusions as follows:

> The general conclusions derived from these data would therefore seem to support the theory that granite cutters in the State of Vermont are subject to an excessive frequency of death from pulmonary tuberculosis, not because of an exceptional risk of contact infection, or because of inferior physique, or because of unfavorable housing conditions or other sanitary deficiencies, but primarily because of the occupational exposure, which in its final analysis is reduced to the dust hazard resulting from the excessive use of pneumatic tools.

TABLE 7.—*Mortality from pulmonary tuberculosis among granite cutters, compared with that of the general adult population of Vermont, 1896 to 1918, by 5-year periods*

[Data for granite cutters taken from experience of the Granite Cutters' International Association]

Granite cutters				General adult population (20 years of age and over)		
Period	Number exposed	Deaths	Death rate per 100,000	Aggregate population	Deaths	Death rate per 100,000
1896–1899	5,584	22	394.0	862,468	1,636	189.7
1900–1904	10,747	38	353.6	1,099,708	1,821	165.6
1905–1909	14,594	105	719.5	1,120,253	1,669	149.0
1910–1914	17,103	137	801.0	1,140,798	1,370	120.1
1915–1918 [1]	12,494	133	1,064.5	694,341	752	[2] 108.3

[1] Exclusive of last three months of 1918.
[2] 1915–1917.

THE SPECIFIC INFLUENCE OF PARTICULAR INDUSTRIAL DUSTS IN RELATION TO TUBERCULOSIS

It is an interesting and significant fact that in every instance, as far as we are aware, in which a heavy incidence of tuberculosis has been clearly shown to result from exposure to industrial dust, the dust in question has been in part at least made up of crystalline rock. It is silicosis which lies at the basis of miners' phthisis, and silicosis is probably the chief predisposing factor in tuberculosis among ax grinders, although in grinding and polishing, steel dust may, and probably does, play a part as well. No such striking statistical results as those cited for mining, quarrying, and grinding, and pottery making have yet been presented for industries where crystalline rock particles were not involved. But silica dust is not looked upon as the predisposing agent only in the cases where it is present in excessive quantities. It is, indeed, being pointed out as the harmful agent even in those cases where it is present in smaller and less significant amounts. Recently this very question has been under discussion. Dr. E. H. Ross, in an interesting letter in the London Daily Times quoted by Doctor Hoffman (19), attributes the excessive mortality from phthisis among printers to silica dust present in the printers "list." It is to be remarked in passing, however, that in the minds of many workers in the field, the existence of quantities of silica dust sufficient to cause the excessive phthisis rate in the printing trades is not proved beyond doubt (20), (21).

Turning now from the consideration of silica dust—of major importance in the problem of industrial tuberculosis—to other kinds of dusts, we find a strikingly different picture.

Thackrah (9) points out that bricklayers, lime workers, and plasterers and whitewashers, all of whom are exposed to lime dust, suffer from it no sensible injury (pp. 46 and 47). Reckzeh (22) investigated the relation of lime-dust inhalation to pulmonary tuberculosis

and found that tuberculosis was rare in lime-producing districts. Selkirk, quoted in the Journal of the American Medical Association (23), also found phthisis to be rare among lime workers. He is so firm in his belief as to the beneficial effects of lime dust that he even hints at the organization of lime works as curative tuberculosis colonies. Recent work in Japan has confirmed the findings of Reckzeh and Selkirk: Nagai (24) found tuberculosis to be uncommon among workers about lime kilns, and also that lime dust had no detrimental effect on the lung tissue of guinea pigs subjected to it.

Ample evidence is at hand to show that the inhalation of cement dust also does not predispose to tuberculosis. In this industry enormous amounts of dust are found in the grinding and sacking rooms, so that there exists no question as to definite dust exposure. Dr. G. E. Tucker (25) studied the problem at a cement mill in California. He concluded:

> As a result of an investigation of the dust problem in conjunction with the manufacture of Portland cement, based upon the review of literature on the subject, the examination of 956 employees in one plant, examinations of men employed in the dusty departments of four other mills, the medical records of employees and guinea pig experimentation, there appears to me to be no evidence of injurious effects from cement dust upon employees engaged in its manufacture.

The clearest and most striking case, however, is that of coal dust, which, if it has any effect, appears to exert a protective influence against the development of active tuberculosis. A clearly marked fibrosis (anthracosis) follows the inhalation of coal dust, a condition which appears to favor a high mortality from acute respiratory disease; but the tuberculosis death rate among coal miners is uniformly and characteristically low. The figures presented in Table 8, below, from Doctor Hoffman's study (11), bring out the typical relation with great clearness.

TABLE 8.—*Mortality in coal-mining districts of Pennsylvania*

District	Death rate per 100,000		
	Pulmonary tuberculosis	Other forms of tuberculosis	Other respiratory diseases
Scranton	79.9	16.6	261.2
Wilkes-Barre	74.9	19.4	212.5
Remainder of State	110.5	16.4	184.2

That coal miners suffer a high mortality from acute respiratory diseases has been noted by many workers in this field. Wainwright and Nichols (26), Collis (27), and lastly, Doctor Dublin (28) have made this point very clear and practically incontrovertible.

Doctor Dublin, in his paper, presents the following very interesting table:

TABLE 9.—*Influenza-pneumonia mortality among bituminous coal miners, October to December, 1918, compared with all occupied white males, Industrial Department, Metropolitan Life Insurance Co.*

Age period	Annual death rate per 1,000	
	Bituminous coal miners	All industrial white males
All ages	50.1	22.3
15–25	29.5	17.5
25–45	62.1	32.6
45–65	44.4	11.7

And lastly, the occupational statistics presented by the Registrar-General of Great Britain include a particularly striking comparison between coal miners and tin miners, the former exposed to coal dust, the latter to hard crystalline dust. The comparative mortality figures for tuberculosis in 1900–1902 were 186 for all occupied males, 85 for coal miners, and 838 for tin miners.

LABORATORY STUDIES ON THE INFLUENCE OF PARTICULAR DUSTS IN RELATION TO TUBERCULOSIS

In addition to the statistical studies referred to in the previous portions of this paper, studies which aim to demonstrate the effects of particular dusts in relation to tuberculosis, there exists another type of evidence, namely, animal experiments, which in some cases casts much light on this question.

Reference has previously been made to the work of Nagai (24), who found that lime dust had no detrimental effect on the lung tissue of guinea pigs subjected to it. Middleton (29) quotes the results of the experimental work of Beattie, in which it was found that exposure of animals to limestone dust produced no increased susceptibility to tuberculosis. And recently, Gardner and Dworski (30) have reported the results of a very interesting series of experiments on the effects of the inhalation of marble dust (the particular sample used contained 3.5 per cent of insoluble residue). It was found as a result of these experiments that the test animals, after long exposure, develop a moderate silicosis (due probably in some measure to the silicious matter in the dust), which rendered the lung tissue more susceptible to tuberculosis, with a consequent more chronic type of tuberculosis and a definite delay in resolution. Obviously, if the effect of limestone is to be clearly defined, the silica content of the dust used must be practically nil. On the other hand, this series of experiments clearly discloses the well known fact that

it is possible with animal experiments to discern finer differences in the effects of dust than by a statistical method. Cesa-Bianchi (31) exposed animals to cement dust largely composed of lime and found that this dust greatly increased the susceptibility to tuberculosis. In striking contrast to this finding, however, is the work of Tucker (25) which was previously mentioned. Tucker exposed guinea pigs to the dust in a cement plant. The raw mix at this plant consisted of approximately 76 per cent of a $CaCO_3$ and 15 per cent silica. The final cement was composed of about 63 per cent CaO and 23 per cent of silica. As a result of his experiments Tucker decided that the dust in question had no detrimental effect on health. It is to be noted that in the experiments of Gardner and Dworski the animal exposures were carried out over a long period of time, in some cases as long as ten months, while Tucker used a shorter period of dusting.

Animal experiments on the action of coal dust with respect to pulmonary lesions have yielded rather clear-cut results. Mavrogordato (32) found that coal dust was rapidly eliminated from the lung with moderate dusting. For example, he found that the lungs of guinea pigs might pass for normal at the end of one year. On the other hand, he found that with intense dusting, coal dust behaved in its action as other more harmful dusts. And in a second communication (33) he quotes some experiments which indicate that coal dust, when mixed with silica dust, may even prevent, by rapidly eliminating the silica dust from the lung, the formation of pathological lesions in the lung, which would ordinarily ensue if silica dust alone were breathed by the experimental animals. Willis (34) also found, in a series of experiments similar to Mavrogordato's "intense exposure" series, that after infection, tubercles develop somewhat more abundantly in lungs of animals exposed to coal dust than in those of normal animals. The ratio of tubercle development in the two types was found by him to be as three to two.

Of all the experimental work on the effects of various dusts, silica has yielded the most conclusive results. It has been found by Mavrogordato (32) (33) that the inhalation of silica dust gives rise to long-continued chronic changes in the lung; the work of Gardner (35) on this dust has yielded the same results. Gardner used dust of dark Barre granite consisting of nearly 70 per cent silica. This was suspended in the atmosphere of a special dusting chamber in which the animals were placed, the animals being exposed for periods of from 36 to 48 hours per week for 2 to 7 months. Gardner concluded that the occurrence of tubercles is more frequent in dusted than undusted lungs and that such lesions in dusted animals tend to run a more prolonged course than those in animals not exposed to dust but otherwise similarly treated.

As bearing on the reasons for the above-noted phenomena, a very interesting series of experiments may be cited. Fenn (36) has found from experiments conducted *in vitro* that carbon is ingested by phagocytes about four times as readily as quartz, and that this difference in the ingestion rates increases as phagocytic action increases. The reasons for the specific harmful effects may well be connected in some manner with this phenomenon.

THE PATHOLOGY OF DUST INHALATION

In describing the end results of dust inhalation, many medical terms have come into use; and by the indiscriminate use of these terms much confusion has been brought about in the literature of this subject. An examination reveals the fact that such terms as "miners' phthisis," "silicosis," "industrial tuberculosis," and "pneumoconiosis," are used to replace each other without careful consideration of the exact process at hand.

The inhalation of air charged with dust gives rise to the presence of certain quantities of dust in the lung. This condition is perhaps best described by the word "pneumonoconiosis" (built from the Greek roots meaning *lung* and *dust*). When, as is usually the case, the dust has come into the atmosphere through a particular industrial process and the persons who acquire it are industrially employed, the condition is best referred to as "industrial pneumonoconiosis." The term "industrial pneumonoconiosis" conveys no idea as to the particular dust breathed by the workers, and for this reason other and more descriptive terms have come to be employed in referring to the results of the inhalation of specific dusts, the term silicosis referring to the effects produced by the inhalation of silica dust, anthracosis, of coal dust, and siderosis, of iron dust.

The development of the stages in silicosis has been well described by the South African workers (37), from whom I have borrowed freely in the following description. When heavily dust-laden air is breathed, the natural defenses of the body prevent the dust from gaining free access to the lungs. It is only when the filtering ability of the nasopharyngeal passages is overtaxed by comparatively large quantities of dust that some finds its way into the alveoli of the lungs. The irritation caused by the dust in this situation leads to a proliferation and shedding of the epithelial cells which line the alveolar walls. The larger of these cells appear to be actively phagocytic and take up the dust with great avidity. They may be detected in the alveoli and also in the alveolar walls. Drinker (37), in an interesting summary of the development of lung fibrosis, cites the work of Permar, which indicates that the actively phagocytic cell is of endothelial origin instead of epithelial origin, as suggested in the

South African studies. It is not the object of this paper to attempt so detailed an analysis of this question as Drinker has set forth, but it is to be noted in passing that at this time even his complete summary has failed to present a definite conclusion on this point. To continue, many of these dust-laden cells, whatever their origin, pass into the bronchi and are expelled in the expectoration, while others penetrate the alveolar walls and reach the lymph spaces, whence they are carried along the lymph channels to the adjacent lymph tissue, where they are lodged. Some may even continue further along the lymph channels to be arrested in the larger bronchial glands at the root of the lung. Fibrosis appears to begin about the collections of dust cells in the smaller lymph tissue islands. The presence of aggregations of mineral particles at these points leads to a proliferation of the connective tissue cells, a normal protective reaction. The fibroid changes then display themselves as irregular beadings along the course of the perivascular and peribronchial lymphatics. As this fibrous tissue increases in amount it tends to produce an obstruction to the lymphatics in the affected area, leading in turn to a further increase in dust accumulation. The interstitial fibrosis caused by the mineral particles then becomes more diffuse, with a consequent thickening of the alveolar walls, the interlobular septa, the adventitia of the smaller vessels, and the bronchioles. In the early stages of silicosis diffuse changes are not marked; the process is mainly perivascular and peribronchial. In the later stages the process proceeds to the larger bronchi and larger vascular trunks and also to the subpleural lymph channels, where similar fibroid changes are produced in the subpleural tissue. Later on, constriction and even obliteration of the alveoli may take place. The important feature of the advanced stage of silicosis is the production of the large areas of fibroid consolidation. These larger areas arise, according to the South African workers, either through consolidation of smaller silicotic areas, or, secondly, by means of a massive increase and extension of the diffuse fibrosis, or, lastly, by means of tubercular complications. It is important to note that this massive consolidation is usually associated with a high mortality rate.

The exact reason for the ease with which this tissue may become infected is still under dispute. The South African workers do not, so far as I am aware, ascribe it to one cause, but rather to a combination of all the above-mentioned fibroid changes. According to a personal communication quoted by Gardner (35), "Krause would explain the increased susceptibility to tuberculosis infection of a lung previously exposed to dust on an anatomic basis; that is, as due to mechanical blocking of the lymphatics which provide means of exit from the lungs. Tubercle bacilli then entering such a lung can not

be eliminated as under normal conditions and they remain within the tissue, proliferate, and produce widespread lesion." Recently a rather newer view has been brought to bear on this question. According to this view, colloidal silica possesses poisonous properties. It has been shown by Cummings (39) that colloidal silica possesses marked power of inhibiting the action of complement. And later, Gye and Kettle (40) have shown that when a mixture of silica dust and tubercle bacilli is injected into a mouse subcutaneously, the silica breaks down the normal defense mechanism, permitting a sufficient number of organisms to remain alive to cause later a chronic infection. And these workers further maintain that although the subcutaneous injection of carbon blocks the lymphatics and produces a fibrosis, this fibrosis is nevertheless not the type produced by silica dust. They say, "The silica fibrosis is an end-result of a tissue destruction which can not be produced by carbon."

And finally, the question as to the time necessary to produce these pathological changes in the lung. Doctor Hoffman (18) presents a very interesting table, a portion of which follows:

TABLE 10.—*Mortality from pulmonary tuberculosis among the granite cutters of Barre, Vt., by years of exposure to granite dust, 1886 to 1919*

Exposure to granite dust (years)	Number of deaths	Exposure to granite dust (years)	Number of deaths
1		19	23
2		20	23
3	2	21	27
4	4	22	23
5	7	23	25
6	5	24	23
7	3	25	16
8	2	26	21
9	10	27	17
10	10	28	11
11	16	29	12
12	7	30	7
13	11	31	4
14	13	32	3
15	16	33	1
16	21	34	
17	19		
18	17	Total	399

In his summary (p. 2) Doctor Hoffman says:

The investigation brings out clearly the supremely important fact that the incidence of the lesion is practically proportionate to the length of trade life.

In conclusion, it would appear that the injurious effects of the inhalation of a particular harmful dust are proportional to the amount of dust breathed, this resolving itself into the important consideration of the duration of trade life and the quantity of dust suspended in the atmosphere.

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SMALLPOX AND VACCINATION

The instructive items printed below show the efficacy of successful vaccination in giving protection against smallpox, and emphasize the necessity for the fight that State and municipal health departments are maintaining against the disease, particularly with reference to the education of health workers and the people generally in the simple lesson of vaccination and revaccination.

The following is taken from a recent issue of the Health News, published by the New York State Department of Health:

"Statistics recently compiled by the division of communicable diseases, State Department of Health, illustrate in a vivid manner the relation of vaccination to the prevention of smallpox.

"The average morbidity rate for smallpox in the State, exclusive of New York City, in the years 1914–1924, inclusive, was 7.6 per 100,000 population. Under the existing law, vaccination is a prerequisite to school attendance in first and second class cities only. A larger proportion of the populations of these cities has therefore been vaccinated than in the rest of the State. In first and second class cities, the average rate for smallpox was only 3.1 per 100,000 as compared with a rate of 9.6 in the rest of the State. It is quite certain that the difference would have been even more marked had there not been a laxity in past years in enforcing the vaccination law in private schools located in first and second class cities.

"Other evidence of the efficacy of vaccination is furnished by the vaccination histories which were obtained in 487 out of the 488 cases reported in 1924. *Of these, 451 had never been vaccinated, 33 were vaccinated more than seven years previously, two had been vaccinated six or seven years previously, and one was vaccinated in 1922.* While it is not possible in the State as a whole to obtain figures showing the relative attack rate among unvaccinated persons as compared with those who have been vaccinated, general knowledge as to the large proportion of people who have at some time been vaccinated makes the above findings most significant, especially when the difference between the rates for first and second class cities and for other places is taken into consideration.

"The fact that three individuals contracted the disease despite their having been vaccinated within seven years, again reminds us that there is nothing sacred about the number 'seven' in connection with vaccination. As will be noted, one individual had been vaccinated two years before and yet contracted smallpox. The only safe way is to be revaccinated with potent virus until only an 'immune reaction' results."

The item below is taken from the Weekly Health Review, issued by the Department of Health of the City of Detroit:

"ARE YOU PROTECTED AGAINST SMALLPOX?"

"From December 6 through January 20 there have been 18 cases of smallpox with 6 deaths. Of these cases, all but one are traceable

to an outbreak in one of the schools. One unrecognized case resulted in the spread of the disease, until 17 persons have thus far contracted smallpox, and 6 of them have died.

"There were some 49 known contacts to the 17 cases. Of these, 7 had never been successfully vaccinated and 21 needed revaccination, since their scars were old and did not insure protection. This makes 28 out of 49, or 57.1 per cent, of the contacts who needed vaccination. Only 2 of the 17 cases of smallpox had ever been successfully vaccinated, and they had scars over 30 years old. Both of these cases had been vaccinated within the last 5 years, but the vaccinations did not take. They thought that they were protected. Obviously they were not.

"Coming on top of our comparatively recent smallpox experience this is a most discouraging story. Many people have apparently not yet learned that an *unsuccessful* vaccination does not mean protection. A *successful* scar of recent date is the only sure protection against smallpox.

"How many more people must die from smallpox before the lesson of vaccination and revaccination will be learned and practiced?"

The health officer adds that in Detroit no one has contracted smallpox who had been successfully vaccinated within five years.

DEATHS DURING WEEK ENDED JANUARY 31, 1925

Summary of information received by telegraph from industrial insurance companies for week ended January 31, 1925, and corresponding week of 1924. (From the Weekly Health Index, February 3, 1925, issued by the Bureau of the Census, Department of Commerce)

	Week ended January 31, 1925	Corresponding week, 1924
Policies in force	58, 485, 831	54, 856, 494
Number of death claims	12, 486	11, 168
Death claims per 1,000 policies in force, annual rate	11. 1	10. 6

Deaths from all causes in certain large cities of the United States during the week ended January 31, 1925, infant mortality, annual death rate, and comparison with corresponding week of 1924. (From the Weekly Health Index, February 3, 1925, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Jan. 31, 1925		Annual death rate per 1,000 corresponding week, 1924	Deaths under 1 year		Infant mortality rate, week ended Jan. 31, 1925 [2]
	Total deaths	Death rate [1]		Week ended Jan. 31, 1925	Corresponding week, 1924	
Total (63 cities)	7,425	14.2	[3] 14.3	856	[3] 968	
Akron	33			3	6	33
Albany [4]	31	13.5	17.6	3	3	67
Atlanta	62	13.9	20.6	11	15	
Baltimore [4]	262	17.2	16.7	25	36	73

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births—an annual rate based on deaths under 1 year for the week and estimated births for 1924. Cities left blank are not in the registration area for births.
[3] Data for 62 cities.
[4] Deaths for week ended Friday, Jan. 30, 1925.

Deaths from all causes in certain large cities of the United States during the week ended January 31, 1925, infant mortality, annual death rate, and comparison with corresponding week of 1924. (From the Weekly Health Index, February 3, 1925, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Jan. 31, 1925		Annual death rate per 1,000 corresponding week, 1924	Deaths under 1 year		Infant mortality rate, week ended Jan. 31, 1925
	Total deaths	Death rate		Week ended Jan. 31, 1925	Corresponding week, 1924	
Birmingham	70	17.7	18.7	9	5	
Boston	247	16.4	14.0	39	23	103
Bridgeport	33			2	3	32
Buffalo	131	12.3	16.0	21	33	85
Cambridge	30	13.9	17.2	5	5	86
Camden	37	15.0	19.8	4	12	66
Chicago [1]	756	13.2	12.9	104	116	92
Cincinnati	132	16.8	17.6	11	14	65
Cleveland	191	10.6	11.5	27	33	67
Columbus	89	16.9	15.6	5	7	47
Dallas	50	13.5	11.9	5	8	
Dayton	25	7.5	10.2	2	6	32
Denver	95			10	6	
Des Moines	38	13.3	9.7	2	1	34
Detroit	249			62	59	105
Duluth	19	9.0	13.0	2	4	42
Erie	29			1	5	20
Fall River [1]	43	18.5	17.2	10	9	144
Flint	18			3	8	49
Fort Worth	44	15.1	9.5	8	5	
Grand Rapids	34	11.8	11.2	4	4	62
Houston	58			5	7	
Indianapolis	100	14.5	14.0	11	10	76
Jacksonville, Fla	33	16.4	17.8	3	3	67
Jersey City	81	13.4	14.2	8	14	56
Kansas City, Kans	26	11.0	12.8	3	4	63
Kansas City, Mo	104	14.8	11.7	7	9	
Los Angeles	278			24	22	67
Louisville	80	16.1	20.4	7	6	61
Lowell	32	14.3	14.4	3	6	52
Lynn	37	18.4	16.1	7	3	186
Memphis	123	36.8	26.6	9	12	
Milwaukee	79	8.2	10.3	13	17	59
Minneapolis	107	13.1	11.7	10	17	53
Nashville [1]	49	20.6	20.7	5	9	
New Bedford	29	11.2	13.4	4	7	66
New Haven	57	16.6	10.4	10	5	129
New Orleans	161	20.3	23.2	15	26	
New York	1,568	13.4	13.6	172	178	69
Bronx Borough	194	11.2	10.5	8	23	28
Brooklyn Borough	541	12.6	12.8	64	64	67
Manhattan Borough	643	14.9	15.8	74	72	74
Queens Borough	131	11.9	11.1	20	17	99
Richmond Borough	59	23.0	22.7	6	2	108
Newark, N. J	104	12.0	11.0	16	14	73
Norfolk	31	9.6	13.3	2	4	36
Oakland	43	8.8	15.0	2	10	23
Oklahoma City	23	11.2	6.0	3	1	
Omaha	66	16.3	16.0	6	6	58
Paterson	46	16.9	15.6	8	3	134
Philadelphia	619	16.3	15.0	65	63	82
Pittsburgh	194	16.0	19.3	26	43	91
Portland, Oreg	71	13.1	13.1	7	7	72
Providence	76	16.2	17.5	11	16	88
Richmond	65	18.2	15.3	5	17	61
Rochester	70	11.0		5		40
St. Louis	231	14.7	14.1	17	28	
St. Paul	52	11.0	14.3	5	6	43
Salt Lake City [1]	36	14.3	14.6	4	4	63
San Antonio	57	15.0	18.5	7	12	
San Francisco	154	14.4	15.0	7	15	40
Schenectady	17	8.7	10.9	0	3	0
Seattle	71			3	11	31
Somerville	32	16.3	13.5	4	2	107
Spokane	32			2	1	44
Springfield, Mass	44	15.0	11.9	8	1	119
Syracuse	44	12.0	11.1	6	7	75
Tacoma	27	13.5	14.2	2	5	48
Toledo	83	15.1	12.3	7	9	63
Trenton	37	14.6	12.1	7	6	114
Washington, D. C	153	16.0	16.1	26	22	146
Waterbury	21			4	2	88
Wilmington, Del	27	11.5	12.6	4	3	91
Yonkers	31	14.5	10.5	4	2	88
Youngstown	35	11.4	12.4	8	4	101

[1] Deaths for week ended Friday, Jan. 30, 1925.

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

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Week Ended February 7, 1925

ALABAMA

	Cases
Chicken pox	37
Diphtheria	33
Dysentery	5
Influenza	643
Influenza reported as "Devil's grip"	3
Lethargic encephalitis	1
Malaria	9
Measles	43
Mumps	74
Ophthalmia neonatorum	2
Pellagra	4
Pneumonia	175
Scarlet fever	16
Smallpox	238
Tuberculosis	52
Typhoid fever	2
Whooping cough	3

ARIZONA

Chicken pox	9
Diphtheria	2
Measles	74
Mumps	31
Scarlet fever	11
Smallpox	7
Tuberculosis	2
Typhoid fever	4

ARKANSAS

Cerebrospinal meningitis	1
Chicken pox	55
Diphtheria	14
Influenza	337
Malaria	25
Measles	50
Mumps	26
Pellagra	6
Scarlet fever	37
Smallpox	25
Trachoma	5
Tuberculosis	6
Typhoid fever	13
Whooping cough	7

CALIFORNIA

	Cases
Cerebrospinal meningitis—San Francisco	1
Diphtheria	140
Influenza	65
Leprosy—San Francisco	1
Lethargic encephalitis:	
Sonoma County	1
San Diego	1
San Francisco	1
Measles	37
Poliomyelitis:	
Oakland	1
Tulare	1
Scarlet fever	142
Smallpox:	
Kern County	9
Los Angeles	37
San Diego	37
San Francisco	19
Oakland	12
Scattering	52
Typhoid fever	8

COLORADO

(Exclusive of Denver)

Cerebrospinal meningitis	1
Chicken pox	99
Diphtheria	13
Impetigo contagiosa	1
Influenza	9
Measles	11
Mumps	32
Pneumonia	19
Scarlet fever	46
Smallpox	2
Tuberculosis	40
Typhoid fever	3
Whooping cough	16

CONNECTICUT

Chicken pox	107
Diphtheria	56
German measles	23

CONNECTICUT—continued	Cases
Influenza	6
Lethargic encephalitis	2
Measles	74
Mumps	25
Pneumonia (all forms)	115
Poliomyelitis	1
Scarlet fever	201
Trachoma	1
Trichinosis	1
Tuberculosis (all forms)	30
Typhoid fever	16
Whooping cough	43
DELAWARE	
Diphtheria	3
Measles	1
Mumps	5
Pneumonia	2
Scarlet fever	9
Tuberculosis	29
Whooping cough	4
DISTRICT OF COLUMBIA	
Chicken pox	27
Diphtheria	19
Influenza	3
Measles	7
Pneumonia	37
Scarlet fever	34
Smallpox	4
Tuberculosis	28
Typhoid fever	1
Whooping cough	7
FLORIDA	
Diphtheria	9
Influenza	15
Malaria	7
Pneumonia	2
Scarlet fever	3
Typhoid fever	6
GEORGIA	
Chicken pox	27
Diphtheria	7
Hookworm disease	11
Influenza	183
Malaria	3
Mumps	57
Pneumonia	43
Scarlet fever	11
Smallpox	16
Tuberculosis	26
Typhoid fever	3
Whooping cough	7
ILLINOIS	
Cerebrospinal meningitis—Cook County	1
Diphtheria:	
Cook County	82
Scattering	46
Influenza	33
Lethargic encephalitis:	
Cook County	1
Fayette County	1
Knox County	1
McHenry County	1

ILLINOIS—continued	Cases
Measles	471
Pneumonia	333
Scarlet fever:	
Cook County	340
Kane County	13
Logan County	8
McLean County	12
Madison County	11
Peoria County	15
St. Clair County	8
Sangamon County	8
Schuyler County	20
Will County	11
Scattering	99
Smallpox:	
Alexander County	22
Madison County	29
St. Clair County	19
Scattering	35
Tuberculosis	275
Typhoid fever	13
Whooping cough	279
INDIANA	
Chicken pox	178
Diphtheria	51
Influenza	121
Measles	204
Mumps	15
Pneumonia	44
Scarlet fever:	
Allen County	10
Clark County	22
Elkhart County	17
Lake County	14
Laporte County	10
Marion County	8
Montgomery County	8
Parke County	16
Randolph County	8
St. Joseph County	20
Vigo County	14
Scattering	77
Smallpox:	
Cass County	11
Marion County	8
Tippecanoe County	11
Vigo County	16
Scattering	40
Trachoma	4
Tuberculosis	32
Typhoid fever	2
Whooping cough	28
IOWA	
Diphtheria	21
Scarlet fever	53
Smallpox	24
KANSAS	
Cerebrospinal meningitis	2
Chicken pox	160
Diphtheria	58
German measles	1
Influenza	8
Measles	5
Mumps	424

KANSAS—continued	Cases
Pneumonia	71
Scarlet fever	137
Smallpox	17
Tuberculosis	53
Typhoid fever	1
Whooping cough	55

LOUISIANA	
Diphtheria	31
Influenza	50
Malaria	4
Measles	18
Pneumonia	34
Poliomyelitis	1
Scarlet fever	15
Smallpox	83
Tuberculosis	20
Typhoid fever	16

MAINE	
Chicken pox	84
Diphtheria	4
German measles	3
Influenza	10
Measles	7
Mumps	102
Pneumonia	10
Poliomyelitis	2
Scarlet fever	10
Septic sore throat	3
Tuberculosis	25
Typhoid fever	8
Vincent's angina	1
Whooping cough	2

MARYLAND [1]	
Cerebrospinal meningitis	1
Chicken pox	86
Diphtheria	34
German measles	1
Influenza	113
Lethargic encephalitis	1
Measles	66
Mumps	35
Pneumonia (all forms)	148
Scarlet fever	121
Septic sore throat	6
Tuberculosis	34
Typhoid fever	5
Typhus fever	1
Whooping cough	83

MASSACHUSETTS	
Actinomycosis	1
Cerebrospinal meningitis	2
Chicken pox	239
Conjunctivitis (suppurative)	16
Diphtheria	106
German measles	368
Influenza	62
Lethargic encephalitis	3
Measles	429
Mumps	118
Ophthalmia neonatorum	28
Pneumonia (lobar)	178
Scarlet fever	349

[1] Week ended Friday.

MASSACHUSETTS—continued	Cases
Septic sore throat	6
Trichinosis	3
Tuberculosis (all forms)	142
Typhoid fever	10
Whooping cough	119

MICHIGAN	
Diphtheria	93
Measles	140
Pneumonia	141
Scarlet fever	302
Smallpox	20
Tuberculosis	40
Typhoid fever	8
Whooping cough	116

MINNESOTA	
Chicken pox	159
Diphtheria	67
Influenza	3
Measles	14
Pneumonia	2
Scarlet fever	257
Smallpox	45
Trachoma	1
Tuberculosis	47
Typhoid fever	6
Whooping cough	33

MISSISSIPPI	
Diphtheria	13
Influenza	485
Scarlet fever	10
Smallpox	22
Typhoid fever	7

MISSOURI (Exclusive of Kansas City)	
Cerebrospinal meningitis	1
Chicken pox	83
Diphtheria	81
Influenza	41
Measles	5
Mumps	24
Pneumonia	6
Scarlet fever	197
Smallpox	22
Trachoma	2
Tuberculosis	37
Typhoid fever	3
Whooping cough	21

MONTANA	
Diphtheria	10
Scarlet fever	29
Smallpox	25
Typhoid fever	1

NEW JERSEY	
Anthrax	1
Chicken pox	175
Diphtheria	106
Influenza	20
Measles	127
Pneumonia	175

NEW JERSEY—continued	Cases
Scarlet fever	292
Smallpox	2
Typhoid fever	11
Whooping cough	219

NEW MEXICO

Chicken pox	31
Diphtheria	2
German measles	1
Influenza	18
Measles	9
Mumps	10
Pellagra	1
Pneumonia	12
Scarlet fever	8
Smallpox	1
Tuberculosis	10
Typhoid fever	2
Whooping cough	1

NEW YORK

(Exclusive of New York City)

Cerebrospinal meningitis	4
Diphtheria	105
Influenza	93
Lethargic encephalitis	5
Measles	277
Pneumonia	312
Poliomyelitis	2
Scarlet fever	338
Smallpox	4
Typhoid fever	35
Whooping cough	232

NORTH CAROLINA

Cerebrospinal meningitis	1
Chicken pox	201
Diphtheria	44
German measles	1
Measles	13
Poliomyelitis	1
Scarlet fever	35
Smallpox	72
Typhoid fever	1
Whooping cough	134

OKLAHOMA

(Exclusive of Oklahoma City and Tulsa)

Diphtheria	17
Influenza	433
Pneumonia	180
Smallpox:	
Sequoyah County	8
Scattering	9
Typhoid fever	9

OREGON

Chicken pox	35
Diphtheria:	
Portland	8
Scattering	19
Influenza	5
Lethargic encephalitis	1
Measles	2
Mumps	10
Pneumonia	7

OREGON—continued	Cases
Poliomyelitis	1
Scarlet fever:	
Portland	10
Scattering	25
Smallpox:	
Portland	16
Scattering	10
Tuberculosis	10
Typhoid fever	7
Whooping cough	3

SOUTH DAKOTA

Chicken pox	51
Diphtheria	2
Measles	1
Mumps	1
Pneumonia	5
Scarlet fever	57
Smallpox	8
Tuberculosis	1
Typhoid fever	5
Whooping cough	6

TEXAS

Cerebrospinal meningitis	4
Chicken pox	192
Dengue	13
Diphtheria	87
Dysentery (epidemic)	4
Influenza	4,608
Lethargic encephalitis	3
Measles	171
Mumps	116
Ophthalmia neonatorum	2
Paratyphoid fever	4
Pellagra	30
Pneumonia	390
Poliomyelitis	4
Rabies (human)	5
Scarlet fever	67
Smallpox	132
Tetanus	2
Trachoma	7
Tuberculosis	99
Typhoid fever	22
Whooping cough	151

VERMONT

Chicken pox	63
Diphtheria	4
Measles	3
Mumps	105
Scarlet fever	15
Whooping cough	72

VIRGINIA

Smallpox—Fairfax County	1

WASHINGTON

Chicken pox	151
Diphtheria	53
German measles	65
Lethargic encephalitis	1
Measles	14
Mumps	101
Pneumonia	3
Poliomyelitis:	
Garfield County	1
Whatcom County	1

WASHINGTON—continued	Cases
Scarlet fever	69
Smallpox	59
Tuberculosis	67
Typhoid fever	9
Whooping cough	24
WEST VIRGINIA	
Cerebrospinal meningitis—Morgantown	1
Diphtheria	6
Scarlet fever	6
Smallpox	4
Typhoid fever	13
WISCONSIN	
Milwaukee:	
Chicken pox	40
Diphtheria	17
German measles	223
Measles	268
Mumps	47
Pneumonia	11
Poliomyelitis	1
Scarlet fever	8
Smallpox	4
Whooping cough	22

WISCONSIN—continued	
Scattering:	Cases
Cerebrospinal meningitis	3
Chicken pox	223
Diphtheria	28
German measles	16
Influenza	59
Measles	110
Mumps	122
Pneumonia	21
Scarlet fever	158
Smallpox	43
Trachoma	1
Tuberculosis	29
Typhoid fever	3
Whooping cough	94
WYOMING	
Chicken pox	8
Diphtheria	1
Impetigo contagosia	1
Influenza	1
Mumps	2
Pneumonia	7
Scarlet fever	5

Reports for Week Ended January 31, 1925

DISTRICT OF COLUMBIA	Cases
Chicken pox	37
Diphtheria	21
Influenza	1
Lethargic encephalitis	1
Measles	6
Pneumonia	38
Scarlet fever	29
Smallpox	1
Tuberculosis	31
Typhoid fever	2
Whooping cough	11

NORTH DAKOTA	Cases
Cerebrospinal meningitis	1
Chicken pox	20
Diphtheria	5
German measles	3
Mumps	7
Pneumonia	24
Scarlet fever	75
Smallpox	14
Trachoma	4
Tuberculosis	3
Whooping cough	2

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of monthly State reports is published weekly and covers only those States from which reports are received during the current week:

State	Cerebrospinal meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December, 1924										
Hawaii	------	27	57	------	8	------	------	1	------	12
Minnesota	2	402	10	------	65	------	3	986	554	17
Utah	4	42	113	------	187	------	------	75	5	7
January, 1925										
Massachusetts	11	578	175	------	1,321	------	10	1,684	------	46

PLAGUE-ERADICATIVE MEASURES IN THE UNITED STATES

The following items were taken from the reports of plague-eradicative measures from the cities named for the week ended January 24, 1925:

Los Angeles, Calif.

Week ended January 24, 1925:	
Number of rats examined	3,360
Number of rats found to be plague infected	3
Number of squirrels examined	95
Number of squirrels found to be plague infected	0
Totals to January 24, 1925:	
Number of rats examined	38,173
Number of rats found to be plague infected	78
Number of squirrels examined	1,519
Number of squirrels found to be plague infected	0

Oakland, Calif.

Week ended January 24, 1925:	
Number of rats trapped	2,599
Number of rats found to be plague infected	1
Totals January 1–24, 1925:	
Number of rats trapped	4,277
Number of rats found to be plague infected	13

New Orleans, La.

Week ended January 24, 1925:	
Number of vessels inspected	251
Number of inspections made	878
Number of vessels fumigated with cyanide gas	35
Number of rodents examined for plague	4,370
Number of rodents found to be plague infected	0
Totals to January 24, 1925:	
Number of rodents examined	22,385
Number of rodents found to be plague infected	12

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

Diphtheria.—For the week ended January 24, 1925, 34 States reported 1,631 cases of diphtheria. For the week ended January 26, 1924, the same States reported 2,656 cases of this disease. One hundred and four cities, situated in all parts of the country and having an aggregate population of nearly 28,800,000, reported 902 cases of diphtheria for the week ended January 24, 1925. Last year, for the corresponding week, they reported 1,377 cases. The estimated expectancy for these cities was 1,231 cases of diphtheria. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Measles.—Twenty-nine States reported 2,115 cases of measles for the week ended January 24, 1925, and 14,092 cases of this disease for the week ended January 26, 1924. One hundred and four cities reported 1,173 cases of measles for the week this year, and 5,570 cases last year.

Scarlet fever.—Scarlet fever was reported for the week as follows: 34 States—this year, 4,186 cases, last year, 4,340; 104 cities—this year, 2,041, last year, 1,884; estimated expectancy, 1,071 cases.

Smallpox.—For the week ended January 24, 1925, 34 States reported 1,224 cases of smallpox. Last year, for the corresponding week, they reported 1,096 cases. One hundred and four cities reported smallpox for the week as follows: 1925, 388 cases; 1924, 382 cases; estimated expectancy, 86 cases. These cities reported 27 deaths from smallpox for the week this year, 16 occurring at Minneapolis.

Typhoid fever.—Two hundred and seventy cases of typhoid fever were reported for the week ended January 24, 1925, by 33 States. For the corresponding week of 1924 the same States reported 202 cases. One hundred and four cities reported 94 cases of typhoid fever for the week this year, and 68 cases for the week last year. The estimated expectancy for these cities was 51 cases.

Influenza and pneumonia.—Deaths from influenza and pneumonia (combined) were reported for the week by 104 cities as follows: 1925, 1,256 deaths; 1924, 1,074 deaths.

City reports for week ended January 24, 1925

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence how many cases of the disease under consideration may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding week of the preceding years. When the reports include several epidemics, or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during nonepidemic years. If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1915 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population July 1, 1923, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	73,129	6	2	11	0	0	1	61	5
New Hampshire:									
Concord	22,408	0	0	0	0	0	0	0	1
Nashua	29,234	0	0	0	0	0	12	0	1
Vermont:									
Barre	[1] 10,008	1	0	0	0	0	0	13	0
Burlington	23,613	3	0	1	0	0	1	4	1
Massachusetts:									
Boston	770,400	48	70	19	17	1	135	11	40
Fall River	120,912	3	6	1	0	0	0	0	3
Springfield	144,227	6	4	7	2	1	50	9	2
Worcester	191,927	36	6	12	1	0	2	0	2
Rhode Island:									
Pawtucket	68,799	0	2	0	0	1	0	0	4
Providence	242,378	0	13	0	6	0	3	0	10
Connecticut:									
Bridgeport	[1] 143,555	1	9	6	0	0	0	0	3
Hartford	[1] 138,036	4	8	12	0	0	0	5	6
New Haven	172,967	27	4	1	1	1	9	0	11
MIDDLE ATLANTIC									
New York:									
Buffalo	536,718	26	26	7	2	4	36	15	5
New York	5,927,625	199	229	221	63	24	35	25	254
Rochester	317,867	10	9	1	0	0	9	30	9
Syracuse	184,511	11	9	7	0	0	1	18	6
New Jersey:									
Camden	124,157	8	5	5	1	1	8	0	7
Newark	438,699	41	24	6	6	0	35	10	9
Trenton	127,390	2	7	3	0	0	21	0	7
Pennsylvania:									
Philadelphia	1,922,788	103	76	82	----	9	98	19	99
Pittsburgh	613,442	59	27	13	----	1	126	21	66
Reading	110,917	14	5	1	0	0	1	7	0
Scranton	140,636	1	6	2	0	0	9	0	10

[1] Population Jan. 1, 1920.

City reports for week ended January 24, 1925—Continued

Division, State, and city	Population July 1, 1923, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	406,312	13	12	6	-------	3	1	7	19
Cleveland	888,519	123	35	26	9	3	5	10	20
Columbus	261,082	14	6	0	-------	2	0	2	11
Toledo	268,338	15	7	6	-------	2	13	2	6
Indiana:									
Fort Wayne	93,573	11	4	3	0	0	2	0	1
Indianapolis	342,718	43	17	4	0	1	6	11	8
South Bend	76,709	5	1	3	0	0	4	0	1
Terre Haute	68,939	6	2	1	0	0	0	1	3
Illinois:									
Chicago	2,886,121	130	131	73	8	11	275	20	75
Cicero	55,968	0	2	1	0	0	5	1	1
Peoria	79,675	16	1	1	0	0	0	2	3
Springfield	61,833	5	2	3	1	0	1	27	0
Michigan:									
Detroit	995,668	64	74	34	11	1	3	10	48
Flint	117,968	8	10	1	1	0	0	1	0
Grand Rapids	145,947	7	4	2	0	1	20	0	1
Wisconsin:									
Madison	42,519	19	1	0	0	0	1	107	1
Milwaukee	484,595	59	23	17	2	2	185	63	0
Racine	64,393	38	1	0	0	0	2	8	2
Superior	[1] 39,671	0	1	1	0	0	1	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	106,289	23	3	0	0	0	1	1	1
Minneapolis	409,125	100	22	16	0	1	2	4	9
St. Paul	241,891	36	15	14	0	0	0	17	8
Iowa:									
Davenport	61,262	1	1	2	0	-------	0	0	-------
Des Moines	140,923	3	4	5	0	-------	0	0	-------
Sioux City	79,662	9	2	1	0	-------	0	2	-------
Waterloo	39,667	2	1	0	0	-------	0	-------	-------
Missouri:									
Kansas City	351,819	16	11	3	7	7	4	8	15
St. Joseph	78,232	1	4	1	0	0	0	1	4
St. Louis	803,853	47	54	51	0	0	5	5	-------
North Dakota:									
Fargo	24,841	18	0	0	0	0	0	6	0
Grand Forks	14,547	2	1	2	0	-------	0	0	-------
South Dakota:									
Aberdeen	15,829	6	-------	0	0	-------	0	0	-------
Sioux Falls	29,206	1	1	0	0	0	0	0	0
Nebraska:									
Lincoln	58,761	8	3	3	0	0	1	0	1
Omaha	204,382	20	6	2	0	1	0	0	15
Kansas:									
Topeka	52,555	22	2	2	0	0	1	175	0
Wichita	79,261	25	3	4	0	0	0	0	3
SOUTH ATLANTIC									
Delaware:									
Wilmington	117,728	-------	2	-------	-------	-------	-------	-------	-------
Maryland:									
Baltimore	773,580	44	32	26	60	3	0	25	49
Cumberland	32,361	-------	1	2	0	0	0	-------	2
Frederick	11,301	-------	0	0	0	0	0	-------	1
District of Columbia:									
Washington	[1] 437,571	38	20	11	0	0	13	-------	10
Virginia:									
Lynchburg	30,277	6	1	3	0	0	0	26	3
Norfolk	159,089	20	3	2	0	0	0	99	4
Richmond	181,044	3	6	5	-------	4	3	3	14
Roanoke	55,502	5	2	3	0	1	0	0	2
West Virginia:									
Charleston	45,597	5	2	4	0	0	0	1	1
Huntington	57,918	0	1	1	0	-------	0	0	-------
Wheeling	[1] 56,208	1	2	2	0	0	1	1	4
North Carolina:									
Raleigh	29,171	7	1	0	0	0	0	0	3
Wilmington	35,719	2	0	1	0	1	0	3	3
Winston-Salem	56,230	5	1	1	0	0	0	1	3

[1] Population Jan. 1, 1920.

City reports for week ended January 24, 1925—Continued

Division, State, and city	Population July 1, 1923, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
SOUTH ATLANTIC—con.									
South Carolina:									
Charleston	71,245	0	2	1	0	0	0	0	4
Columbia	39,688	1	1	0	0	0	9	9	1
Greenville	25,789	0	0	0	0	0	1	9	3
Georgia:									
Atlanta	222,963	2	3	1	3	1	0	9	17
Brunswick	15,937	0	0	0	0	0	0	0	0
Savannah	89,448	0	1	2	2	1	0	10	2
Florida:									
St. Petersburg	24,403	0	0	0	0	0	0	9	3
Tampa	56,050	0	1	1	1	0	0	9	0
EAST SOUTH CENTRAL									
Kentucky:									
Covington	57,877	0	2	0	0	0	3	2	4
Louisville	257,671	5	7	5	0	1	2	0	10
Tennessee:									
Memphis	170,067	-------	6	0	-------	3	3	-------	19
Nashville	121,128	0	2	3	-------	3	8	1	3
Alabama:									
Birmingham	195,901	12	3	6	6	3	0	0	18
Mobile	63,858	4	1	0	1	1	0	2	2
Montgomery	45,383	0	1	0	2	0	0	7	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	30,635	5	1	0	0	-------	0	9	-------
Little Rock	70,916	1	1	2	4	0	0	0	10
Louisiana:									
New Orleans	404,575	6	16	14	9	9	0	0	12
Shreveport	54,590	0	-------	0	0	0	1	0	4
Oklahoma:									
Oklahoma	101,150	1	2	3	10	2	1	0	7
Tulsa	102,018	10	2	2	0	-------	0	-------	-------
Texas:									
Dallas	177,274	28	7	8	0	2	1	0	15
Galveston	46,877	0	2	0	13	0	0	0	5
Houston	154,970	0	4	8	0	3	0	0	11
San Antonio	184,727	1	1	3	13	4	1	0	14
MOUNTAIN									
Montana:									
Billings	16,927	16	1	0	0	0	0	1	2
Great Falls	27,787	0	1	1	0	0	20	0	1
Helena	[1] 12,037	-------	0	0	0	0	0	-------	0
Missoula	[1] 12,668	-------	1	0	0	0	0	-------	0
Idaho:									
Boise	22,806	0	0	0	0	0	0	0	0
Colorado:									
Denver	272,031	23	12	22	0	1	4	49	21
Pueblo	43,519	28	4	1	0	0	0	7	4
New Mexico:									
Albuquerque	16,648	3	0	0	0	0	0	0	0
Arizona:									
Phoenix	33,899	4	-------	3	1	0	0	0	3
Utah:									
Salt Lake City	126,241	50	3	1	0	0	2	36	6
Nevada:									
Reno	12,429	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	[1] 315,685	35	5	6	0	-------	2	22	-------
Spokane	104,573	8	3	8	0	-------	0	0	-------
Tacoma	101,731	1	2	8	0	0	0	0	4
Oregon:									
Portland	273,621	21	8	21	0	0	0	5	7
California:									
Los Angeles	666,853	53	45	40	11	1	16	19	33
Sacramento	69,950	0	2	1	0	0	0	0	7
San Francisco	539,038	21	27	14	27	2	1	26	7

[1] Population Jan. 1, 1920.

City reports for week ended January 24, 1925—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
NEW ENGLAND											
Maine:											
Portland	1	1	0	0	0	0	0	1	1	2	27
New Hampshire:											
Concord	1	4	0	0	0	1	0	0	0	0	7
Nashua	2	12	0	0	0	0	0	0	0	2	5
Vermont:											
Barre	1	1	0	0	0	0	0	0	0	1	4
Burlington	1	2	0	0	0	0	0	0	0	4	8
Massachusetts:											
Boston	52	111	0	0	0	17	1	4	0	26	272
Fall River	3	5	0	0	0	1	0	0	0	7	21
Springfield	8	36	0	0	0	1	0	0	0	3	34
Worcester	11	14	0	0	0	2	1	0	0	3	38
Rhode Island:											
Pawtucket	1	0	0	0	0	0	0	0	0	0	20
Providence	8	11	0	0	0	1	1	3	0	2	69
Connecticut:											
Bridgeport	5	21	0	0	0	1	0	0	0	2	33
Hartford	7	9	0	0	0	3	0	0	0	12	41
New Haven	8	27	0	0	0	3	0	0	0	8	55
MIDDLE ATLANTIC											
New York:											
Buffalo	21	24	0	7	0	8	1	3	1	43	118
New York	182	256	0	0	0	[1] 114	11	25	4	100	1,603
Rochester	11	44	0	0	0	1	0	0	0	1	70
Syracuse	16	7	0	0	0	4	0	1	0	0	48
New Jersey:											
Camden	2	10	0	2	3	2	0	0	0	4	44
Newark	22	35	0	0	0	9	1	1	0	69	119
Trenton	3	5	0	0	0	2	0	0	0	13	48
Pennsylvania:											
Philadelphia	56	189	0	2	1	32	4	6	1	70	563
Pittsburgh	24	68	1	0	0	14	1	3	0	8	230
Reading	2	6	0	0	0	6	0	0	0	14	23
Scranton	5	0	0	0	0	0	0	0	0	3	------
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	10	21	1	11	0	5	1	0	0	1	144
Cleveland	35	18	2	0	0	17	2	0	1	21	202
Columbus	7	15	1	10	0	9	0	0	0	2	88
Toledo	17	13	3	3	0	6	0	1	0	27	63
Indiana:											
Fort Wayne	3	8	1	0	0	0	0	0	0	4	22
Indianapolis	9	3	2	17	0	3	1	0	0	1	106
South Bend	3	7	0	1	0	2	0	0	0	0	14
Terre Haute	2	12	0	11	0	0	0	0	0	0	24
Illinois:											
Chicago	99	247	2	0	0	58	3	10	3	164	718
Cicero	1	4	0	0	0	1	0	0	0	3	5
Peoria	6	7	0	0	0	1	0	0	0	6	28
Springfield	2	1	0	0	0	2	0	0	0	1	16
Michigan:											
Detroit	87	100	4	6	3	17	2	3	2	51	253
Flint	9	18	2	1	0	0	0	0	0	4	15
Grand Rapids	9	23	1	0	0	1	0	2	0	11	39
Wisconsin:											
Madison	3	3	1	0	0	0	0	0	0	3	5
Milwaukee	38	13	1	1	0	6	1	0	0	29	96
Racine	6	2	0	7	0	1	0	0	0	2	19
Superior	2	3	3	0	0	0	0	0	0	0	10

[1] Pulmonary tuberculosis only.

City reports for week ended January 24, 1925—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST NORTH CENTRAL											
Minnesota:											
Duluth	6	33	1	1	0	1	0	0	0	1	15
Minneapolis	33	87	9	42	16	5	1	2	0	0	105
St. Paul	21	36	10	7	1	0	0	0	0	22	60
Iowa:											
Davenport	2	1	2	1	----	----	0	0	1	1	----
Des Moines	8	4	3	2	----	----	0	0	----	0	----
Sioux City	3	1	1	0	----	----	0	0	----	0	----
Waterloo	3	1	1	9	----	----	0	0	----	0	----
Missouri:											
Kansas City	14	102	2	3	0	7	0	0	0	4	96
St. Joseph	3	2	1	0	0	1	0	0	0	0	40
St. Louis	29	111	1	8	0	13	1	0	0	2	257
North Dakota:											
Fargo	1	4	0	2	0	0	0	0	0	0	2
Grand Forks	1	0	1	0	----	----	0	0	----	0	----
South Dakota:											
Aberdeen	----	0	----	0	----	----	----	0	----	0	----
Sioux Falls	2	1	1	0	0	0	0	0	0	0	5
Nebraska:											
Lincoln	3	0	0	0	0	0	1	0	0	1	21
Omaha	5	5	2	14	0	4	0	1	0	1	59
Kansas:											
Topeka	2	1	0	1	0	1	0	0	0	1	10
Wichita	2	4	0	0	0	1	1	0	0	4	30
SOUTH ATLANTIC											
Delaware:											
Wilmington	3	----	0	----	----	----	0	----	----	----	----
Maryland:											
Baltimore	36	32	0	0	0	16	2	1	1	62	259
Cumberland	1	0	0	0	0	0	0	0	0	----	12
Frederick	0	0	0	0	0	1	0	0	0	----	2
District of Columbia:											
Washington	20	37	0	2	1	6	1	1	0	7	140
Virginia:											
Lynchburg	0	0	0	0	0	0	0	0	0	1	11
Norfolk	1	1	0	0	0	4	1	0	0	24	----
Richmond	5	4	0	0	0	5	0	0	0	2	67
Roanoke	1	3	0	0	0	2	0	0	0	0	16
West Virginia:											
Charleston	1	4	0	2	0	0	0	0	1	0	18
Huntington	0	1	0	1	----	----	0	0	----	0	----
Wheeling	1	3	0	0	0	0	0	1	1	2	22
North Carolina:											
Raleigh	1	0	0	8	0	0	0	0	0	0	13
Wilmington	1	0	1	0	0	0	0	0	0	1	10
Winston-Salem	2	1	1	3	0	1	0	0	0	1	17
South Carolina:											
Charleston	1	1	0	0	0	3	0	0	0	0	27
Columbia	1	0	0	0	0	1	0	0	0	0	15
Greenville	1	0	0	3	0	1	0	0	0	0	11
Georgia:											
Atlanta	3	2	1	0	0	6	0	0	0	0	85
Brunswick	0	0	0	0	0	0	0	0	0	0	1
Savannah	1	1	1	0	0	1	1	0	0	1	31
Florida:											
St. Petersburg	0	0	1	0	0	1	0	0	0	0	15
Tampa	1	0	0	0	0	2	1	2	0	1	27

City reports for week ended January 24, 1925—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	0	0	0	0	1	0	0	0	2	16
Louisville	5	11	0	5	0	4	0	2	1	3	81
Tennessee:											
Memphis	2	10	1	5	0	5	0	0	0	----	97
Nashville	2	1	0	2	0	0	0	2	0	0	44
Alabama:											
Birmingham	4	10	0	105	0	4	1	0	0	0	62
Mobile	0	0	0	0	0	2	1	0	0	0	35
Montgomery	1	0	0	1	0	0	0	1	0	0	14
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	1	4	1	1	----	----	0	0	----	0	----
Little Rock	2	4	1	0	0	1	0	1	0	0	----
Louisiana:											
New Orleans	3	26	3	0	0	24	2	4	1	2	162
Shreveport	----	0	----	0	0	3	----	0	0	0	27
Oklahoma:											
Oklahoma	2	0	3	0	0	2	0	0	0	2	34
Tulsa	2	4	1	0	----	----	0	0	----	----	----
Texas:											
Dallas	3	7	1	0	0	?	0	2	0	10	63
Galveston	1	0	0	0	0	1	0	2	0	0	18
Houston	2	1	1	6	0	8	0	0	0	0	63
San Antonio	1	0	0	0	0	10	0	0	0	0	69
MOUNTAIN											
Montana:											
Billings	2	12	0	0	0	0	0	0	0	22	5
Great Falls	1	1	2	4	0	0	1	1	0	0	9
Helena	0	0	0	0	0	1	0	0	0	----	6
Missoula	1	0	1	0	0	0	0	0	0	----	2
Idaho:											
Boise	1	5	0	4	0	0	0	0	0	0	3
Colorado:											
Denver	10	9	2	0	0	12	0	0	1	3	100
Pueblo	2	1	0	0	0	2	0	4	0	0	9
New Mexico:											
Albuquerque	1	1	0	0	0	4	0	0	0	0	9
Arizona:											
Phoenix	----	0	----	0	0	13	----	0	0	0	40
Utah:											
Salt Lake City	3	3	3	1	0	0	0	0	0	2	33
Nevada:											
Reno	0	1	0	1	0	0	0	0	0	0	4
PACIFIC											
Washington:											
Seattle	10	12	2	6	----	----	1	1	----	4	----
Spokane	4	2	5	1	----	----	1	0	----	4	----
Tacoma	3	3	2	0	0	1	0	0	0	0	23
Oregon:											
Portland	5	9	4	10	0	6	1	0	0	4	----
California:											
Los Angeles	15	45	2	59	0	25	2	2	1	44	266
Sacramento	1	0	1	2	0	3	1	0	0	0	35
San Francisco	17	14	1	4	2	10	1	2	1	8	158

City reports for week ended January 24, 1925—Continued

Division, State, and city	Cerebro-spinal meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)			Typhus fever	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, est. expectancy	Cases	Deaths	Cases	Deaths
NEW ENGLAND											
Massachusetts:											
Boston	0	0	6	0	0	0	0	2	0	0	0
Worcester	0	0	1	1	0	0	0	0	0	0	0
Rhode Island:											
Providence	0	0	2	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC											
New York:											
New York	4	2	17	9	0	0	1	5	3	0	0
Pennsylvania:											
Philadelphia	0	0	3	1	0	0	0	0	0	0	0
Scranton	0	1	0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	1	1	0	0	0	0	0	0	0	0	0
Cleveland	2	1	2	0	0	0	0	0	0	0	0
Columbus	1	0	0	0	0	0	0	0	0	0	0
Illinois:											
Chicago	0	0	4	2	0	0	0	0	0	0	0
Michigan:											
Detroit	2	0	1	0	0	0	0	1	0	0	0
Wisconsin:											
Milwaukee	0	0	2	1	0	0	0	0	0	0	0
WEST NORTH CENTRAL											
Missouri:											
Kansas City	0	0	0	1	0	0	0	0	0	0	0
St. Louis	1	0	2	0	0	0	0	0	0	0	0
Kansas:											
Topeka	1	0	0	0	0	0	0	0	0	0	0
SOUTH ATLANTIC											
Maryland:											
Baltimore	1	0	2	0	0	0	0	0	0	1	0
Virginia:											
Richmond	0	0	0	0	0	0	0	0	1	0	0
Georgia:											
Atlanta	0	0	0	1	0	0	0	0	0	0	0
Florida:											
St. Petersburg	0	1	0	0	0	0	0	0	0	0	0
EAST SOUTH CENTRAL											
Kentucky:											
Louisville	1	1	0	0	0	0	0	0	0	0	0
Tennessee:											
Nashville	0	0	0	0	0	1	0	0	0	0	0
WEST SOUTH CENTRAL											
Louisiana:											
Shreveport	0	0	0	0	0	1	------	0	0	0	0
Texas:											
Galveston	0	0	0	0	0	1	0	0	0	0	0
Houston	0	0	0	0	0	2	0	0	0	0	0
MOUNTAIN											
Montana:											
Helena	0	1	0	0	0	0	0	0	0	0	0
Arizona:											
Phoenix	0	0	0	1		0	------	0	0	0	0
Utah:											
Salt Lake City	1	3	0	0		0	0	0	0	0	0
Nevada:											
Reno	0	0	0	0		0	0	1	0	0	0
PACIFIC											
California:											
Los Angeles	3	1	1	1		0	1	0	0	0	0
San Francisco	0	0	1	0	0	0	0	1	0	0	0

The following table gives the rates per hundred thousand population for 105 cities for the 10-week period ended January 24, 1925. The population figures used in computing the rates were estimated as of July 1, 1923, as this is the latest date for which estimates are available. The 105 cities reporting cases had an estimated aggregate population of nearly 29,000,000 and the 97 cities reporting deaths had more than 28,000,000 population. The number of cities included in each group and the aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, November 16, 1924, to January 24, 1925—Annual rates per 100,000 population [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Nov. 22	Nov. 29	Dec. 6	Dec. 13	Dec. 20	Dec. 27	Jan. 3	Jan. 10	Jan. 17	Jan. 24
Total	201	175	[2] 190	[3] 193	[4] 197	150	[4] 155	169	[5] 172	[5] 163
New England	209	166	258	[3] 208	221	189	258	256	179	171
Middle Atlantic	159	144	170	175	187	149	140	181	188	175
East North Central	168	173	165	167	185	134	151	132	141	130
West North Central	332	307	309	265	299	168	176	143	255	199
South Atlantic	262	260	[6] 173	201	150	134	146	173	[5] 106	[5] 138
East South Central	183	120	[7] 98	97	149	51	91	120	91	80
West South Central	209	125	144	269	195	116	148	144	195	162
Mountain	258	162	172	315	248	209	191	239	153	239
Pacific	281	128	252	273	[4] 207	226	[4] 129	194	206	223

MEASLES CASE RATES

Total	72	66	[2] 112	[3] 128	[4] 143	105	[4] 158	215	[5] 141	[5] 213
New England	122	147	164	[3] 282	194	278	380	395	440	497
Middle Atlantic	78	79	105	120	115	235	121	169	157	187
East North Central	97	85	199	207	317	138	294	417	127	379
West North Central	29	10	25	35	19	10	10	19	12	27
South Atlantic	22	14	[6] 22	39	24	35	53	83	[5] 43	[5] 38
East South Central	11	0	[7] 0	6	11	0	17	29	46	74
West South Central	5	9	0	0	19	14	9	5	23	14
Mountain	38	29	19	48	57	19	115	134	267	248
Pacific	99	52	136	125	[4] 37	70	[4] 83	194	160	55

SCARLET FEVER CASE RATES

Total	223	232	[2] 270	[3] 312	[4] 314	244	[4] 297	369	[5] 355	[5] 370
New England	385	437	544	[3] 602	552	512	609	661	561	596
Middle Atlantic	185	197	197	260	268	225	286	324	294	326
East North Central	225	228	257	234	311	230	243	383	375	369
West North Central	473	508	616	626	601	468	527	757	755	804
South Atlantic	146	128	[6] 171	252	213	132	203	160	[5] 243	[5] 189
East South Central	97	57	[7] 162	109	240	126	172	229	183	183
West South Central	65	93	125	162	185	65	83	148	116	195
Mountain	229	143	296	162	239	191	162	382	534	305
Pacific	174	168	197	218	[4] 134	133	[4] 138	189	183	220

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1923.
[2] Norfolk, Va., and Memphis, Tenn., not included in calculating the rate. Reports not received at time of going to press.
[3] Worcester, Mass., not included.
[4] Los Angeles, Calif., not included.
[5] Wilmington, Del., not included.
[6] Norfolk, Va., not included.
[7] Memphis, Tenn., not included.

Summary of weekly reports from cities, November 16, 1924, to January 24, 1925—Annual rates per 100,000 population—Continued

SMALLPOX CASE RATES

	Week ended—									
	Nov. 22	Nov. 29	Dec. 6	Dec. 13	Dec. 20	Dec. 27	Jan. 3	Jan. 10	Jan. 17	Jan. 24
Total	34	38	[2] 58	[3] 43	[4] 42	41	[4] 40	57	[5] 58	[5] 70
New England	0	0	0	[3] 0	0	0	0	0	0	0
Middle Atlantic	3	5	5	1	2	2	3	3	10	6
East North Central	10	14	10	13	14	20	27	40	39	48
West North Central	176	236	417	255	209	205	129	220	193	180
South Atlantic	12	6	[6] 48	39	22	28	39	30	[5] 64	[5] 38
East South Central	120	74	[7] 204	177	314	183	372	395	217	675
West South Central	28	32	19	14	51	19	32	65	32	32
Mountain	19	10	19	19	29	48	48	29	57	95
Pacific	142	136	113	113	[4] 106	122	[4] 69	148	212	209

TYPHOID FEVER CASE RATES

Total	24	29	[2] 45	[3] 43	[4] 56	35	[4] 37	36	[5] 21	[5] 17
New England	12	22	30	[3] 16	30	17	25	15	25	20
Middle Atlantic	23	46	71	68	101	57	58	49	21	20
East North Central	11	7	22	32	33	24	28	23	23	11
West North Central	17	4	8	17	15	19	4	6	10	6
South Atlantic	28	30	[6] 56	35	30	37	41	55	[5] 21	[5] 11
East South Central	80	109	[7] 63	57	51	34	40	51	17	29
West South Central	60	37	60	51	56	28	37	70	70	42
Mountain	19	19	10	19	10	0	0	10	0	48
Pacific	46	17	29	17	[4] 14	15	[4] 5	26	6	15

INFLUENZA DEATH RATES

Total	8	10	[2] 12	[3] 17	[4] 16	15	19	21	[5] 22	[5] 22
New England	5	5	17	[3] 5	15	15	3	17	27	10
Middle Atlantic	9	8	11	22	17	14	21	20	18	20
East North Central	5	11	9	13	9	16	10	16	15	18
West North Central	0	7	4	4	9	7	9	13	2	20
South Atlantic	12	14	[6] 11	22	22	14	26	35	[5] 47	[5] 23
East South Central	11	29	[7] 28	23	23	51	63	46	46	63
West South Central	15	25	31	36	41	15	51	41	87	92
Mountain	38	19	29	29	48	10	38	19	29	10
Pacific	0	8	8	4	[4] 17	12	12	20	12	12

PNEUMONIA DEATH RATES

Total	120	130	[2] 153	[3] 159	[4] 172	157	203	192	[5] 215	[5] 211
New England	94	144	127	[3] 109	134	114	174	122	157	216
Middle Atlantic	152	152	188	201	191	178	226	228	260	234
East North Central	90	93	115	125	146	126	165	152	152	142
West North Central	79	74	63	88	68	92	101	90	107	120
South Atlantic	116	169	[6] 191	175	248	205	250	246	[5] 294	[5] 275
East South Central	206	246	[7] 211	217	297	206	303	292	189	320
West South Central	102	107	163	178	163	229	341	260	449	362
Mountain	143	124	210	200	276	219	229	229	248	324
Pacific	86	94	168	135	[4] 86	147	188	184	163	208

[2] Norfolk, Va., and Memphis, Tenn., not included in calculating the rate. Reports not received at time of going to press.
[3] Worcester, Mass., not included.
[4] Los Angeles, Calif., not included.
[5] Wilmington, Del., not included.
[6] Norfolk, Va., not included.
[7] Memphis, Tenn., not included.

Number of cities included in summary of weekly reports and aggregate population of cities in each group, estimated as of July 1, 1923

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases	Aggregate population of cities reporting deaths
Total	105	97	28, 898, 350	28, 140, 934
New England	12	12	2, 098, 746	2, 098, 746
Middle Atlantic	10	10	10, 304, 114	10, 304, 114
East North Central	17	17	7, 032, 535	7, 032, 535
West North Central	14	11	2, 515, 330	2, 381, 454
South Atlantic	22	22	2, 566, 901	2, 566, 901
East South Central	7	7	911, 885	911, 885
West South Central	8	6	1, 124, 564	1, 023, 013
Mountain	9	9	546, 445	546, 445
Pacific	6	3	1, 797, 830	1, 275, 841

FOREIGN AND INSULAR

AZORES

Plague—St. Michael Island.—During the period December 14, 1924, to January 3, 1925, 12 cases of plague with 5 deaths were reported on the island of St. Michael, Azores. The occurrence of most of the cases was at five localities situated from 3 to 9 miles from Ponta Delgada.

EGYPT

Plague, 1924.—From December 25 to 31, 1924, five cases of plague were reported in Egypt. During the year 1924, 373 cases of plague and 194 deaths were reported in Egypt. The number of cases for the year 1923 was 1,519. The hospital reports for the year 1924 show the types of the disease as follows: Bubonic, 249 cases, 71 deaths; pneumonic, 5 cases, 5 deaths; septicemic, 33 cases, 31 deaths.

PANAMA CANAL

Communicable diseases—December, 1924.—During the month of December, 1924, communicable diseases were notified in the Canal Zone and at Colon and Panama as follows:

Disease	Canal Zone	Colon	Panama	Nonresident	Total
Chicken pox	2	1	14	2	19
Diphtheria			1		1
Dysentery	1		2		3
Hookworm disease	1	2	34	34	71
Leprosy			1	1	2
Malaria	40	4	3	52	99
Measles	2	1	6	2	11
Mumps	1			1	2
Pneumonia		4	23	10	37
Tuberculosis	2	8	14	11	35
Typhoid fever				1	1
Whooping cough	5	1	1		7

CHOLERA, PLAGUE, SMALLPOX, AND TYPHUS FEVER

The reports contained in the following tables must not be considered as complete or final as regards either the lists of countries included or the figures for the particular countries for which reports are given.

Reports Received During Week Ended February 13, 1925 [1]

CHOLERA

Place	Date	Cases	Deaths	Remarks
Ceylon				June 29–Nov. 1, 1924: Cases, 7; deaths, 6.
India				Nov. 23–Dec. 6, 1924: Cases, 5,609; deaths, 3,433.
Bombay	Nov. 30–Dec. 20	3	3	
Calcutta	Dec. 20–26	5	5	
Madras	Dec. 14–20	7	2	

[1] From medical officers of the Public Health Service, American consuls, and other sources.

CHOLERA, PLAGUE, SMALLPOX, AND TYPHUS FEVER—Continued

Reports Received During Week Ended February 13, 1925—Continued

PLAGUE

Place	Date	Cases	Deaths	Remarks
Azores:				
St. Michael Island	Nov. 2-Dec. 13	18	8	Previously published.
Do	Dec. 14-Jan. 3	12	5	
Ceylon:				
Colombo	Dec. 14-20	2	1	Rodent plague, 2.
China:				
Nanking	Dec. 21-Jan. 3			Present.
Egypt				Dec. 25-31, 1924: Cases, 5. Jan. 1-Dec. 31, 1924: Cases, 373. Corresponding period, 1923: Cases, 1,519, Jan. 1-8, 1925: Cases, 11; deaths, 4.
Do	Jan. 1-1924-Jan. 1, 1925.	377	194	
City—				
Alexandria	do	2	2	First case, Apr. 2; last case, Nov. 26.
Ismailia	do	1	1	July 6-July 6.
Port Said	do	6	4	Apr. 24-Dec. 7.
Suez	do	20	13	Jan. 2-Dec. 20.
Province—				
Assiout	do	44	35	Apr. 1-Aug. 27.
Behera	do	1	1	Aug. 9.
Beni-Sŏuef	do	4	4	June 21-Dec. 25.
Charkieh	do	1	1	Jan. 31.
Dakhalia	do	1	1	Oct. 1.
Do	Jan. 1-8, 1925	1	1	
Fayoum	Jan. 1, 1924-Jan. 1, 1925.	106	33	Feb. 18-July 18.
Gharbia	do	6	2	Apr. 21-Sept. 2.
Ghirga	do	10	3	Jan. 17-May 13.
Kalioubiah	do	14	4	Jan. 6-Dec. 31.
Do	Jan. 1-8, 1925	3		
Kena	Jan. 1, 1924-Jan. 1, 1925.	45	26	Apr. 9-Nov. 15.
Menoufieh	do	58	36	Jan. 2-Jan. 1.
Do	Jan. 1-8, 1925	7	3	
Minia	Jan. 1, 1924-Jan. 1, 1925.	58	28	Feb. 5-Aug. 1.
Gold Coast				Sept. 1924: Cases, 37; deaths, 38.
India				Nov. 23-Dec. 6, 1924: Cases, 5,293; deaths, 4,197.
Bombay	Dec. 7-20	2	1	
Madras Presidency	Dec. 14-20	161	113	

SMALLPOX

Brazil:				
Pernambuco	Dec. 7-20	36	5	
British South Africa:				
Northern Rhodesia	Nov. 25-Dec. 8	12		
Canada:				
British Columbia—				
Victoria	Jan. 18-24	1		
Manitoba—				
Winnipeg	Jan. 25-31	3		
Ontario—				
Hamilton	Jan. 24-30	1		
China:				
Amoy	Dec. 14-Jan. 3			Present.
Antung	Dec. 22-28	4		
France				July-Oct., 1924: Cases, 61.
Germany				June 29-Nov. 8, 1924: Cases, 7.
Gold Coast				July-Sept., 1924: Cases, 82 deaths, 1.
Greece				Jan.-June, 1924: Cases, 170; deaths, 27.
Do				July-Oct., 1924: Cases, 34; deaths, 25.
India				Nov. 23-Dec. 6, 1924: Cases, 2,396; deaths, 550
Bombay	Nov. 30-Dec. 20	11	6	
Calcutta	Dec. 14-20	44	24	
Karachi	Dec. 21-27		1	
Madras	Dec. 14-20	20	10	
Italy				June 29-Nov. 8, 1924: Cases, 57.
Java:				
Batavia	Dec. 20-26	10	1	Province.
Mexico:				
Tampico	Jan. 11-20	2	2	

CHOLERA, PLAGUE, SMALLPOX, AND TYPHUS FEVER—Continued

Reports Received During Week Ended February 13, 1925—Continued

SMALLPOX—Continued.

Place	Date	Cases	Deaths	Remarks
Nigeria				Jan.-June, 1924: Cases, 357; deaths, 87.
Do				July-Sept., 1924: Cases, 6; deaths, 1.
Spain:				
Cadiz	Dec. 1-31		17	
Malaga	Jan. 11-17		5	
Switzerland:				
Lucerne	Dec. 1-31	10		
Syria:				
Aleppo	Jan. 4-10	12	3	
Tunis:				
Tunis	Jan. 8-14	9	12	
Uruguay				Jan.-June, 1924: Cases, 101; deaths, 2.
Do				July, 1924: Cases, 25; deaths, 3.

TYPHUS FEVER

Bulgaria				Jan.-June, 1924: Cases, 191; deaths, 28.
Do				July-Aug. 1924; Cases, 4.
Chosen:				
Seoul	Nov. 1-30	1	1	
Egypt:				
Cairo	Nov. 12-18	1		
France				July-Oct., 1924: Cases, 7.
Greece				May-June, 1924: Cases, 116; deaths, 8.
Do				July-Oct., 1924: Cases, 30; deaths, 4.
Lithuania				Aug.-Oct., 1924: Cases, 15; deaths, 1.
Palestine:				
Ekron	Dec. 23-29	1		Ramleh District.
Jerusalem	do	2		
Poland				Oct. 26-Nov. 1, 1924: Cases, 24; deaths, 2.
Portugal:				
Oporto	Jan. 4-10	1		
Rumania				Jan.-June, 1924: Cases, 2,906; deaths, 328.
Do				July, 1924: Cases, 60; deaths, 10.
Russia:				
Leningrad	June 29-Oct. 25	11		
Tunis				July 1-Nov. 20, 1924: Cases, 39.
Turkey:				
Constantinople	Jan. 2-8	1		
Yugoslavia				Aug. 3-Oct. 18, 1924: Cases, 17; deaths, 2.

Reports Received from December 27, 1924, to February 6, 1925 [1]

CHOLERA

Place	Date	Cases	Deaths	Remarks
Ceylon:				
Colombo	Nov. 16-22	1		
India				Oct. 19-Nov. 22, 1924: Cases, 12, 221; deaths, 7, 317.
Bombay	Nov. 23-29	1	1	
Calcutta	Oct. 26-Dec. 13	49	41	
Madras	Nov. 16-Dec. 13	43	28	
Rangoon	Nov. 9-29	5	2	
Indo-China				Aug. 1-Sept. 30, 1924: Cases, 14; deaths, 10.
Province—				
Anam	Aug. 1-31	1	1	
Cambodia	Aug. 1-Sept. 30	6	5	
Cochin-China	do	7	4	
Saigon	Nov. 30-Dec. 6	1		
Siam:				
Bangkok	Nov. 9-29	4	2	

[1] From medical officers of the Public Health Service, American consuls, and other sources.

CHOLERA, PLAGUE, SMALLPOX, AND TYPHUS FEVER—Continued

Reports Received from December 27, 1924, to February 6, 1925—Continued

PLAGUE

Place	Date	Cases	Deaths	Remarks
Azores:				
Fayal Island—				
Castelo Branco	Nov. 25			Present with several cases.
Feteira	do	1		
St. Michael Island	Nov. 16–Dec. 29	11	1	
Ponta Delgada	Dec. 6–12	9	5	
British East Africa:				
Kenya—				
Uganda	Aug. 1–31	79	62	
Canary Islands:				
Las Palmas				Stated to have been infected with plague Sept. 30, 1924.
Realejo Alto	Dec. 26	3	1	Vicinity of Santa Cruz de Tenerife.
Celebes:				
Macassar	Oct. 29			Epidemic.
Ceylon:				
Colombo	Nov. 9–Dec. 13	7	7	
China:				
Nanking	Nov. 23–Dec. 6			Present.
Ecuador:				
Guayaquil	Nov. 16–Dec. 15	8	3	Rats taken, 17,677; found infected, 33.
Egypt				Jan. 1–Dec. 9, 1924: Cases, 365. Corresponding period, year 1923—cases, 1,462.
City—				
Alexandria	Dec. 3–9	1	1	Bubonic.
Port Said	Dec. 1–9	2	1	
Suez	Dec. 3–9	1	1	
Hawaii:				
Honokaa	Nov. 4	1		At Mill Camp, location of Honokaa Sugar Co. Plague-infected rodent found, Dec. 9, 1924, in vicinity of Honokaa village.
India				Oct. 19–Nov. 22, 1924: Cases, 11,803; deaths, 8,700.
Bombay	Nov. 22–29	1	1	
Karachi	Nov. 30–Dec. 6	2	1	
Madras Presidency	Nov. 23–Dec. 6	182	128	
Rangoon	Oct. 26–Dec. 6	13	13	
Indo-China				Aug. 1–Sept. 30, 1924: Cases, 25; deaths, 20.
Province—				
Anam	Aug. 1–Sept. 30	4	4	
Cambodia	do	18	15	
Cochin-China	do	3	1	
Java:				
East Java—				
Blitar	Nov. 11–22			Province of Kediri; epidemic.
Pare	Nov. 29			Do.
Soerabaya	Nov. 16–22	6	4	
West Java—				
Cheribon District	Oct. 14–Nov. 3		14	
Pekalongan District	do		29	
Tegal	Oct. 14–20		3	
Madagascar:				
Tananarive Province				Oct. 16–Nov. 15, 1924: Cases, 83; deaths, 75.
Tananarive Town	Oct. 16–Nov. 15	6	5	
Other localties	do	77	70	Bubonic, pneumonic, septicemic.
Straits Settlements:				
Singapore	Nov. 9–15	1	1	
Union of South Africa:				
Cape Province—				
De Aar	Nov. 22–29	1		Native.
Dronfield	Dec. 7–13	1		8 miles from Kimberley.
Kimberley	do	1	1	
Maraisburg District	Nov. 22–Dec. 13	4	2	Bubonic, on Goedshoop Farm.
Orange Free State—				
Hoopstad	Dec. 7–13	1		On farm.
Kroonstad	Nov. 22–29	1		Bubonic; mild; from Grandstable Farm, Hoopstad district.
Vredevort	Dec. 7–13	1	1	On farm.
Transvaal:				
Boshof	Dec. 7–13	1	1	On farm.
Wolmaransstad District	Nov. 22–29	1	1	On Farm Wolverspruit, Vaal River. Native.
On vessel:				
S. S. Conde				At Marseille, France, Nov. 6, 1924. Plague rat found. Vessel left for Tamatave, Madagascar, Nov. 12, 1924.

CHOLERA, PLAGUE, SMALLPOX, AND TYPHUS FEVER—Continued

Reports Received from December 27, 1924, to February 6, 1925—Continued

SMALLPOX

Place	Date	Cases	Deaths	Remarks
Bolivia:				
La Paz	Nov. 1-30	12	7	
Brazil:				
Pernambuco	Nov. 9-Dec. 6	37	11	
British South Africa:				
Northern Rhodesia	Oct. 28-Nov. 24	43	2	In natives.
Canada:				
British Columbia—				
Vancouver	Dec. 14-Jan. 3	32		
Do	Jan. 4-17	35		
Manitoba—				
Winnipeg	Dec. 7-Jan. 3	14		
Do	Jan. 4-24	18		
Ontario				Nov. 30-Dec. 27, 1924: Cases, 33.
China:				
Amoy	Nov. 9-Dec. 13			Present.
Antung	Nov. 17-23	1		
Foochow	Nov. 2-Dec. 13			Do.
Hongkong	Nov. 9-Dec. 6	5	1	
Shanghai	Dec. 7-27	1	2	
Czechoslovakia				April-June, 1924: Case, 1, occurring in Province of Moravia.
Ecuador:				
Guayaquil	Nov. 16-Dec. 15	4		
Egypt:				
Alexandria	Nov. 12-Dec. 23	9		
Gibraltar	Dec. 8-14	1		
Great Britain:				
England and Wales	Nov. 23-Jan. 3	472		
Do	Jan. 4-10	91		
India				Oct. 19-Nov. 22, 1924: Cases, 4,026; deaths, 883.
Bombay	Nov. 2-29	8	6	
Calcutta	Oct. 26-Dec. 13	150	82	
Karachi	Nov. 16-Dec. 20	12	1	
Madras	Nov. 16-Dec. 13	49	20	
Rangoon	Oct. 26-Dec. 6	41	12	
Indo-China				Aug. 1-Sept. 30, 1924: Cases, 223; deaths, 76.
Province—				
Anam	Aug. 1-Sept. 30	49	11	
Cambodia	do	40	9	
Cochin-China	do	115	49	
Saigon	Nov. 16-29	3	2	Including 100 sq. km. of surrounding country.
Tonkin	Aug. 1-Sept. 30	19	7	
Iraq:				
Bagdad	Nov. 9-15	1	1	
Jamaica				Nov. 30-Dec. 27, 1924: Cases, 33. Reported as alastrim.
Kingston	Nov. 30-Dec. 27	4		Reported as alastrim.
Java:				
East Java—				
Pasoeroean	Nov. 12-19			Epidemic in two native villages.
Do	Oct. 26-Nov. 1	9	1	
Soerabaya	Oct. 19-Nov. 29	484	159	
West Java—				
Province—				
Batam	Oct. 14-20	2		
Batavia	Oct. 21-Nov. 14	2		
Cheribon	Oct. 14-Nov. 3	14		
Pekalongan	Oct. 14-Nov. 3	20		
Latvia				Oct. 1-Nov. 30, 1924: Cases, 5.
Mexico:				
Durango	Dec. 1-31		5	
Guadalajara	Dec. 23-29		1	
Do	Jan. 6-12		1	
Mexico City	Nov. 23-Dec. 27	5		
Monterey				Jan. 24, 1925: Outbreak.
Salina Cruz	Dec. 1-31	1	1	
Tampico	Dec. 11-31	5	4	
Do	Jan. 1-10	9	3	
Vera Cruz	Dec. 1-Jan. 3		10	
Do	Jan. 5-18		9	
Villa Hermosa	Dec. 28-Jan. 10			Present. Locality, capital, State of Tabasco.
Peru:				
Arequipa	Nov. 24-30		1	
Portugal:				
Lisbon	Dec. 7-20	19		
Oporto	Nov. 30-Dec. 27	3	2	

CHOLERA, PLAGUE, SMALLPOX, AND TYPHUS FEVER—Continued

Reports Received from December 27, 1924, to February 6, 1925—Continued

SMALLPOX—Continued.

Place	Date	Cases	Deaths	Remarks
Russia				Jan. 1-June 30, 1924: Cases, 9,683.
Spain:				
Barcelona	Nov. 27-Dec. 31		5	
Cadiz	Nov. 1-30		34	
Madrid	Year 1924		40	
Malaga	Nov. 23-Jan. 3		97	
Do	Jan. 4-10		21	
Valencia	Nov. 30-Dec. 6	2		
Switzerland:				
Lucerne	Nov. 1-30	9		
Syria:				
Aleppo	Nov. 23-29	1		
Do	Dec. 21-27	12		Jan. 3-25, 1925: 50 cases present.
Tunis:				
Tunis	Nov. 25-Dec. 29	42	35	
Do	Jan. 1-7	14	17	
Turkey:				
Constantinople	Dec. 13-19	5		
Union of South Africa:				
Cape Province	Nov. 9-29			Outbreaks.
Orange Free State	Nov. 2-8			Do.
Transvaal	Nov. 9-15			Do.

TYPHUS FEVER

Algeria:				
Algiers	Nov. 1-Dec. 31	5	1	
Bolivia:				
La Paz	do	2		
Chile:				
Concepcion	Nov. 25-Dec. 1		1	
Iquique	Nov. 30-Dec. 1		2	
Talcahuano	Nov. 16-Dec. 20		5	
Valparaiso	Nov. 25-Dec. 7		4	
Czechoslovakia				Apr.-June, 1924: Cases 3, occurring in Province of Russinia.
Egypt:				
Alexandria	Dec. 3-9	1	1	
Cairo	Oct. 1-Nov. 11	9	7	
Latvia				Oct. 1-Nov. 30, 1924: Cases, 16.
Mexico:				
Durango	Dec. 1-31		1	
Guadalajara	Dec. 23-29		1	
Mexico City	Nov. 9-Jan. 3	80		Including municipalities in Federal district.
Palestine				Nov. 12-Dec. 8, 1924: Cases, 7.
Peru:				
Arequipa	Nov. 24-30		1	
Poland				Sept. 28-Oct. 25, 1924: Cases, 113, deaths, 5.
Rumania:				
Constanza	Dec. 1-10	1		
Russia				Jan. 1-June 30, 1924: Cases, 92,000.
Spain:				
Madrid	Year 1924		3	
Malaga	Dec. 21-27		1	
Turkey:				
Constantinople	Nov. 15-Dec. 19	6	1	
Union of South Africa:				
Cape Province	Nov. 9-29			Outbreaks.
East London	Nov. 16-22	1		
Orange Free State	Nov. 9-Dec. 13			Do.
Transvaal	Nov. 9-15			Do.
Yugoslavia:				
Belgrade	Nov. 24-Dec. 7	4		

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