PUBLIC HEALTH REPORTS

VOL. 40 APRIL 17, 1925 NO. 16

CURRENT WORLD PREVALENCE OF DISEASE

REVIEW OF THE MONTHLY EPIDEMIOLOGICAL REPORT FOR FEBRUARY 15, 1925, ISSUED BY THE HEALTH SECTION OF THE LEAGUE OF NATIONS' SECRETARIAT [1]

Continued freedom from unusual epidemic conditions in all parts of the world is indicated by the data made available in the Monthly Epidemiological Report issued February 15 at Geneva by the Health Section of the League of Nations' Secretariat. For only a few countries does the information include the month of January; the reports from these, however, indicate a decided upward trend in the prevalence of influenza. In the English cities the number of deaths increased more rapidly than during the preceding months; London and Manchester reported the greatest number of deaths. German cities also showed a definite though less rapid rise in the number of deaths from influenza and pneumonia. Press dispatches have indicated that in most of western Europe influenza of a mild type has been prevalent.

In the United States influenza has been prevalent in only a few localities, chiefly in the Southern States. An increase in the number of cases in several States became apparent in January and seems to have passed its maximum by the end of February. The States affected include Georgia, Alabama, Mississippi, Oklahoma, Arkansas, and Texas.[2]

Epidemic hiccough.—An outbreak of epidemic hiccough is reported from Denmark, with 344 cases in December; 66 cases were notified in November, 2 in October, and 1 in September. "Its appearance coincided with a rise in the reports of influenza," states the report, "and was accompanied by a number of cases of lethargic encephalitis, as shown by the data for the city of Copenhagen."

Cases of epidemic hiccough, lethargic encephalitis, and influenza notified in Copenhagen, Denmark

Four weeks ended—	Epidemic hiccough	Lethargic encephalitis	Influenza
Nov. 22	18	0	437
Dec. 29	127	3	1,155
Jan. 31	18	5	774

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

The age and sex distribution of the cases of epidemic hiccough was as follows: Children under 15 years, 8 cases; males aged 15 to 64 years, 132 cases; males over 65, 11 cases; females, 12 cases.

An outbreak of epidemic hiccough is noted also in Switzerland, where 47 cases were reported during January.

Lethargic encephalitis.—A slight increase in the number of cases of lethargic encephalitis is noted in the December reports of several European countries and in the January reports of Belgium and England and Wales. In England and Wales, where for the three preceding four-week periods the reported number of cases had been from 172 to 174, the number rose to 194 for the four weeks ended January 31.

The number of cases of lethargic encephalitis notified in the United States has been on the increase for several months, as shown below:

Cases of lethargic encephalitis notified in 27 States of the United States, October to January, 1923–24 and 1924–25

Four weeks ended—	1923-24	1924-25
Nov. 1	41	42
Nov. 29	38	54
Dec. 27	26	81
Jan. 24	48	107

Plague.—Reports on plague received at Geneva for December indicate a distinct increase in cases in India, especially in the Punjab and the Upper Ganges Valley, but the prevalence in the south of India, notably in Hyderabad, has diminished.

Deaths from plague in certain provinces of India

Four-week period—	Total	Punjab	United Provinces	Central Provinces	Madras Presidency	Hyderabad State	Bombay Presidency
1924							
Oct. 26–Nov. 22	7,557	901	483	775	260	3,222	830
Nov. 23–Dec. 20	8,420	1,704	1,425	747	499	2,243	701
1925							
Nov. 25–Dec. 22	*9,983*	*1,281*	*1,582*	*996*	*787*	*666*	*1,917*

In Java, plague is more prevalent than it was during the preceding two years; 986 deaths were reported in the two weeks ended November 24. Cheribon and Samarang are the only ports infected; nearly all cases occurred in the central provinces.

Other Asiatic localities reporting a few plague cases included Siam, Indo-China, Singapore, Ceylon, and Bagdad.

Plague reports from the various endemic areas of Africa show that the disease is most prevalent in Madagascar, particularly Tananarive

Province. Of 165 cases reported from Madagascar for December, 120 were in the Province of Tananarive.

Cases of plague continued to be reported from the Union of South Africa—21 in January as compared with 16 in December and 24 in November. Several districts free from plague last year were said to be infected at the time of the reports.

A fresh outbreak at Coumassie in the Gold Coast, where plague incidence had declined considerably during October and November, resulted in 14 cases and 12 deaths from December 3 to 18, 1924.

Ports in the Mediterranean area have been particularly free from plague. Although 12 cases were notified in Egypt from January 1 to 22, all were in the interior provinces. No cases occurred in Suez from December 20 to January 22, and none in Port Said or Alexandria since the first week in December. No cases have been reported from Greece for November or December. At Constantinople, 5 cases of pneumonic plague, all in one family, occurred between December 29 and January 11. No other Mediterranean port reported a case of plague in the period between the issuance of the January and February Epidemiological Reports.

The Public Health Reports for March 6 reported an outbreak of plague in Shansi Province, China. In October, 1924, 790 deaths were reported, mostly from bubonic plague, though a few cases of the pneumonic type were said to have been observed.

In the same month (October) 3 cases were reported as occurring at Turga, a village on the Chita railway, halfway between Borzia and Chita in Transbaikalia.

Cholera.—The cholera incidence in India rapidly declined in December in the provinces of the Upper and Middle Ganges Valley, but a sharp increase occurred in Bengal and Madras Presidency, so that the total for the latest four weeks available, November 23 to December 20, 1924, shows a slight increase over the previous four-week period.

Very few cases of cholera were reported from Ceylon, Indo-China, and Siam.

Typhus fever.—Typhus fever is less prevalent than during last winter in the countries of east and east-central Europe, but some cases were reported in December in Lithuania, Esthonia, Czechoslovakia, Greece, and Leningrad (report for Russia not yet available). Poland has had a more marked seasonal increase in cases, but the number is much less than in 1923.

An outbreak of typhus among natives in Natal, Union of South Africa, caused 233 cases in November; nevertheless, the incidence is lower than in the preceding two years. In Basutoland also the incidence is lower than for the preceding two years. In northern Africa, Algeria, and Tunis have had fewer cases of typhus than a year ago.

Smallpox.—"Less than 50 cases of smallpox were notified in December from the whole European Continent, excluding Russia, Spain, and Portugal, for which countries data were not available," states the Report. On the other hand, further increases occurred in the prevalence of smallpox in England, where 416 cases were reported in the four weeks ended January 24 as compared with 285 cases during the preceding four weeks. The disease continues to be of an exceedingly mild type, and no deaths have been reported in the cities.

The incidence of smallpox has been about 50 per 10-day period in Algeria and 45 in Tunis from November, when it began increasing, up to January 20. The cases in Nigeria rose from 4 in October to 77 in November. Other countries in Africa have reported few cases.

Smallpox continued to increase in the United States, where, in 27 States, 3,103 cases were notified in the four weeks ended December 27, as compared with 2,101 cases during the preceding four weeks, and 2,459 cases during the corresponding period of 1923.

Smallpox is prevalent also in Canada and Mexico, but no cases are reported from the West Indies.

In Java, where a rather severe outbreak occurred late last summer, reaching its maximum in September, the number of cases steadily declined in October and November.

Smallpox in Java and Madura, September 2 to November 24, 1924

Four-week period ended—	Number of cases	Number of deaths
Sept. 29	1028	236
Oct. 27	770	177
Nov. 24	596	119

Enteric fever.—"The seasonal maximum incidence of this group of diseases has now been passed throughout Europe," says the Report "and it is evident, from the complete records now available, that cases were more prevalent in 1924 than in 1923, except in Denmark Holland, and Switzerland, and than in 1922, except in Poland, Lithuania, and Russia."

Dysentery.—The Report points out a somewhat unusual seasonal curve for dysentery in several European countries, i e., a second maximum occurred in October several weeks after the decline from the high summer incidence had begun. This was very marked in Poland, Hungary, and Rumania, and clearly defined also in Czechoslovakia, the Kingdom of the Serbs, Croats, and Slovenes, Bulgaria, and Italy.

Scarlet fever.—Scarlet fever has not been unusually prevalent during the winter. In the Netherlands and Germany the incidence

has been higher than in the previous year, but January reports show a decline in both countries. The fall and winter increases in the disease seem to have reached a maximum in November or December in many countries.

Diphtheria.—Although diphtheria has been more prevalent in recent months than during the preceding winter in most European countries, no unusually severe epidemics have occurred.

In the United States, on the other hand, the incidence of diphtheria has steadily diminished since 1921, and the maximum for the present season seems to have been reached early last autumn.

Measles.—The incidence of measles has been low quite generally during the latter half of 1924. Serious outbreaks had occurred in many countries in the beginning of the year 1924 and in 1923. In the United States, whereas from 50,000 to 60,000 cases were reported monthly in 27 States in the first part of 1924, the same States reported only 4,530 cases in December, 1924.

Severe epidemics have been reported in some parts of Russia. In Leningrad, 657 deaths from measles occurred in the first 11 months of 1924.

Tuberculosis.—A summary of mortality from tuberculosis by months in 1923 and 1924 is given in the Report for the German cities, and for London, Vienna, Budapest, Prague, Paris, and Madrid.

A very marked and rapid decline in the number of deaths from tuberculosis (all forms) in the 46 German cities is indicated. An upward trend in the disease, with wide seasonal fluctuations, was shown for 1921 and 1922; the maximum occurred in the four weeks from February 24 to March 22, when 2,918 deaths were reported. Since then the decline has been very rapid, the increase in the winter of 1923–24 was relatively slight, and the low level of 1,336 deaths was reached in the period September 7 to October 4. Since that time there has been a very slight seasonal increase.

STUDIES ON THE INDUSTRIAL DUST PROBLEM

II. A REVIEW OF THE METHODS USED FOR SAMPLING AERIAL DUST

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

In view of the injurious effects produced by the inhalation of certain dusts, as reviewed by the writer in an earlier paper (1), and of the quantitative relation between dust inhalation and disease, it seems evident that a knowledge of the dust content of the atmosphere is a matter of considerable importance. Such evidence is needed, first of all, in order to estimate the extent of the hazard involved in various industrial processes, and, second, in order to measure the efficiency of various protective devices which may be introduced for the mitigation of the dust hazard.

THE IMPORTANCE OF ANALYTICAL KNOWLEDGE CONCERNING THE SIZE OF DUST PARTICLES PRESENT IN THE ATMOSPHERE

In a series of very valuable and interesting communications the South African workers have shown that practically all of the dust particles in the lungs examined by them are under 10 microns in longest dimension. McCrae (2) digested silicotic lung tissue and examined the residue microscopically. Regarding the size distribution of particles, he says:

> The great majority of particles were found to be of indefinite shape and to have a diameter less than 1 μ (that is, a diameter less than one-eighth of that of a red blood corpuscle); the amount of material with diameter less than 1 μ was very approximately 70 per cent of the whole. No attempt was made to measure diameters less than 1 μ. Many measurements were made of the particles constituting the remaining 30 per cent of the material; the longest diameters of these particles varied between 1 μ and 8.5 μ. In an extensive survey of several microscope preparations, only a negligibly small number of particles was seen whose longest diameter exceeded 8.5 μ, and the very longest observed was 10.5 μ.
>
> The examination of silica particles isolated from this lung tissue (case No. 5) and the examination of silica particles *in situ* in lung tissue from several cases agree in leading to the conclusion that the largest particles which gain access to, and become embedded in, the lung proper have a maximum diameter of about 10 μ (= about 1/2,500 inch); but few having a larger diameter (and these up to only 12 μ) have been found in the lung.

Dr. Watkins-Pitchford (3) examined the silica particles in stained sections from seven silicotic lungs. He obtained results which correspond in the main with those of McCrae. He found the size distribution of 100 such particles to be as follows:

Size	Number
1–4 microns	14
4–6 microns	39
6–8 microns	29
8–10 microns	12
10–13 microns	6

Moir (4) examined 120 particles obtained from two specimens of lung, measured them by means of a micrometer, and found the following:

	microns
15 particles less than	¼
16 particles about	½
12 particles about	¾
30 particles about	1
15 particles about	1¼
13 particles about	2⅔
11 particles about	2¼
3 particles about	2¾
3 particles about	3½
1 particle about	4
1 particle about	5½

As a result of this series of studies it is agreed by most of the workers in this field that in so far as hard rock dust is concerned particles over

10 microns in longest dimension are of negligible importance, and this same reasoning is assumed by many to apply to all types of dust.

Deciding on the lower size limit of the potentially dangerous particles is a matter of much greater difficulty, and one in which no such clear-cut results are possible. Obviously the size of the smallest visible particle will depend on the magnification used, the refractive properties of the dust, and in some degree on the visual acuity of the observer. The point in which we are interested as public health workers is the differentiation in dust content between the ordinary normal atmosphere and the air of dusty factory workrooms such as we know (from statistical studies) to be dangerous to health. This difference is sharply marked so far as the dust particles between approximately ½ and 10 microns in diameter are concerned; but the difference between such normal and abnormal air is masked and lost when we include in our determination the particles of ultramicroscopic size which are present in vast numbers in all air. These very minute particles can be estimated by such optical devices as the koniscope and the dust counter introduced by Aitken. Macfadyen and Lunt (5), for example, by the use of the Aitken dust counter, report 9,000,000 dust particles per cubic foot in ordinary indoor air. Such results as this tend only to mask the really significant differences which distinguish the normal atmosphere from the air of dusty industrial establishments.

If these conclusions are correct, the desideratum is a method which will reveal the number of dust particles of a diameter between 10 microns and ½ micron. A knowledge of the weight of dust present is valuable but much less important than a knowledge of the number of dust particles, since one very large particle is probably less injurious than a large number of smaller ones having the same weight.

REQUIREMENTS OF THE IDEAL DUST SAMPLING INSTRUMENT

It is to be understood that our interest in this problem is in its industrial aspects; and the discussion which follows has been drawn up from this view point only. It is essential that the ideal instrument be capable of efficiently sampling the dusty atmosphere with particular reference to particles of a size from ½ micron to 10 microns, and it should be possible, once this sample is obtained, to make counts of the number of such small particles present; for, from the hygienic standpoint, the count is the best index of the extent of the atmospheric pollution. It is also of much value to have knowledge of the weight of the dust; but because of the fact that it is practically impossible to separate the particles less than 10 microns in size from those over 10 microns in size, and thus obtain the weight of the injurious particles (those capable of gaining access to the

lung tissue), and also because one large particle may weigh many hundreds of times more than a smaller one, the weight of a given sample of dust must be used only as an additional guide in the interpretation of results, and then with some degree of caution.

The range in dust concentration over which one may be called upon to make determinations is very great. Some atmospheres, such as those prevailing outdoors after rainstorms, contain very small quantities of dust, whereas the air of mines or abrasive factories is often very highly polluted. For this reason our instrument must be capable of sampling both high and low dust concentrations with equal efficiency. This imposes a very exacting requirement, for it means that the dust collecting medium (whether it be water, sugar, or an adhesive) shall not add greatly to the dust of the sampled air. In a word, the "control" or "blank" of the instrument must be low; and, furthermore, it must be uniform in dust content. In other words, a sample of the collecting medium must be so uniform that the analysis of a representative sample gives a true picture of the dust content of all of it used in a given series of tests.

Because of the fact that the dust concentration of air is ever varying, it is necessary, in order to obtain a true picture of the condition, that the instrument be capable of sampling large quantities of air. Only in this manner is a picture of average conditions directly secured. It is preferable of course, once the sample is obtained, that the analysis be as simple and rapid as possible. Obviously the more time consuming and the more complex the method of analysis, the less value it possesses. In most of the mines of the United States there is no source of electric power, and this imposes, on any instrument to be used for mine-dust sampling, the requirement that it be capable of being hand driven. And, too, the instrument must be light in weight and portable, and must be of such size that its introduction into a workroom in the vicinity of the workers will not interfere with their movements.

The final choice of an instrument for sampling dust depends, then, on its efficiency, on its small errors in analysis, on its portability and weight, and on the difficulty or ease with which the samples once obtained may be analyzed.

METHODS OF DUST SAMPLING

In general, it is possible to group the methods of dust sampling in classes according to the physical principle utilized by the sampling instrument. That this can not be an exact classification is obvious, as some instruments involve the use of more than one physical principle. The following are the chief methods used for sampling aerial dust: Condensation, filtration, washing, sedimentation, im-

pinging, electrostatic, resistance. A brief description of each of the instruments used in these methods follows.

CONDENSATION METHODS

In 1875, Coulier (6) showed that the dust in air could be rendered visible by reducing the pressure within the containing vessel, causing the moisture present in the air of the vessel to condense on the dust particles. He further showed that this might be prevented by filtration of the air through a layer of cotton wool. This principle has since been utilized by various investigators.

The Aiken koniscope, described by John Aiken in 1889 (7, 8), consists of a metal tube and a suction pump placed at right angles and joined by means of a connecting post. The metal tube is provided with a window at each end and a stopcock at the end distal to the point at which the pump is attached. The tube is lined with hygroscopic material.

In operation, the tube is held horizontally and the pump vertically, the observer looking though the window in the tube at the point where it and the pump meet. Air is drawn into the apparatus by means of the pump and then the stopcock is closed. The air which is now more or less saturated with moisture from the hygroscopic material in the tube is rarified by depressing the pump once again. This results in a lowering of the dew point, with the formation of a fog or cloud that is due to the condensation of the moisture on the dust present. The density of the cloud or fog is then compared with suitable standards and a qualitative estimate of the air dustiness is thus established.

The Aiken dust counter.—An improvement on the koniscope was devised by Aiken and described by him in Nature (9). Essentially it makes use of the same principle as the koniscope, but in this case an attempt is made to derive a count of the number of particles present in the air. The instrument in its earlier form was very large and by no means portable. It consisted of a receiver, an air pump, an air-measuring device, an illuminometer, and a gasometer. The air is drawn into the receiver by means of the gasometer. In passing into the receiver it is measured and mixed with a known quantity of dust-free air and saturated with water. The air is then rarified by means of the pump. The rain, which is produced by the condensation of water on the dust present, falls on the ruled polished silver plate constituting the bottom of the receiver. The number of droplets on the counting plate multiplied by the proper factors for the amount of air sampled and the dilution with dust-free air give a count of the number of particles present in the original sample. This apparatus obviously presents the disadvantage of being very large and not portable. In addition, manipulation is rather intricate and liable to large experimental and personal error.

A modified form of Aiken dust counter was devised in an attempt to overcome some of the drawbacks of the previously described form. In this modified form (10) the receiver consists of a hollow box with a ruled glass bottom and a plain glass top, and is supported on two cylinders which open into it. One of these cylinders forms an air pump and contains the piston; the other cylinder is provided with three taps (stopcocks), the bores of which are of known volume. In the cylinder below these three taps is placed a plug of cotton wool, the lower end of the cylinder being perforated so that air may enter. A mirror is supported beneath the receiver and above it is placed a magnifying lens. Inside the receiver, strips of damp blotting paper serve the purpose of saturating the air with moisture. By drawing down the piston when the stopcocks communicate with the cotton-wool chamber, filtered air is drawn into the receiver. One of the taps (depending on the dustiness of the air to be sampled) is then turned at right angles, and so communicates with the outside air; it is then turned back again and the piston drawn down, thus bringing the sample of dusty air properly diluted with dust-free air into the receiver where the dust is precipitated along with moisture in the form of droplets on the ruled glass plate. These drops on the ruled glass plate are then counted. The multiplication of the count by such appropriate factors as the volume of air sampled gives a final figure for the number of particles of dust present in the original sample. This instrument is portable, being arranged on a tripod for field use.

The disadvantages of this instrument are the same as those enumerated above for the other instruments of this group. The amount of air sampled is very small and the opportunities for personal and experimental error are many. The most serious drawback, however, is that all particles of dust receive equal significance irrespective of size, since this method takes account of particles of an ultramicroscopic size. This is clearly borne out by the results obtained by Aiken. He found, for instance, that the number of particles per cubic inch in country air varied from 8,000 to 100,000, whereas in towns it varied from 1,000,000 to 50,000,000. The following counts obtained by Doctor Cohen (10) with this instrument bring out this point clearly and confirm the findings of Aiken.

	Number of particles per cubic inch
Place where air sample was taken—	
Woodhouse Moor, northwest wind	530,000
Tennis Court, Yorkshire College	852,000
Town Hall Square, Leeds	1,228,000
Paris churchyard, Leeds	3,638,000
Glasgow Town, northwest wind (Aiken)	3,736,000
Flour mill, Leeds	3,113,000

It will be noted that according to the above table the air of the Leeds flour mill contains less dust than the outdoor air of the Paris churchyard. This is without doubt fallacious and due probably to coalescence and aggregation of many of the dust particles in the case of the flour-mill dust.

The Hill diffractoscope described by Hill, in 1917 (11), is essentially the same as the Aiken koniscope. The results are only qualitative, giving a rough estimate of the dust present by the observation of the intensity of a beam of light when it is directed into the window of the rarified air chamber (Tyndall effect).

A late adaptation of the principle of condensation is utilized in the device of Owens (12, 13, 14). The sequence of operations in using this device has been summarized by the author (14) as follows:

> A high velocity jet of air is caused to strike a microscope cover glass; the effect of this high velocity is to bring about a fall of pressure in the jet, accompanying which, and resulting from it, is a corresponding fall of temperature. This in turn causes a condensation of the moisture in the air upon the dust particles, which are thus projected wet against the cover glass, and, as the water evaporates, are left behind adhering to the glass.

In this apparatus the air is moistened by being passed through a chamber lined with moist blotting paper and then is drawn at high velocity through a slot about 1 centimeter in length and 0.1 millimeter in width. After passing through this slot the air suffers a loss of heat and the moisture present condenses on the dust particles which are left on the microscope cover slip forming the top of the cells. The cover slip is then placed under the microscope and the particles are counted.

In summarizing the value of the instuments designed to utilize the principles of condensation of moisture on dust particles we may say that, judged from the point of view of the industrial hygienist, those instruments which permit us only to arrive at a qualitative estimate of the quantity of dust present have little practical value. The instruments of this type which permit of the derivation of a count of particles give results of limited significance, due to errors in sampling and analysis, and also due to the fact that they lead to counts which it is practically impossible to interpret, because particles of ultramicroscopic size which do not, so far as is known, constitute a health hazard, are grouped with those of a significant size from the hygienic point of view. Dr. Owen's apparatus yields high counts in normal indoor air. In very dusty atmosphere, however, the ribbon of dust on the microscope cover slip is so dense that counting the particles, even with high magnification, is difficult and often impossible. Dr. Owens has clearly demonstrated the utility and value of this apparatus for the outdoor conditions for which it was designed.

FILTRATION METHODS

The principle of filtration has been applied to the problem of dust sampling in more variable forms than any other. It seems necessary merely to mention many of these methods, for they present, for the most part, but small variations from each other. In general, the air is filtered through cotton wool, cloth, paper, or a soluble chemical compound, and the analysis made either by comparison with qualitative standards, by weighing, by counting the dust particles, and, lastly, in some cases by both weighing and counting the dust.

Earlier in this paper it was pointed out that Coulier (6) had shown that when air is filtered through a layer of cotton wool it loses its property of producing a Tyndall effect. This experiment indicated that the cotton wool removed the dust from the air, and it would appear, therefore, that such a filter might possess a high efficiency in dust removal.

This method has been used by a number of investigators, Arens (15), Cohen (16), Harcourt (17), Duckering (18), Cohen and Ruston (19), and Ditman (20). It yields only the weight of the dust in the air and, while it is a very valuable method for the estimation of toxic dusts (e. g., lead or arsenic), it is of limited value from the point of view of the production of pneumoconiosis. That these are certain additional drawbacks to this method may be realized from a consideration of one of the most intensive studies of it. Such a study is that of Duckering, previously referred to (18), and may be described as follows:

The important part of the apparatus, that is, the dust-filtering device, consists of a glass weighing bottle provided with inlet and outlet tubes; the inlet tube terminates in an inverted thistle funnel which is filled with cotton wool, the constriction in the lower part of the funnel holding the cotton wool in place. In order to prevent the loss of the cotton wool to any extent, the thistle funnel is covered with a piece of silk which is fastened in place by means of thread tied about the funnel. Duckering made use of three of these bottles in series, aspirating the dust-laden air through them by means of a suitable pump and measuring the quantity of air passed by means of a meter. The method gave results which differed by 0.5 to 0.9 grams, from a weighed control quantity of dust supplied from a Woulff bottle. It was, however, found necessary to resort to a very careful and highly elaborate method of drying the sampling bottles both before and after sampling the atmosphere. This was done by placing the bottles in an oven and drawing dry, dust-free air through them. Concerning this the author says:

> It was found necessary to insure absolutely that there was no leakage in the apparatus when drying, the admission of even a small amount of undried and unfiltered air causing variable results.

The methods of drying necessary for use with this instrument, and the fact that the author was able only to secure results which checked by 0.5 and 0.9 grams, respectively, are vital objections to its use.

The methods of the second group involving the principle of filtration utilize cloth in place of cotton wool. Stacy used cheese cloth squares, which were weighed before the dust was sampled and again after sampling, the difference being considered the weight of the dust caught. Hill (21) used weighed cloth filter bags, which were placed in a conical metal holder and connected to an anemometer for measuring the volume of air sampled. The difference in weight before and after sampling was considered to represent the amount of dust in the quantity of air filtered. Hill found that this method was cumbersome, inaccurate, and required too much time for the making of a single determination. An apparatus similar in principle to that of the above-described bag method is the type known as the American automatic dust filter (22). Here the air is filtered through a series of four or more specially woven cloth bags contained in a closed cabinet. The difference in the weight of bags before and after passage of the air gives the weight of the dust in the volume of air passed through the instrument. The deficiencies of this instrument are similar to those of the Hill bag method previously described. The Carrier dry filter apparatus (23) attempts to keep the filter bags dry during the sampling period by heating the air by means of an electric heating unit before it passes into the filtration bags. The introduction of heating units in the air circuit prior to the filtering medium must greatly increase the possibility of experimental error due to the fact that some dust is caught and retained by the drying units. Because of the high temperature involved, Dunn (24) used bags made of asbestos for filtering the dust from flue gas.

Todd (25) utilized disks of Canton flannel, which were held in a special device, the air being filtered through the cloth and the dust being retained thereon. After the completion of sampling, the disk was compared with a series of standard disks ranging by degrees from 1 to 10 of a rather arbitrary scale.

In connection with all of the above-described methods one must bear in mind the possibility of a large experimental error being introduced in the procedure of bringing to constant dry weight a relatively large filtering cloth. In many cases in which the total quantity of dust is not great, this error must seriously invalidate any results obtained. The use of this method in cases where only qualitative results are obtained is open to several objections. The results of analyses by two different methods can not be correlated, for they are highly arbitrary and, secondly, analysis with any one instrument yields results which can not be interpreted in terms of possible health

hazard. It is, however, possible with some of the above-described methods roughly to graduate or classify various atmospheres in groups based on the amount of dust present; but even here serious error from the hygienic point of view is involved, for an atmosphere of many small particles (capable of gaining access to the lung tissue) and, hence, of an injurious size, may give a lower scale reading than an atmosphere containing a smaller number of large particles which are of relatively lesser hygienic significance.

The Gooch crucible has been used with some degree of success in the sampling of atmospheric dust. This apparatus usually consists of an ordinary porcelain or a platinum Gooch crucible, in the bottom of which a mat of shredded, acid-treated asbestos is made. The crucible is carefully dried and weighed, placed in a suitable holding device, and a known quantity of air is drawn through it; then it is again dried and weighed. The difference in weight is taken to represent the weight of the dust in the quantity of air sampled. The filtration surface of a Gooch crucible is rather small and, with a mat of a thickness sufficient to retain the greater portion of the dust, the resistance to air flow is very high. These factors, taken together, make it possible to sample only a small quantity of air by means of the Gooch crucible.

In order to overcome the objections to the use of cloth filters and the Gooch crucible, several investigators have had recourse to the use of filter paper for sampling dust.

One of the earliest methods used for the determination of dust by a filtration process was that of Rubner. According to Kershaw, the device Rubner employed consisted of a holder in which was placed a piece of filter paper, the holder being connected by suitable tubing to a water jet pump. The volume of air drawn through the paper was measured by means of a gas meter in series with the pump and paper holder. The estimation of the dust was made by comparison of the filter paper with a standard scale. Renk employed for this comparison a mixture of a known amount of soot and oil, which, when used in a glass vessel of wedge-shaped design, gave a color scale of gradually increasing density.

In the Sargent dust determinator (26) a piece of filter paper is fastened between the flanges of a cylindrical aluminum box and its conical-shaped cover. An electric lamp in the bottom of the box serves to keep the filter paper dry. Air is drawn through the instrument and a measuring device in series. The difference in weight before and after filtration of the air is taken to represent the weight of the dust in the amount of air sampled.

Filter paper has been used by a number of other investigators, Moller (27), Hubendick (28), Johannsen (29), and Nesbitt (30). This method is now being used in Great Britain in studies conducted

by the Advisory Committee on Atmospheric Pollution (31, 32). In this case an automatic apparatus has been built by means of which three or four samples are taken each hour.

Paper thimbles.—Filter-paper thimbles have been used successfully in a number of dust investigations (33, 34, 35, 36, 37). The apparatus consists of a filter-paper thimble (similar to a Soxhlet thimble) and its holding device, a means by which the air is drawn through the thimble, and a meter for measuring the air. The thimble is dried in an oven and weighed before and after filtration, the difference in weight being taken to represent the amount of dust in the air sampled.

That good quality filter paper possesses a high efficiency as a filtering medium there is no doubt. It has been shown by Katz and Smith (38) that the efficiency of various grades of filter paper may range from 63 to 90 per cent when tested optically, using tobacco smoke as the test dust. Because of its small particle size, the use of tobacco smoke constitutes a very severe test of the filtering efficiency of a dust-sampling device, and it is generally accepted that good quality filter paper, shortly after its use has begun and its pores have been clogged to some extent with dust, has a filtering efficiency of 95 to 100 per cent. The chief drawback from the hygienic point of view is that a count of the number of particles can not be obtained by the use of filter paper or filter-paper thimbles. It is necessary also in using this method to exercise the utmost caution in the drying and handling of the filter paper so as to avoid the absorption of moisture, lest large errors be introduced in the weighing.

In an effort to overcome these objections many workers have made use of another type of filtration method. In this case the air is filtered through a soluble chemical compound. After sampling, the substance is dissolved and determination of the dust is made both by weight and count or by comparison with a scale of standards.

By the method of Hahn (described by Kershaw) (39) air is drawn through a filter composed of collodion wool, the quantity of air being measured by piston displacement. After a suitable amount of air has been sampled the collodion is dissolved in ether, and the solution is then compared with a series of standards of an arbitrary nature. Fritzsche, in 1898 (40), used a tube containing nitrocellulose in place of the collodion used by Hahn. The method of determination was, however, very similar in other respects.

The most successful method of this type, one utilizing granulated sugar for the purpose of filtering dust, was first employed by Frankland (41) and later by Soper (42), Baskerville and Winslow (43), Gray (44), Johnston (45), the Miners' Phthisis Prevention Committee of South Africa (46), Higgins, Lanza, Laney, and Rice (47), Boyd (48), Fieldner, Katz, and Longfellow (49). This method makes use

of a sampling tube, in which a weighed amount (100 grams in the later types) of clean granulated sugar is placed. The dusty air is drawn through the tube by means of a pump or other suitable device. After a sufficient quantity of air has been sampled (usually 15 cubic feet) the sugar tube is taken to the laboratory for analysis. The sugar is dissolved in hot water, and count and weight determinations are then made on the dust present.

This method has been studied in some detail by Fieldner and others (49), who found the efficiency of the sugar tube to be approximately 35 per cent when tested optically with tobacco smoke and about 87 per cent when tested gravimetrically with silica dust. These results would indicate a relatively high filtering efficiency. By this method it is possible to obtain both weight and count of the number of dust particles present in a given atmosphere. The method does possess one notable shortcoming, namely, the large and variable quantity of dust present originally in all samples of sugar. This method will be discussed in greater detail in a subsequent paper.

WASHING METHODS

Washing methods have been applied to the sampling of dust with much success. These methods consist, in general, in bubbling the air through water, in this manner wetting the dust and bringing it into suspension. An estimate of the amount of dust present may then be made both by weight and count.

Tissandier, in 1874 (50), used Leibig bulbs filled with distilled water through which the air was bubbled. Tooms similarly used a washing method (described by Penderick) (51). Dreschel wash bottles were used for this purpose by Hill (11). In a later contribution (52) Hill and one of his coworkers point out the fact that this method of air sampling did not catch the finer particles of dust. This was found to be the case even when three such wash bottles were used in series.

In 1914 Osborne (53) used a washing method for the determination of the dust in the exhaust stacks of the Barren Island Garbage Disposal Works. The method consists in filtering a measured amount of air through fine mesh wire cloth and then in washing the air by bubbling it through water. The wash bottles were of special construction and consisted of two perforated, curved baffle plates placed one above the other and sealed in place on the inlet tube of the bottles, the inlet tube terminating in a perforated spherical bulb. The wash bottles were filled with water to a point above the baffles.

The Palmer dust apparatus was devised in 1916 by G. T. Palmer, in charge of investigations for the New York State Commission on Ventilation (54). This apparatus consists of a pear-shaped glass bulb, at the base of which is a water trap so arranged that the air is drawn through the trap (preferably at a rate of 4 or 5 cubic feet per

minute), in this manner breaking the water up into a spray which washes the dust from the air. After a suitable quantity of air has been sampled, depending on its dustiness, the water is drained from the trap and taken to the laboratory for analysis. By this method both a weight and count determination of the dust may be made.

By the method of Meyer (55) a sample of air approximately 100 cubic centimeters is drawn into a thoroughly washed Luer syringe (160 cubic centimeters capacity) containing 20 cubic centimeters of dust-free distilled water. The water is thoroughly agitated so as to wet the dust. One drop of this suspension is placed on a Levy blood-counting cell and a count of the dust particles is made. With this method only a count of the number of particles may be obtained. It would seem reasonable to suppose (owing to the small amount of air sampled, and also to the difficulty of wetting the smaller dust particles by such a method, coupled with the necessary laboratory procedure on such a small quantity of dust) that this method of dust sampling and analysis probably gives results which are, to say the least, somewhat erroneous.

Recently a dust-sampling apparatus was designed by T. A. Read, of the Broken Hill South Limited Mine in South Africa (56). It consists of a cylindrical chamber provided with a circular baffle, fitted at the lower end with an air-inlet tube, and at the upper with an air-outlet tube. A small water tube is so arranged that with the air tube the two constitute an atomizer. When suction is applied to the air-exhaust tube, the water and air are atomized into the chamber and against the baffle. The water and the wetted dust drain down the sides of the baffle and once again are sprayed into the chamber. After a sufficient quantity of air has been sampled, the water is removed from the instrument, the dust sampler is rinsed several times, the washings being added to the original fluid, and the complete sample is then taken to the laboratory for analysis. By this method both the weight of the dust and the number of particles present may be determined. As previously noted, little data on this instrument are available at this time; but the notes which we have been furnished indicate that this instrument is approximately 95 per cent efficient in removing silica dust from a synthetic dusty atmosphere prepared by adding silica dust to air and passing this into the sampler. The efficiency of this apparatus has been tested against silica dust at the United States Bureau of Mines Experiment Station and found to be only 12 per cent.

Drinker (57) has developed a method of washing dusty air with water. His method consists in passing the air through a large number of small orifices (125) submerged in water, allowing the air to bubble through the water and then causing it to pass upward in con-

tact with a spiral baffle which serves to remove the water from the air before it leaves the instrument.

Concerning washing methods it is to be pointed out that the main difficulty lies in the inability to wet very small particles of dust in the brief interval of time requisite to sampling large volumes of air. One obvious advantage of this method over the sugar-tube method lies in the fact that the water used, if properly distilled, contains little or no dust, while the sugar in the sugar-tube method, no matter how carefully prepared, always contains a large and variable quantity of solids.

SEDIMENTATION METHODS

Miquel (58), in 1879, described a method of collecting dust by allowing it to settle on plates. The number of particles were then counted by means of a microscope. Tissandier (59), in 1880, substituted sheets of paper 2 meters square for the glass of Miquel. In this case the paper was supported horizontally and, after a suitable period of time, the dust was collected by means of a small brush and examined under the microscope. He also exposed tiles to the air, and the water which was collected during a rainstorm from these tiles was evaporated and examined for dust.

Irwin (60), in 1902, estimated dust in Manchester air by collecting a volume of snow 100 square inches in area and 1 inch in depth. The snow was melted and filtered, and the residue was dried and weighed. This method was also used by Cohen and Ruston (19).

Leifman (61) utilized two oil-coated disks, one supported horizontally and the other vertically, on a revolving vertical shaft. By means of a vane the vertical disk is kept facing the wind and in this manner collects some dust by impaction while the horizontal disk collects the dust deposited by sedimentation. The dust-laden oil was removed from the plates by means of ether, and, after evaporation, the dust was again suspended in 5 cubic centimeters of oil. This final suspension was compared with a series of standards made by mixing various quantities of soot and oil. It is obvious that this method permits of only a rough quantitative estimate of the dust present in the atmosphere. That considerable error is introduced in the actual determination of the amount of dust present by the use of standards made in the above-described manner seems obvious, for the nature of the dust may differ so widely from that used in the standards that color would play a very large part in the comparison.

Des Voeux and Owens (62) used a settlement method for estimating the soot fall of London in 1912. In this case the dust was allowed to fall on the surface of an enameled iron vessel of 2 square feet in area arranged somewhat like a large funnel. The dust was washed down into a bottle beneath the funnel by the rainstorms.

This method is now in use by the Advisory Committee on Atmospheric Pollution of the meteorological office of Great Britain.

Porcelain evaporating dishes were used by Hill in 1913 (21) for the estimation of dust in city air. One of them was exposed on the fire escape of the city hall for a period of six hours and then compared with a similar clean dish in order to estimate the dust fall in the period under observation. Obviously this method affords only a very crude optical quantitative estimate of the dust which falls on the dish at the particular time under observation under the given atmospheric conditions.

Mitchell (63), in 1914, reported the use of rectangular glass plates 5 by 7 inches coated with vaseline and placed on poles 25 or 30 feet above the street level. Whipple and Whipple (64), in a study of the distribution of atmospheric dust in the neighborhood of Boston, utilized tin pails of 2-quart capacity. These were coated inside and out with resistant varnish and suspended on poles about 20 feet above the street level. Each pail contained 1 liter of distilled water. After two weeks' exposure, the pails were brought to the laboratory, the contents removed, and the weight of the dust was determined. This method is an excellent one for the purpose for which it was devised. It does not, however, sample the air, but only permits of an estimate of the quantity of dust which settles on the surface of the water.

Gravity settling methods in general do not assist us in finding out just how much dust a given sample of air contains. By their use we may only arrive at a figure which represents the amount of dust falling on and adhering to a given surface, either oiled, wetted, or dry, in a given period of time. The results obtained by such methods are obviously greatly dependent on the existing meteorological conditions.

IMPINGING METHODS

Instead of sampling dust by allowing it to settle by gravity out of the air onto a surface, another method impinges a definite sample of air on a prepared surface. This type of apparatus possesses the advantage that a definite known volume of air is sampled, and, in addition, by the velocity of the impact a greater percentage of the dust is caught and may be estimated.

One of the earliest types of this method made use of a series of sirup-covered paddles which were revolved in the atmosphere under study. In this case the surface was, of course, really brought into collision with the particles which adhered to and discolored the paddle blades. Obviously this method yields only very crude results.

In the estimation of smoke from chimneys several instruments of this type have been used. The smoke recorder of Eddy, the kapnograph, and the method of Bonham and Weber (22), are all similar

in that a jet of the dust-laden air is impinged against a continuously moving sheet of paper and the amount of dust is estimated by the color imparted to the moving paper. These methods are, of course, only quantitative.

Wells, of the Hygienic Laboratory, suggested the use of the centrifuge for dust estimation. This method consists in admitting a sample of air to the bowl of a high-speed centrifuge which throws down the dust. This apparatus is highly efficient in removing dust from air, but is heavy and very cumbersome. One additional difficulty connected with its use is that of removing the dust from the centrifuge bowl for analysis.

In 1913 Graham Rogers (65) suggested the use of a method which consists in passing a known amount of air through a vertical tube in which a Petrie dish is held horizontally. The dish is of a size somewhat smaller in diameter than the tube. The bottom of the Petrie dish is ruled in squares and is coated with glycerin. The stream of incoming air strikes on the dish before passing around it and leaves its dust on the glycerinated surface to be counted. As will be brought out in a later portion of this paper, it is necessary, in order to deposit dust by impinging, that a rather high velocity of jet be secured. In the Graham Rogers method the velocity of impingement is far too low for high efficiency in the collection of the dust, and, moreover, because of the fact that the impingement is not absolute—that is, the air passes around the edge of the plate—the efficiency must again be greatly reduced.

In 1916 Kotze brought to the attention of the Miners' Phthisis Prevention Committee (66) an instrument which he called the konimeter. This instrument consists of a chamber, one side of which is a vaseline-coated glass plate. Perpendicular to the slide is an impinging orifice. By means of a cylinder and a spring-actuated piston the air is sucked out of the chamber. The only means of ingress of air is through the impinging orifice, and when the air enters the chamber at high velocity in this manner the dust is deposited in the form of a spot on the vaselined plate. The dust may then be counted under the microscope, using a ruled eyepiece. This method has been employed with a high degree of success (67).

Cave (68) in 1914 used an impingement method employing an adhesive coated plate for catching the dust. Doctor Hill has described two forms of dust sampling devices which make use of the principle of impingement (11). The first of these, the photographic dust counter, consists of a metal frame supporting a metal funnel at one end and at the opposite end a photographic plate holder. An anemometer is placed in the funnel-shaped opening, and a moistened photographic plate is placed in the plate holder at the opposite end. Air is forced through the anemometer against the plate. After

the usual type of photographic development, either the particles on the plate may be counted directly or a print may be made and the particles then enumerated. This method is obviously open to the objections of the other of the low-velocity impingement methods, to which is added the error introduced by the use of the photographic method.

The second instrument of this type devised by Hill consists of a hand-actuated piston moving in an air cylinder, the only inlet to which is a nozzle one-eighth inch in diameter. In front of this nozzle and fixed only a small distance from it is a mircoscope cover slip coated with an adhesive preparation. On drawing out the piston a jet of air is impinged on the prepared slide, which catches the dust. By using six slides in series, Hill found that the first slide caught only 62 per cent of the dust. He assumes, however, that all the dust was caught by the six slides, an assumption which there is every reason to consider fallacious. This instrument is similar in principle to the Kotze konimeter. A comparatively high velocity is necessary in order to secure deposition of dust in such a manner. Concerning the Hill counter the South African workers (66) say:

> It is probable that the rate of working is not more than 80 c. c. of air per second, so that the air velocity in the nozzle is about 10 meters per second, which our experience shows to be insufficient. This is borne out by the comparatively low counts obtained by the inventor, e. g., not more than 1 particle per c. c. of air in a schoolroom, a figure which is probably only 2 per cent of the truth.

Of all the impingement methods of sampling dust the Kotze konimeter appears to be the most efficient and suitable for field use. It is small in size, portable, and in its newest form is capable of taking 29 samples on one slide; it makes use of an impinging air jet, which has been carefully studied as to critical velocity, and for these reasons it appears to possess much value in this field.

In 1922 the writer and G. W. Smith reported (69) the use of the impingement principle in a new instrument for sampling dust in air. By means of this instrument the air is impinged at high velocity on a wetted surface and then bubbled through a layer of water. Distilled water of low and uniform dust content is used as the collecting fluid. The instrument samples fairly large volumes of air, being operated at the rate of 1 cubic foot per minute. This instrument was tested by means of the Tyndall beam against tobacco smoke and found to have an efficiency of 66 per cent, and using silica dust the efficiency was found to be 93 per cent. Tested gravimetrically, using silica dust, it was found to have an efficiency of 96 per cent. This instrument will be the sbuject of further discussion in a later portion of this paper.

ELECTROSTATIC METHODS

The fact that electrically charged bodies in an electric field tend to migrate to one of the electric poles has long been known (70, 71). This principle has more recently been applied commercially to the collection of industrial dusts (72, 73, 74, 75). Bill, in 1919, reported (76) the use of this method for the sampling of dust in air. The essential feature of this instrument is a collecting electrode, consisting of a metal tube, and an ionizing electrode, consisting of a metal wire which is placed inside the collecting electrode. The dust particles are charged by the ionizing electrode and travel over to the collecting electrode where they are deposited. But the collection system is only a small part of the complete apparatus. In addition, according to Bill, the apparatus must include a high tension transformer, a rectifying device for the high potential alternating secondary current, a source of alternating current to excite the transformer, and, lastly, a pump or fan for passing the air to be studied through the electrically charged field.

Drinker, Thomson, and Fitchet (77), in 1923, described a greatly simplified form of electrostatic apparatus which possesses a dust removal efficiency of very nearly 100 per cent. This apparatus has again been simplified and described by Drinker and Thomson.[1] It differs from their former apparatus in that current is supplied by four alkali storage cells, from which both the precipitator and suction-fan motor derive the necessary current. The entire apparatus weighs approximately 13 pounds, and appears to be an instrument with considerable practical application.

RESISTANCE METHODS

The last method which we shall attempt to describe makes use of the fact that the resistance of a filtering medium increases as its pores become filled with dust.

The apparatus known as the Anderson and Armspach dust determinator (78) consists of a holder in which a piece of filter paper or other porous fabric is clamped. Air is drawn through the paper at a constant rate and the difference of pressure between the two sides of the paper is determined by means of a U tube, the arms of which open into the holder, one on each side of the paper. The manometer reading indicates the difference of pressure existing between the two sides of the filter. As the paper clogs, more pressure is required to keep the air passing through at the same rate, and the manometer reading thus increases. This instrument is now being developed for use in testing air-washers by the research laboratory of the American

[1] Drinker, Philip, and Thomson, R. M.: The Determination of Suspensions by Alternating Current Precipitation. Meeting Am. Inst. Min. and Met. Engrs., New York City, February, 1925

Society of Heating and Ventilating Engineers. For this purpose it may be of some value. For hygienic purposes, however, it is at this time, surely of no value. The part played by particles of various sizes and the various quantities of dust encountered constitute factors concerning which this instrument gives us no information. It is highly conceivable, for instance, that a large number of comparatively large particles may give the same reading as a small number of smaller particles. At any rate, the correlation between the actual dust content of the air and the resistance to passage through a filter paper is a matter which would take a very long time and much arduous labor to evolve, if it could be done at all. That this is so is clearly brought out in a later communication from the same group of workers (79).

BIBLIOGRAPHY.

(1) Greenburg, Leonard: Studies on the Industrial Dust Problem. I. Dust Inhalation and its Relation to Industrial Tuberculosis. Pub. Health Rep., Vol. 40, No. 7, pp. 291–309.

(2) McCrae, John: The Ash of Silicotic Lungs. Publication of the South African Inst. of Med. Res. No. 1, March, 1913.

(3) Watkins-Pitchford, W.: The Situation, Outline, and Dimensions of Mineral Particles Visible by Polarized Light in Sections of Silicotic Lungs, mounted in Canada Balsam. General Report of the Miners' Phthisis Prevention Committee, Pretoria, 1916, Appendix 8, pp. 135–138.

(4) Moir, J.: Report on a Specimen of Dust from Silicotic Lung. Ibid. Appendix No. 9, pp. 138–140.

(5) Macfadyen, A., and Lunt, J.: Bacteria and Dust in Air. Tr. British Institute for Preventive Medicine, vol. 1, 1897, p. 142.

(6) Coulier: Sur une nouvelle propriété de l'air. Jour. de Pharm. 1875, 22, pp. 165–254.

(7) Aiken, John: On Improvements in the Apparatus for Counting Dust Particles in the Atmosphere. Proceedings Royal Society of Edinburgh, vol. 16, 1888–1889, pp. 135–172.

(8) Aiken, John: On the Number of Dust Particles in the Atmosphere. Transactions Royal Society of Edinburgh, Vol. 35, 1889, pp. 1–20.

(9) Aiken, John: On the Number of Dust Particles in the Atmosphere of Certain Places in Great Britain and on the Continent, with Remarks on the Relation Between the Amount of Dust and Meteorological Phenomena. Nature, Vol. 41, No. 1061, p. 394.

(10) Cohen, J. B.: The Air of Towns. Smithsonian Misc. Collections, 1896, No. 1073.

(11) Hill, E. V.: Quantitative Determination of Air Dust. The Heating and Ventilating Magazine, Vol. 14, No. 6, June, 1917, pp. 23–33.

(12) Owens, J. S.: Suspended Impurity in the Air. Proceedings Royal Soc. 1922, S. A. 101, p. 18.

(13) Owens, J. S.: Atmospheric Dust. Jour. Soc. Chem. Indust. 1922. 41, 436R.

(14) Owens, J. S.: Jet Dust Counting Apparatus. Jour. of Industrial Hygiene, Vol. 4, No. 12, April 1923, p. 522.

(15) Arens, C.: Quantitative Staubbestimmungen in der Luft nebst Beschreibung eines neuen Staubfangers. Arch. f., Hyg. 1894, 21, 325.

(16) Cohen, J. B.: A method of Estimating the Weight of Solid Matter in the Air. Jour. Soc. Chem. Indust. 1897, 16, 411.

(17) Harcourt, A. V.: Report of the Departmental Committee Appointed to Inquire into the Dangers Attendant on the Use of Lead and the Danger of Injury to Health Arising from Dust and Other Causes in the Manufacture of Earthenware and China, etc. Appendices, 2, 120. London, 1910.

(18) Duckering, G. E.: Ibid. appendix 44, pp. 93–113.

(19) Cohen, J. B., and Ruston, A. G.: Smoke: A Study of Town Air. Edward Arnold, London, 1912, p. 88.

(20) Ditman, N. E.: Quantity of Dust in some Dusty Trades. Jour. of Industrial Safety, March, 1912.

(21) Hill, E. V.: Ventilation Division of the Health Department, Chicago, Ill. Tr. Amer. Soc. of Heating and Ventilating Engineers, Vol. 19, 1913, pp, 412–434.

(22) Knowles, R. R.: Dust Determinations in Air and Gases. Tr. Amer. Soc. of Heating and Ventilating Engineers, Vol. 25, 1919, pp. 101–132.

(23) Preliminary Report of the Committee for Standardizing Methods for Testing Air Washers. Tr. Amer. Soc. of Heating and Ventilating Engineers, Vol. 20, 1914, pp. 425–441.

(24) Dunn, E. M.: Determination of Gases in Smelter Flues and Notes on the Determination of Dust Losses at the Washoe Reduction Works, Anaconda, Montana. Tr. Amer. Inst. Min. Eng. 1913, 46, 648.

(25) Todd, J. V.: A New Method of Determining the Dust in Air and in Fresh Air Schoolrooms. New York Med. Jour., Vol. 99, No. 9, Feb. 28, 1914, pp. 426–429.

(26) Sargent, C. E.: The Testing of Inflammable Gases. Iron Trade Rev. 1907, 40, 78; Jour. Amer. Soc. Mech. Eng. 1906, 28, part 2, 815.

(27) Moller, K.: Quantitative Bestimmung des Staubgehaltes der Luft. Gsndht. Ing. 1894, 17, 373.

(28) Hubendick, E.: Staubbestimmung in Hochofengasen. Abstracted in Ztschr. f. angew. Chem., 1906, 1, 350.

(29) Johannsen, O.: Ueber Staubbestimmungen in Gichtgas. Stahl u. Eisen. 1912, 32, 16.

(30) Nesbitt, C. T.: A Simple Apparatus for Estimating Dust in Gas. Chem. News 1912, 106, 235.

(31) Meteorological Office, Great Britain, Advisory Committee on Atmospheric Pollution. Report on Observations in the Years 1916, 1917. Lancet 1918, 1, Supplement to March 23.

(32) McKay, R. J.: Recent Progress in Smoke Abatement and Fuel Technology in England. Mellon Inst. Indust. Res. Smoke Investigation, Bull. 10. 1922.

(33) Simon, J.: Ein neuer Apparat. zur Bestimmung des Staub und Wassergehalts in Abgasen. Stahl u. Eisen. 1905, 25, 1069.

(34) Brady, W. A., and Touzalin, L. A.: The Determination of Dust in Blast Furnace Gases. Jour. of Ind. and Eng. Chem., Vol. 3, No. 9, September 1911, p. 662.

(35) Mariner and Hoskins: Laboratory Report on Air Analysis. Smoke Abatement and Electrification of Railway Terminals in Chicago. Report of the Chicago Association of Commerce, 1915.

(36) Monnett, O.: Determination of Atmospheric Impurities. Chem. Met. Engin., 1920, 23, 1117, 1173.

(37) Trostel, L. J., and Frevort, N. W.: Collection and Examination of Explosive Dusts in Air. Jour. of Ind. and Eng. Chem., Vol. 15, No. 3, March 1923, pp. 232–236.

(38) Katz, S. H., and Smith, G. W.: Determination of Suspended Matter in Gases by Collection in Filter Papers. U. S. Bureau of Mines. Report of Investigations No. 2378. July 1922.

(39) Kershaw, J. B. C.: Dust, Soot, and Smoke. Cassiers Magazine, Vol. 39, 1911, pp. 250–257.

(40) Fritzsche, P.: Colorimetrische Rauchdichtebestimmung. Ztschr. f. anal. Chem., 1898, 37, 92.

(41) Frankland, L. F.: A New Method for the Quantitative Estimation of the Micro-organisms Present in the Atmosphere. Philosophical Tr. of the Royal Soc. of London. Vol. 178, December 9, 1886. pp. 113–152.

(42) Soper, G. A.: The Air and Ventilation of Subways. John Wiley & Sons, New York, 1908, pp. 244.

(43) Baskerville, C., and Winslow, C-E. A.: The Air of New York City Schools. Report of Committee on School Inquiry, Board of Estimate and Apportionment. New York City. July 1, 1913.

(44) Gray, J.: A New Type of Dust Collecting Tube. Jour. Chem. Met. Min. Soc., S. Africa, 1912–13, 13, 186.

(45) Johnston, A. McA.: Note on Dust Determination by Filtration through Sugar. Jour. Chem. Met. Min. Soc., S. Africa, 1911–1912, 12, 442; 1912–1913, 13, 150.

(46) General Report of the Miners' Phthisis Prevention Committee of South Africa. Pretoria, 1916, p. 20: Appendix p. 66.

(47) Higgins, E., and Lanza, A. J., Laney, F. B., and Rice, G. S.: Siliceous Dust in Relation to Pulmonary Disease among Miners in the Joplin District, Missouri. U. S. Bureau of Mines, Bulletin 132, Washington, D. C., 1917.

(48) Boyd, J.: Sampling of Dust in Mine Air. Engin. and Min. Jour. 1919, 107, 395.

(49) Fieldner, A. C., Katz, S. H., and Longfellow, E. S.: The Sugar Tube Method of Determining Rock Dust in Air. U. S. Bureau of Mines. Technical Paper 278, Washington, D. C., 1921.

(50) Tissandier, G.: Les poussières atmosphériques. Compt. Rend. 1874, 78, 821.

(51) Penderick, S.: Ventilation and Health Conditions in the Mines of the Witwatersrand, with Special References to the Ventilation System of the East Rand Proprietary Mines. Jour. Chem. Met. Min. Soc., S. Africa, 1910–1911, 11, 60.

(52) Hill, E. V., and Armspach, O. W.: Further Studies in Methods of Dust Determination. Trans. Amer. Soc. of Heating and Ventilating Engineers, Vol. 25, 1919, pp. 289–304.

(53) Osborne, L. S.: Report to Committee on Street Cleaning Board of Estimate and Apportionment. New York City, 1914.

(54) Palmer, G. T.: A New Sampling Apparatus for the Determination of Aerial Dust. Amer. Jour. of Pub. Health, Vol. 6, No. 1, Jan. 1916, pp. 54–55.

(55) Meyer, A. L.: A Method for Determining the Finer Dust Particles in Air. Jour. of Indus. Hyg., Vol. 3, No. 2, June 1921, pp. 51–56.

(56) Warren, P. H., and Read, T. A.: Methods and Apparatus for the Determination of Dust Suspended in Air. Unpublished manuscript.

(57) Drinker, Philip K., Thomson, Robert M., and Fitchet, Seth M.: Atmospheric Particulate Matter. 1. Dust, with a New Apparatus for Its Determination. Jour. of Indus. Hyg., Vol. 5, No. 1., pp. 19–35. May 1923. Jour. of Indus. Hyg., Vol. 5, No. 2, pp. 62–78. June 1923.

(58) Miquel, P.: Etude sur les poussières organisées de l'atmosphère. Ann. d'hyg. 1879, S. 3, 2, 226, 333.

(59) Tissandier, G.: Les poussières de l'atmosphère. Rev. Sci. 1880, S. 2, 17, 814.

(60) Irwin, W.: The Soot Deposited on Manchester Snow. Jour. Soc. Chem. Indus. 1902, 21, 533.

(61) Leifman, K.: Habilitationschrift Degree Thema. University of Halle. 1907.

(62) Des Voeuz, H. A., and Owens, J. S.: The Sootfall of London: Its Amount, Quality, and Effects. Lancet 1912, 1, 47.

(63) Mitchell, J. P.: Determination of Dust Fall in the Neighborhood of Cement Plants. Jour. Indus. and Engin. Chem., 1914, 6, 454.

(64) Whipple, G. C., and Whipple, M. C.: Studies in Air Cleanliness. Tr. Amer. Soc. of Heating and Ventilating Engineers. Vol. 21, 1915, pp. 211–224.

(65) Progress Report of the Committee on Standard Methods for the Examination of the Air. Amer. Jour. of Pub. Health, Vol. 3, No. 1, Jan. 1913, pp. 78–86.

(66) Final Report of the Miners' Phthisis Prevention Committee. Pretoria 1919, pp. 110.

(67) Innes, John: The Estimation of Injurious Dust in Mine Air by the Kotze Konimeter. Jour. Chem., Met., and Min. Soc. of South Africa. Vol. 18, No. 9, March, 1919, pp. 199–206.

(68) Cave, O. J. P. et al.: First Report of the Committee for the Investigation of Atmospheric Pollution, April 1914 to March 1915. Reviewed in Analyst. 1916, 41, 113.

(69) Greenburg, L., and Smith, G. W.: A New Instrument for Sampling Aerial Dust. Reports of Investigations, U. S. Bureau of Mines, Serial No. 2392, Sept. 1922.

(70) Hohlfeld, M.: Das Niederschlagen des Rauches durch Electricitat. Kastner Archiv. Naturl., Vol. 21, 1824, pp. 205–206.

(71) Lodge, O.: Historical Note on Dust Electrification and Heat. Nature, 1904–1905, 71, 582.

(72) Cottrell, F. G.: The Electrical Precipitation of Suspended Particles. Jour. Indus. and Eng. Chem., 1911, 3, 542.

(73) Cottrell, F. G.: Problems in Smoke, Fume, and Dust Abatement. Smithsonian Ann. Report 1913, 653.

(74) Cottrell, F. G.: Recent Progress in Electrical Smoke Precipitation. Eng. Min. Jour. 1916, 191, 385.

(75) Bush, H. J.: Electrical Precipitation. Jour. Soc. Chem. Indus., 1922, 41, 21T.

(76) Bill, J. P.: The Electrostatic Method of Dust Collection as Applied to the Sanitary Analysis of Air. Jour. of Indus. Hyg., Vol. 1, No. 7, November 1919, pp. 223–342.

(77) Drinker, Philip, Thomson, Robert M., and Fitchet, Seth M.: Atmospheric Particulate Matter. 11. The Use of Electric Precipitation for Quantitative Determinations and Microscopy. Jour. Indus. Hyg., Vol. 5, No. 5, pp. 162–185, Sept. 1923.

(78) Ingels, M.: New Data on Air Dust Determinations. Jour. of the Amer. Soc. of Heating and Ventilating Engineers, Vol. 29, No. 2, March, 1923, pp. 177–193.

(79) Ingels, M.: The Production and Measurement of Air Dustiness. Jour. Amer. Soc. of Heating and Ventilating Engineers, Vol. 30, No. 2, Feb. 1924, pp. 135–151.

HIGHWAY SIGNS TO SHOW CITY HAS APPROVED WATER SUPPLY

MINNESOTA STATE BOARD OF HEALTH POSTS SIGNS ON HIGHWAYS APPROACHING MUNICIPALITIES HAVING WATER SUPPLIES APPROVED BY STATE BOARD OF HEALTH

The Minnesota State Board of Health is arranging for the posting of signs on public highways entering certain municipalities in the State informing the traveling public, particularly the tourist, that the water supply of the particular town has been approved as safe by the State board of health. The signs will be approximately 18 inches in width by 24 inches in height and will be attached to the standard of and immediately below the highway sign bearing the name of the municipality.

In the case of State trunk highways, the signs will be placed by the State highway department as directed by the State board of health, and arrangements will be made through the county highway engineers for the posting of these signs on other roads. Municipalities which are permitted to post these signs agree to have the water supplies investigated at least once each year and to make any reasonable changes, alterations, improvements, or repairs to the water-supply system which may be necessary from time to time in order to maintain the system in a satisfactory and approved condition, and also agree to advise the State board of health in advance when any changes in the system are contemplated and to notify immediately the State board of health in case of any accident to the system which might impair the sanitary quality of the water. These municipalities further agree to make no objection to the removal of said highway signs in case the water supply is at any time found to be in a condition which would be considered unsatisfactory from a sanitary point of view by the State board of health.

It is felt that the posting of these signs advising the traveling public, particularly the tourist, as to which water supplies are safe for drinking purposes will be information which will be greatly appreciated by many. Incidentally, it is good advertising for the municipality and should encourage other cities and villages whose water supplies are not already safe to make the necessary changes so as to place them on the approved list.

DIGEST OF PUBLIC HEALTH COURT DECISION

State law and board of health regulations held to conflict with Harrison antinarcotic act.—(United States Circuit Court of Appeals, Sixth Circuit; decided July 2, 1924.) Chapter 105 of the Tennessee acts of 1919 provided that a physician might prescribe a 30-day supply, not exceeding 8 grains per day, of morphine to a patient presenting a health officer's certificate showing that the patient was incurably addicted to the use of morphine. The State board of health adopted regulations thereunder providing that a local health officer or a delegated physician might make these certificates of incurability, and that the words "incurably addicted" were construed to mean and apply only to narcotic addicts affected with incurable diseases or infirmity of age. A physician during a period of nine months had given to 108 morphine addicts a total of 4,095 prescriptions calling for 79,592 grains of morphine. Pursuant to the Tennessee law and regulations he required his patients to bring the certificate mentioned. The court affirmed his conviction for violating the Harrison Act, holding the Tennessee law and regulations to be in conflict with the Harrison Act as interpreted in the case of United States *v.* Behrman,[1] 42 Sup Ct. 303. (Simmons *v.* United States, 300 Fed. 321.)

DEATH RATES IN A GROUP OF INSURED PERSONS

COMPARISON OF PRINCIPAL CAUSES OF DEATH, JANUARY AND FEBRUARY, 1925, AND FEBRUARY AND YEAR, 1924

The accompanying table is taken from the Statistical Bulletin for March, 1925, published by the Metropolitan Life Insurance Co., and presents the mortality experience of the industrial insurance department of the company for February, 1925, as compared with January, 1925, and with February and the year, 1924. The rates are based on a strength of approximately 16,000,000 insured persons.

Two especially favorable items are noted in the February mortality record. The first is the continued low mortality from tuberculosis. For this month, which usually shows one of the highest death rates for tuberculosis, the rate was a little more than 1 per cent below the average for the whole year of 1924. The second is the remarkably low rates for the four epidemic diseases of childhood—measles, scarlet fever, whooping cough, and diphtheria. As compared with February, 1924, more favorable rates are also shown for diseases incident to maternity.

On the other hand, the mortality from influenza rose sharply as compared with January, and the death rate from this cause was also 26 per cent higher than in February, 1924. The combined mortality

[1] Public Health Reports, August 11, 1922, p. 1952.

for the degenerative diseases is running a little higher than last year; and for the sixth time in seven successive months the diabetes death rate was higher than for the corresponding month of the preceding year.

Death rates (annual basis) for principal causes per 100,000 lives exposed, January and February, 1925, and February and year, 1924

[Industrial department, Metropolitan Life Insurance Co.]

Cause of death	Death rate per 100,000 lives exposed [1]			
	Feb., 1925	Jan., 1925	Feb., 1924	Year 1924 [2]
Total—all causes	1007.6	952.6	1018.9	907.5
Typhoid fever	2.6	4.4	2.5	4.4
Measles	2.1	2.3	9.6	7.2
Scarlet fever	4.2	5.1	6.6	4.4
Whooping cough	6.9	5.1	8.0	7.4
Diphtheria	11.6	15.8	17.2	13.2
Influenza	32.7	25.1	26.0	16.0
Tuberculosis (all forms)	103.2	96.1	107.9	104.5
Tuberculosis of respiratory system	92.1	84.8	97.2	92.6
Cancer	70.7	70.7	70.4	70.4
Diabetes mellitus	16.7	19.1	15.6	14.9
Cerebral hemorrhage	61.2	58.5	67.9	60.2
Organic diseases of heart	145.3	143.2	137.8	123.7
Pneumonia (all forms)	137.1	125.4	136.6	88.8
Other respiratory diseases	17.8	16.8	18.5	13.9
Diarrhea and enteritis	19.0	17.0	17.6	32.2
Bright's disease (chronic nephritis)	83.0	70.3	75.6	65.5
Puerperal state	18.4	14.4	19.4	16.8
Suicides	7.2	5.7	6.2	7.2
Homicides	6.0	6.6	5.7	7.1
Other external causes (excluding suicides and homicides)	55.3	59.2	54.5	62.7
Traumatism by automobile	8.1	11.0	9.5	15.7
All other causes	207.0	192.0	215.2	187.0

[1] All figures include infants insured under one year of age.
[2] Based on provisional estimate of lives exposed to risk in 1924

DEATHS DURING WEEK ENDED APRIL 4, 1925

Summary of information received by telegraph from industrial insurance companies for week ended April 4, 1925, and corresponding week of 1924. (From the Weekly Health Index, April 7, 1925, issued by the Bureau of the Census, Department of Commerce.)

	Week ended Apr. 4, 1925	Corresponding week, 1924
Policies in force	59, 279, 062	55, 514, 283
Number of death claims	12, 622	11, 136
Death claims per 1,000 policies in force, annual rate	11.1	10.5

Deaths from all causes in certain large cities of the United States during the week ended April 4, 1925, infant mortality, annual death rate, and comparison with corresponding week of 1924. (From the Weekly Health Index, April 7, 1925, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Apr. 4, 1925		Annual death rate per 1,000 corresponding week, 1924	Deaths under 1 year		Infant mortality rate week ended Apr. 4, 1925 [2]
	Total deaths	Death rate [1]		Week ended Apr. 4, 1925	Corresponding week, 1924	
Total (65 cities)	7,737	14.6	[3] 14.7	859	[3] 1,008	
Akron	41			3	11	33
Albany [4]	45	19.6	16.3	8	5	178
Atlanta	63	14.1	23.4	10	13	
Baltimore [4]	266	17.4	14.5	23	29	67
Birmingham	76	19.3	19.7	10	7	
Boston	266	17.7	16.4	31	37	82
Bridgeport	32			5	4	79
Buffalo	148	13.9	15.6	24	24	98
Cambridge	28	13.0	11.6	2	2	34
Camden	27	10.9	14.9	2	9	33
Chicago [4]	806	14.0	13.3	109	120	96
Cincinnati	158	20.1	17.4	13	9	77
Cleveland	205	11.4	10.7	25	27	62
Columbus	91	17.3	15.7	8	11	75
Dallas	54	14.6	7.2	4	10	
Dayton	42	12.7	13.6	1	19	16
Denver	104			8	15	
Des Moines	36	12.6	15.1	1	4	17
Detroit	305			55	52	93
Duluth	23	10.9	11.5	1	4	21
Erie	28			3	3	59
Fall River [4]	50	21.5	13.4	14	5	201
Flint	23			5	9	82
Fort Worth	30	10.3	12.0	3	7	
Grand Rapids	33	11.4	17.9	7	8	109
Houston	47			1	4	
Indianapolis	101	14.7	15.0	14	14	96
Jacksonville, Fla	33	16.4	16.3	1	3	2
Jersey City	86	14.2	12.7	8	13	56
Kansas City, Kans	37	15.6	18.4	3	5	63
Kansas City, Mo	118	16.7	19.1	12	20	
Los Angeles	233			19	28	53
Louisville	94	18.9	17.8	3	12	26
Lowell	32	14.3	16.7	5	9	87
Lynn	22	11.0	14.6	2	6	53
Memphis	81	24.2	24.2	7	8	
Milwaukee	134	13.9	10.8	14	16	64
Minneapolis	139	17.0	12.7	20	7	107
Nashville [4]	61	25.6	18.6	4	5	
New Bedford	39	15.0	7.9	12	6	199
New Haven	58	16.9	16.9	9	12	116
New Orleans	144	18.1	21.9	15	15	
New York	1,508	12.9	13.9	185	196	74
Bronx Borough	178	10.3	10.6	23	16	80
Brooklyn Borough	524	12.2	12.6	61	87	64
Manhattan Borough	638	14.7	16.6	88	76	88
Queens Borough	131	11.9	12.1	12	15	60
Richmond Borough	37	14.4	19.9	1	2	18
Newark, N. J	108	12.4	11.8	10	19	46
Norfolk	43	13.3	10.8	6	6	107
Oakland	61	12.5	12.0	2	5	23
Oklahoma City	21	10.2	10.0	3	1	
Omaha	62	15.3	12.5	3	4	29
Paterson	27	9.9	16.7	4	5	67
Philadelphia	527	13.9	15.9	64	68	80
Pittsburgh	233	19.2	22.6	25	41	88
Portland, Oreg	78	14.4	12.0	7	5	72
Providence	83	17.7	16.3	7	16	56
Richmond	45	12.6	18.7	5	5	61
Rochester	84	13.2		9		71
St. Louis	268	17.0	15.7	15	21	
St. Paul	83	17.6	12.0	6	8	51
Salt Lake City [4]	21	8.4	17.0	2	5	31
San Antonio	59	15.5	16.9	5	7	

[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 63 cities.
[4] Deaths for week ended Friday, Apr. 3, 1925.

Deaths from all causes in certain large cities in the United States during the week ended April 4, 1925, infant mortality, annual death rate, and comparison with corresponding week of 1924. (From the Weekly Health Index, April 7, 1925, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Apr. 4, 1925		Annual death rate per 1,000 corresponding week, 1924	Deaths under 1 year		Infant mortality rate week ended Apr. 4, 1925
	Total deaths	Death rate		Week ended Apr. 4, 1925	Corresponding week, 1924	
San Francisco	179	16.7	17.2	9	18	52
Schenectady	27	13.8	13.5	2	4	56
Seattle	67			2	6	20
Somerville	23	11.7	8.8	2	3	54
Spokane	33			3	3	65
Springfield, Mass	43	14.7	11.9	7	5	104
Syracuse	42	11.4	16.1	4	12	50
Tacoma	28	14.0	11.1	3	2	71
Toledo	73	13.2	15.3	10	12	91
Trenton	45	17.8	16.5	4	7	65
Utica	36	17.5		4		82
Washington, D. C	144	15.1	15.5	8	17	45
Waterbury	16			2	2	44
Wilmington, Del	28	12.0	7.8	2	1	46
Worcester	63	16.5	13.3	14	4	162
Yonkers	38	17.7	10.0	4	3	88
Youngstown	31	10.1	14.1	3	7	38

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 April 11, 1925

ALABAMA	Cases
Cerebrospinal meningitis	1
Chicken pox	34
Dengue	1
Diphtheria	13
Dysentery	7
Influenza	205
Malaria	21
Measles	25
Mumps	83
Ophthalmia neonatorum	1
Pellagra	25
Pneumonia	121
Poliomyelitis	1
Scarlet fever	42
Smallpox	123
Tetanus	1
Tuberculosis	56
Typhoid fever	10
Whooping cough	35

ARIZONA	
Diphtheria	3
Measles	66
Mumps	5
Scarlet fever	6
Trachoma	1
Tuberculosis	6
Whooping cough	4

ARKANSAS	
Chicken pox	16
Diphtheria	5
Hookworm disease	4
Influenza	231
Malaria	38
Measles	33
Mumps	33
Pellagra	20

ARKANSAS—continued	Cases
Scarlet fever	2
Smallpox	4
Trachoma	1
Tuberculosis	15
Typhoid fever	3
Whooping cough	18

CALIFORNIA	
Cerebrospinal meningitis—Los Angeles	1
Diphtheria	101
Influenza	40
Leprosy—Sacramento	1
Lethargic encephalitis:	
Alameda	1
Berkeley	1
Measles	105
Poliomyelitis—Los Angeles	2
Scarlet fever	110
Smallpox:	
Los Angeles	25
Oakland	10
Orange County	9
San Diego	15
Scattering	21
Typhoid fever	6

COLORADO (Exclusive of Denver)	
Chicken pox	18
Diphtheria	14
Influenza	5
Measles	5
Mumps	18
Pneumonia	5
Scarlet fever	21
Tuberculosis	23
Typhoid fever	1
Whooping cough	9

CONNECTICUT	Cases
Chicken pox	39
Diphtheria	27
German measles	41
Influenza	17
Lethargic encephalitis	1
Measles	71
Mumps	13
Paratyphoid fever	2
Pneumonia (all forms)	79
Scarlet fever	130
Tuberculosis (all forms)	35
Typhoid fever	3
Whooping cough	68

DELAWARE	
Measles	3
Mumps	1
Pneumonia	1
Scarlet fever	1
Tuberculosis	8
Whooping cough	2

FLORIDA	
Chicken pox	15
Diphtheria	6
Influenza	53
Malaria	12
Measles	7
Mumps	123
Pneumonia	139
Scarlet fever	6
Smallpox	4
Tetanus	5
Tuberculosis	62
Typhoid fever	13
Whooping cough	29

GEORGIA	
Chicken pox	33
Conjunctivitis (infectious)	2
Diphtheria	11
Dysentery	8
Hookworm disease	3
Influenza	359
Malaria	27
Measles	16
Mumps	102
Pellagra	14
Pneumonia	118
Poliomyelitis	1
Scarlet fever	5
Septic sore throat	14
Smallpox	19
Tetanus	1
Trachoma	1
Tuberculosis	34
Typhoid fever	17
Typhus fever	1
Whooping cough	38

ILLINOIS	
Cerebrospinal meningitis:	
Adams County	1
Cook County	1
Fayette County	1
Diphtheria:	
Cook County	54
Scattering	24

ILLINOIS—continued	Cases
Influenza	50
Lethargic encephalitis—Alexander County	1
Measles	1,160
Pneumonia	334
Poliomyelitis—Lee County	1
Scarlet fever:	
Cook County	280
Lawrence County	8
Schuyler County	11
Scattering	115
Smallpox	17
Tuberculosis	287
Typhoid fever	13
Whooping cough	278

INDIANA	
Cerebrospinal meningitis	1
Chicken pox	50
Diphtheria	23
Influenza	284
Measles	116
Mumps	3
Pneumonia	13
Poliomyelitis	1
Scarlet fever:	
Allen County	17
Cass County	12
Elkhart County	52
Fulton County	10
Huntington County	9
Laporte County	9
Miami County	14
St. Joseph County	28
Vanderburgh County	16
Scattering	95
Smallpox	47
Tuberculosis	66
Typhoid fever	3
Whooping cough	37

IOWA	
Diphtheria	16
Scarlet fever	36
Smallpox	16
Typhoid fever	1

KANSAS	
Cerebrospinal meningitis	2
Chicken pox	55
Diphtheria	22
German measles	2
Influenza	32
Measles	11
Mumps	265
Pneumonia	85
Poliomyelitis	1
Scarlet fever	115
Smallpox	10
Tuberculosis	45
Typhoid fever	4
Whooping cough	13

LOUISIANA	
Diphtheria	10
Hookworm disease	5
Influenza	38
Lethargic encephalitis	2
Malaria	9

LOUISIANA—continued	Cases
Pellagra	10
Pneumonia	41
Scarlet fever	13
Smallpox	20
Tuberculosis	35
Typhoid fever	19
Whooping cough	16

MARYLAND [1]

Cerebrospinal meningitis	1
Chicken pox	96
Diphtheria	15
German measles	3
Influenza	32
Measles	29
Mumps	80
Pneumonia (all forms)	107
Scarlet fever	56
Smallpox	1
Tetanus	1
Tuberculosis	88
Typhoid fever	4
Vincent's angina	1
Whooping cough	107

MASSACHUSETTS

Cerebrospinal meningitis	5
Chicken pox	175
Conjunctivitis (suppurative)	24
Diphtheria	97
German measles	279
Influenza	55
Lethargic encephalitis	2
Measles	810
Mumps	87
Ophthalmia neonatorum	18
Pneumonia (lobar)	159
Poliomyelitis	1
Scarlet fever	283
Septic sore throat	4
Tetanus	1
Trachoma	3
Tuberculosis (all forms)	158
Typhoid fever	8
Whooping cough	170

MICHIGAN

Diphtheria	80
Measles	234
Pneumonia	138
Scarlet fever	378
Smallpox	20
Tuberculosis	107
Typhoid fever	9
Whooping cough	132

MINNESOTA

Cerebrospinal meningitis	1
Chicken pox	60
Diphtheria	58
Influenza	4
Lethargic encephalitis	1
Measles	15
Pneumonia	12
Scarlet fever	186

[1] Week ended Friday.

MINNESOTA—continued	Cases
Smallpox	8
Tuberculosis	90
Typhoid fever	3
Whooping cough	23

MISSISSIPPI

Diphtheria	3
Scarlet fever	1
Smallpox	35
Typhoid fever	6

MONTANA

Cerebrospinal meningitis	1
Chicken pox	11
Diphtheria	17
German measles	70
Influenza	3
Measles	22
Mumps	21
Scarlet fever	31
Smallpox	11
Tuberculosis	8
Typhoid fever	3
Whooping cough	5

NEW JERSEY

Anthrax	1
Chicken pox	107
Diphtheria	78
Influenza	17
Measles	211
Pneumonia	129
Poliomyelitis	2
Scarlet fever	275
Smallpox	2
Trachoma	1
Typhoid fever	3
Whooping cough	255

NEW MEXICO

Chicken pox	8
Diphtheria	3
German measles	1
Influenza	5
Measles	18
Mumps	7
Poliomyelitis	2
Pneumonia	6
Scarlet fever	6
Tuberculosis	7
Typhoid fever	1
Whooping cough	11

NEW YORK

(Exclusive of New York City)

Cerebrospinal meningitis	3
Diphtheria	85
Influenza	136
Measles	582
Pneumonia	450
Scarlet fever	379
Smallpox	6
Typhoid fever	17
Whooping cough	198

NORTH CAROLINA

	Cases
Cerebrospinal meningitis	1
Chicken pox	119
Diphtheria	24
German measles	1
Measles	19
Poliomyelitis	2
Scarlet fever	25
Septic sore throat	6
Smallpox	80
Whooping cough	81

OREGON

Cerebrospinal meningitis	[1] 4
Chicken pox	19
Diphtheria:	
Portland	14
Scattering	10
Influenza	386
Measles	3
Mumps	29
Ophthalmia neonatorum	1
Pneumonia	[1] 13
Scarlet fever:	
Portland	13
Scattering	19
Smallpox	8
Tuberculosis	14
Typhoid fever	4
Whooping cough	7

SOUTH DAKOTA

Chicken pox	8
Diphtheria	2
Lethargic encephalitis	1
Measles	1
Pneumonia	10
Scarlet fever	38
Smallpox	5

TEXAS

Chicken pox	105
Diphtheria	34
Dysentery (epidemic)	3
Influenza	274
Measles	82
Mumps	117
Paratyphoid fever	2
Pellagra	6
Pneumonia	59
Scarlet fever	35
Smallpox	59
Trachoma	2
Tuberculosis	49
Typhoid fever	4
Whooping cough	40

VERMONT

Chicken pox	28
Diphtheria	2
Measles	1
Mumps	61
Scarlet fever	11
Whooping cough	2

VIRGINIA

Poliomyelitis—Westmoreland County	1
Smallpox—Arlington County	3

WASHINGTON

Cerebrospinal meningitis—Everett	1
Chicken pox	124
Diphtheria	18
German measles	22
Measles	33
Mumps	112
Pneumonia	1
Scarlet fever	48
Smallpox	40
Tuberculosis	60
Typhoid fever	4
Whooping cough	103

WEST VIRGINIA

Diphtheria	2
Scarlet fever	16
Smallpox	2
Typhoid fever	1

WISCONSIN

Milwaukee:	
Chicken pox	22
Diphtheria	12
German measles	176
Influenza	2
Measles	205
Mumps	64
Pneumonia	18
Scarlet fever	13
Smallpox	7
Tuberculosis	10
Whooping cough	23
Scattering:	
Cerebrospinal meningitis	1
Chicken pox	118
Diphtheria	31
German measles	117
Influenza	369
Measles	205
Mumps	239
Pneumonia	39
Scarlet fever	133
Smallpox	28
Tuberculosis	16
Typhoid fever	2
Whooping cough	41

WYOMING

Chicken pox	2
Measles	9
Mumps	3
Pneumonia	1
Rocky Mountain spotted fever	2
Scarlet fever	7
Typhoid fever	1

[1] Deaths.

Reports for Week Ended April 4, 1925

DISTRICT OF COLUMBIA

	Cases
Chicken pox	23
Diphtheria	8
Influenza	2
Lethargic encephalitis	1
Measles	42
Pneumonia	38
Poliomyelitis	1
Scarlet fever	26
Smallpox	7
Tuberculosis	31
Typhoid fever	1
Whooping cough	15

GEORGIA

	Cases
Chicken pox	58
Conjunctivitis (infectious)	1
Diphtheria	15
Dysentery	9
Hookworm disease	5
Influenza	929
Malaria	51
Measles	44
Mumps	182
Paratyphoid fever	3
Pellagra	10
Pneumonia	183
Rabies	2
Scarlet fever	13
Septic sore throat	5
Smallpox	7
Tetanus	1
Trachoma	1
Tuberculosis	46
Typhoid fever	12
Whooping cough	91

NEBRASKA

	Cases
Chicken pox	12
Diphtheria	7
Measles	5
Mumps	3
Scarlet fever	11
Smallpox	22
Tuberculosis	1

NORTH DAKOTA

	Cases
Chicken pox	14
Diphtheria	2
Measles	1
Mumps	12
Pneumonia	23
Scarlet fever	33
Smallpox	14
Trachoma	1
Tuberculosis	2
Typhoid fever	1
Whooping cough	27

OKLAHOMA

(Exclusive of Oklahoma City and Tulsa)

	Cases
Cerebrospinal meningitis:	
Comanche County	1
Harper County	1
Leflore County	1
Diphtheria	8
Influenza	358
Pneumonia	97
Scarlet fever:	
Washington County	17
Scattering	11
Smallpox	5
Typhoid fever	4
Whooping cough	21

Report for Week Ended March 21, 1925

NORTH DAKOTA

	Cases
Chicken pox	15
Diphtheria	4
German measles	1
Measles	7
Mumps	12
Pneumonia	16
Scarlet fever	83
Smallpox	9
Tuberculosis	5
Typhoid fever	1
Whooping cough	13

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
March, 1925										
Alabama	9	54	2,767	107	138	45	6	114	672	56
Connecticut	3	206	65	1	632	----	----	637	0	12
Florida	----	39	90	44	30	11	----	16	22	39
Indiana	1	118	821	----	----	----	2	951	----	21
Massachusetts	10	429	374	----	2,747	----	7	1,458	----	42
Nebraska	1	30	77	----	----	----	1	73	----	3
Wisconsin	0	170	311	----	2,601	----	6	600	197	6

Number of Cases of Certain Communicable Diseases Reported for the Month of January, 1925, by State Health Officers

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Alabama	322	153	73	313	125	995	134	55	122
Arizona	41	13	290	96	29	83	112	1	10
Arkansas	170	29	175	147	51	48	[1] 33	37	72
California	1,387	636	185	654	686	695	809	50	620
Colorado	495	99	31	430	205	3	151	12	37
Connecticut	443	246	232	178	814	-------	137	16	306
Delaware	12	24	7	19	18	-------	36	-------	11
District of Columbia	179	76	45	-------	134	11	103	31	53
Florida	36	40	8	118	9	4	32	49	14
Georgia	89	68	26	144	30	14	50	9	21
Idaho	-------	1	-------	-------	54	-------	-------	-------	-------
Illinois	1,877	584	1,575	1,092	2,064	210	907	119	1,191
Indiana	-------	257	-------	-------	927	-------	-------	55	-------
Iowa	87	91	11	44	265	148	[1] 1	[2]	9
Kansas	667	178	24	1,659	530	38	142	4	177
Kentucky [3]	-------	-------	-------	-------	-------	-------	-------	-------	-------
Louisiana	37	80	20	-------	77	265	[1] 123	144	25
Maine	235	51	68	324	120	1	[1] 46	23	107
Maryland	316	150	177	156	411	-------	216	44	310
Massachusetts	1,394	578	1,321	422	1,684	-------	626	46	529
Michigan	1,115	421	707	499	1,310	151	448	54	505
Minnesota	682	264	75	-------	1,220	341	276	11	110
Mississippi	881	138	302	1,997	69	141	322	123	591
Missouri	354	355	30	111	1,242	56	170	17	60
Montana	113	52	31	40	169	97	54	6	115
Nebraska	-------	59	-------	-------	107	-------	-------	12	-------
New Hampshire [4]	-------	-------	-------	-------	-------	-------	-------	-------	-------
New Jersey	963	445	483	-------	1,024	35	422	50	1,037
New Mexico [4]	-------	-------	-------	-------	-------	-------	-------	-------	-------
New York	2,459	1,366	1,023	1,105	2,539	58	1,556	342	1,464
North Carolina	659	205	117	-------	180	311	-------	8	455
North Dakota	131	24	28	61	350	50	14	3	27
Ohio	1,967	503	390	667	2,128	706	599	91	660
Oklahoma	252	107	45	202	221	131	101	137	148
Oregon	203	129	20	90	182	170	64	10	30
Pennsylvania	2,542	961	2,356	2,302	2,690	27	479	95	1,161
Rhode Island	-------	63	-------	-------	115	-------	-------	7	-------
South Carolina	57	100	1	48	8	92	10	10	9
South Dakota	132	37	15	8	241	45	16	15	16
Tennessee	260	84	116	1	95	447	100	44	234
Texas [3]	-------	-------	-------	-------	-------	-------	-------	-------	-------
Utah	662	47	44	198	55	23	[1] 12	1	87
Vermont	210	10	8	285	104	-------	[1] 11	4	79
Virginia	910	176	459	-------	239	27	[1] 395	24	923
Washington	580	180	66	468	218	145	152	28	86
West Virginia	294	132	136	-------	244	282	60	115	252
Wisconsin	1,202	227	1,156	1,092	688	263	155	14	483
Wyoming	82	7	5	5	37	7	2	1	4

[1] Pulmonary.
[2] Reports not required by law.
[3] Reports received weekly.
[4] Reports received annually.

Case Rates per 1,000 Population (Annual Basis) for the Month of January, 1925

State	Chicken pox	Diphtheria	Measles	Mumps	Scarlet fever	Smallpox	Tuberculosis	Typhoid fever	Whooping cough
Alabama	1.54	0.73	0.35	1.49	0.60	4.75	0.64	0.26	0.58
Arizona	1.18	.38	8.37	2.77	.84	2.40	3.23	.03	.29
Arkansas	1.08	.18	1.11	.93	.32	.30	[1] 1.21	.24	.46
California	4.06	1.86	.54	1.91	2.01	2.03	2.37	.15	1.82
Colorado	5.72	1.14	.36	4.97	2.57	.03	1.74	.14	.43
Connecticut	3.41	1.89	1.78	1.37	6.26	-------	1.05	.12	2.35
Delaware	.60	1.20	.35	.95	.90	-------	1.81	-------	.55
District of Columbia	4.23	1.80	1.06	-------	3.17	.26	2.44	.73	1.25
Florida	.39	.43	.09	1.27	.10	.04	.35	.53	.15
Georgia	.34	.26	.10	.55	.12	.05	.19	.03	.08
Idaho	-------	.02	-------	-------	1.29	-------	-------	-------	-------
Illinois	3.17	.99	2.66	1.85	3.49	.35	1.53	.20	2.01
Indiana	-------	.99	-------	-------	3.57	-------	-------	.21	-------
Iowa	.41	.43	.05	.21	1.25	.70	[1] 0	[2]	.04
Kansas	4.33	1.16	.16	10.77	3.44	.25	.92	.03	1.15
Kentucky [3]	-------	-------	-------	-------	-------	-------	-------	-------	-------
Louisiana	.23	.50	.13	-------	.48	1.66	[1] .77	.90	.16
Maine	3.54	.77	1.02	4.87	1.81	.02	[1] .69	.35	1.61
Maryland	2.42	1.15	1.36	1.19	3.15	-------	1.65	.34	2.37
Massachusetts	3.98	1.65	3.77	1.20	4.80	-------	1.79	.13	1.51
Michigan	3.16	1.19	2.00	1.41	3.71	.43	1.27	.15	1.43
Minnesota	3.13	1.21	.34	-------	5.60	1.57	1.27	.05	.51
Mississippi	5.79	.91	1.99	13.13	.45	.93	2.12	.81	3.89
Missouri	1.20	1.21	.10	.38	4.22	.19	.58	.06	.20
Montana	2.06	.95	.56	.73	3.08	1.77	.98	.11	2.09
Nebraska	-------	.51	-------	-------	.93	-------	-------	.10	-------
New Hampshire [4]	-------	-------	-------	-------	-------	-------	-------	-------	-------
New Jersey	3.23	1.49	1.62	-------	3.44	.12	1.42	.17	3.48
New Mexico [4]	-------	-------	-------	-------	-------	-------	-------	-------	-------
New York	2.61	1.45	1.08	1.17	2.69	.06	1.65	.36	1.55
North Carolina	2.81	.87	.50	-------	.77	1.33	-------	.03	1.94
North Dakota	2.25	.41	.48	1.05	6.00	.86	.24	.05	.46
Ohio	3.66	.94	.73	1.24	3.96	1.32	1.12	.17	1.23
Oklahoma	1.33	.56	.24	1.06	1.16	.69	.53	.72	.78
Oregon	2.82	1.80	.28	1.25	2.53	2.37	.89	.14	.42
Pennsylvania	3.21	1.21	2.98	2.91	3.40	.03	.61	.12	1.47
Rhode Island	-------	1.16	-------	-------	2.12	-------	-------	.13	-------
South Carolina	.38	.66	.01	.32	.05	.61	.07	.07	.06
South Dakota	2.33	.65	.27	.14	4.26	.80	.28	.27	.28
Tennessee	1.26	.41	.56	0	.46	2.17	.49	.21	1.14
Texas [3]	-------	-------	-------	-------	-------	-------	-------	-------	-------
Utah	15.83	1.12	1.05	4.73	1.31	.55	[1] .29	.02	2.08
Vermont	7.02	.33	.27	9.52	3.47	-------	[1] .37	.13	2.64
Virginia	4.37	.85	2.21	-------	1.15	.13	[1] 1.90	.12	4.44
Washington	4.62	1.43	.53	3.73	1.74	1.15	1.21	.22	.68
West Virginia	2.16	.97	1.00	-------	1.79	2.07	.44	.85	1.85
Wisconsin	5.05	.95	4.86	4.59	2.89	1.11	.65	.06	2.03
Wyoming	4.35	.37	.27	.27	1.96	.37	.11	.05	.21

[1] Pulmonary.
[2] Reports not required by law.
[3] Reports received weekly.
[4] Reports received annually.

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 March 28, 1925.

Los Angeles, Calif.

Week ended Mar. 28, 1925:

Number of rats examined	3,642
Number of rats found to be plague infected	7
Number of squirrels examined	549
Number of squirrels found to be plague infected	6

Totals to Mar. 28, 1925:

Number of rats examined	71,191
Number of rats found to be plague infected	159
Number of squirrels examined	5,984
Number of squirrels found to be plague infected	9

Date of discovery of last plague-infected rodent, Apr. 9, 1925.
Date of last human case, Jan. 15, 1925.

Oakland, Calif.

(Including other East Bay communities)

Week ended Mar. 28, 1925:	
Number of rats examined	2,805
Number of rats found to be plague infected	0
Totals to Mar. 28, 1925:	
Number of rats examined	29,717
Number of rats found to be plague infected	21

Date of discovery of last plague-infected rat, Mar. 4, 1925.
Date of last human case, Sept. 10, 1919.

New Orleans, La.

Week ended Mar. 28, 1925:	
Number of vessels inspected	401
Number of inspections made	1,102
Number of vessels fumigated with cyanide gas	40
Number of rodents examined for plague	5,441
Number of rodents found to be plague infected	0
Totals to Mar. 28, 1925:	
Number of rodents examined for plague	65,664
Number of rodents found to be plague infected	12

Date of discovery of last plague-infected rat, Jan. 17, 1925.
Date of last human case, occurring in New Orleans, Aug. 20, 1920.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

Diphtheria.—For the week ended March 28, 1925, 34 States reported 1,444 cases of diphtheria. For the week ended March 29, 1924, the same States reported 1,633 cases of this disease. One hundred and one cities, situated in all parts of the country and having an aggregate population of more than 28,400,000 reported 922 cases of diphtheria for the week ended March 28, 1925. Last year for the corresponding week they reported 1,020 cases. The estimated expectancy for these cities was 988 cases. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Measles.—Twenty-nine States reported 4,420 cases of measles for the week ended March 28, 1925, and 16,340 cases of this disease for the week ended March 29, 1924. One hundred and one cities reported 2,801 cases of measles for the week this year, and 6,435 cases last year.

Scarlet fever.—Scarlet fever was reported for the week as follows: 34 States—this year, 4,154 cases; last year, 3,902; 101 cities—this year, 2,297; last year, 1,939, estimated expectancy, 1,070 cases.

Smallpox.—For the week ended March 28, 1925, 34 States reported 1,006 cases of smallpox. Last year, for the corresponding week, they reported 1,301 cases. One hundred and one cities reported smallpox for the week as follows: 1925, 312 cases; 1924, 570 cases; estimated expectancy, 111 cases. These cities reported 5

deaths from smallpox for the week this year; 4 at Minneapolis and 1 at St. Paul.

Typhoid fever.—Two hundred and ten cases of typhoid fever were reported for the week ended March 28, 1925, by 33 States. For the corresponding week of 1924 the same States reported 203 cases. One hundred and one cities reported 59 cases of typhoid fever for the week this year, and 75 cases for the corresponding week last year. The estimated expectancy for these cities was 47 cases.

Influenza and pneumonia.—Deaths from influenza and pneumonia (combined) were reported for the week by 102 cities as follows: 1925, 1,278 deaths; 1924, 1,297 deaths.

City reports for week ended March 28, 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	7	2	1	7	0	0	31	4
New Hampshire:									
Concord	22,408	0	0	0	0	0	0	0	5
Manchester	81,383	-------	2	1	-------	6	1	-------	6
Nashua	29,234	0	0	0	-------	2	2	0	4
Vermont:									
Barre	[1] 10,008	3	0	0	0	0	4	5	1
Burlington	23,613	0	0	0	-------	1	10	16	4
Massachusetts:									
Boston	770,400	30	60	23	6	3	215	8	26
Fall River	120,912	2	4	2	6	0	0	1	7
Springfield	144,227	3	4	2	2	3	35	1	3
Worcester	191,927	12	5	3	1	0	15	0	4
Rhode Island:									
Pawtucket	68,799	6	1	2	0	0	1	0	1
Providence	242,378	0	11	4	-------	4	2	0	16
Connecticut:									
Bridgeport	[1] 143,555	1	7	6	2	2	0	1	9
Hartford	[1] 138,036	4	8	4	0	0	1	3	6
New Haven	172,967	23	4	1	2	0	31	2	6
MIDDLE ATLANTIC									
New York:									
Buffalo	536,718	19	14	7	0	0	193	4	20
New York	5,927,625	248	238	277	92	28	133	50	210
Rochester	317,867	12	6	21	0	0	47	30	9
Syracuse	184,511	3	6	5	-------	2	9	14	12
New Jersey:									
Camden	124,157	5	4	9	4	0	48	1	4
Newark	438,699	18	17	12	17	1	29	13	17
Trenton	127,390	1	5	1	1	0	8	0	1

[1] Population Jan. 1, 1920.

City reports for week ended March 28, 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			
MIDDLE ATLANTIC—con.									
Pennsylvania:									
Philadelphia	1,922,788	58	75	115	-------	6	349	22	71
Pittsburgh	613,442	59	21	9	-------	7	357	20	48
Reading	110,917	12	3	1	0	0	78	5	1
Scranton	140,636	3	3	4	0	0	1	0	10
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	406,312	8	9	4	5	9	1	7	23
Cleveland	888,519	94	25	32	7	2	8	4	23
Columbus	261,082	5	4	0	-------	12	2	0	22
Toledo	268,338	8	4	5	-------	6	61	3	5
Indiana:									
Fort Wayne	93,573	7	3	0	0	0	6	0	6
Indianapolis	342,718	22	9	0	-------	4	1	8	25
South Bend	76,709	1	1	2	0	0	2	0	5
Terre Haute	68,939	1	1	0	0	0	2	0	1
Illinois:									
Chicago	2,866,121	71	106	58	101	18	605	28	96
Cicero	55,968	4	2	1	0	0	4	0	1
Springfield	61,833	6	1	3	1	0	0	62	0
Michigan:									
Detroit	995,668	56	53	28	10	4	16	12	48
Flint	117,968	6	5	5	1	1	12	0	4
Grand Rapids	145,947	11	3	1	2	2	46	0	6
Wisconsin:									
Madison	42,519	2	1	0	0	0	7	94	2
Milwaukee	484,595	41	14	16	3	1	314	91	21
Racine	64,393	10	1	0	0	0	49	4	5
Superior	[1] 39,671	3	1	1	-------	1	1	0	1
WEST NORTH CENTRAL									
Minnesota:									
Duluth	106,289	2	1	0	0	0	0	3	1
Minneapolis	409,125	78	15	31	-------	1	8	26	19
St. Paul	241,891	9	13	27	0	0	15	22	10
Iowa:									
Davenport	61,262	2	1	2	0	-------	0	0	-------
Des Moines	140,923	0	2	1	0	-------	0	0	-------
Sioux City	79,662	4	2	1	0	-------	0	26	-------
Waterloo	39,667	15	0	0	0	-------	0	3	-------
Missouri:									
Kansas City	351,819	11	9	2	21	17	4	34	22
St. Joseph	78,232	3	2	0	0	0	1	3	0
St. Louis	803,853	42	39	51	2	0	13	11	-------
North Dakota:									
Fargo	24,841	9	1	1	0	0	0	15	0
Grand Forks	14,547	0	0	0	0	-------	0	0	-------
South Dakota:									
Aberdeen	15,829	0	-------	0	0	-------	0	0	-------
Sioux Falls	29,206	0	0	0	17	0	1	0	0
Nebraska:									
Lincoln	58,761	11	2	1	0	0	2	3	1
Omaha	204,382	7	4	2	0	0	0	0	18
Kansas:									
Topeka	52,555	5	1	0	1	1	0	127	4
Wichita	79,261	23	1	4	-------	2	1	1	2
SOUTH ATLANTIC									
Delaware:									
Wilmington	117,728	2	2	0	0	0	2	3	5
Maryland:									
Baltimore	773,580	67	25	24	17	3	3	47	48
Cumberland	32,361	-------	1	0	2	0	0	-------	0
Frederick	11,301	0	1	0	2	0	0	0	2
District of Columbia:									
Washington	[1] 437,571	33	10	10	0	0	30	-------	19

[1] Population Jan. 1, 1920.

City reports for week ended March 28, 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.									
Virginia:									
Lynchburg	30,277	1	0	0	0	0	1	28	4
Norfolk	159,089	41	1	6	0	0	5	69	4
Richmond	181,044	0	2	0	0	0	0	0	4
Roanoke	55,502	4	1	1	0	0	2	0	3
West Virginia:									
Charleston	45,597	10	1	2	0	0	17	1	1
Huntington	57,918	0	1	0	0	----	0	0	----
Wheeling	[1] 56,208	1	2	0	0	0	1	1	5
North Carolina:									
Raleigh	29,171	15	0	0	0	0	1	0	0
Wilmington	35,719	1	0	0	0	0	0	8	3
Winston-Salem	56,230	10	0	1	0	0	4	3	1
South Carolina:									
Charleston	71,245	1	1	0	----	1	0	2	1
Columbia	39,688	3	1	0	0	0	1	1	5
Greenville	25,789	----	0	----	----	----	----	----	----
Georgia:									
Atlanta	222,963	2	2	2	0	0	0	1	12
Brunswick	15,937	----	0	0	1	0	0	----	0
Savannah	89,448	2	1	0	16	2	0	4	2
Florida:									
St. Petersburg	24,403	0	0	0	0	0	0	0	3
Tampa	56,050	1	1	1	0	0	0	0	1
EAST SOUTH CENTRAL									
Kentucky:									
Covington	57,877	----	1	----	----	----	----	----	----
Louisville	257,671	3	5	1	13	1	3	3	17
Tennessee:									
Memphis	170,067	9	6	5	----	3	3	16	9
Nashville	121,128	2	1	0	----	4	0	1	0
Alabama:									
Birmingham	195,901	16	2	2	16	3	0	2	13
Mobile	63,858	0	0	2	3	3	0	0	2
Montgomery	45,383	0	0	0	1	0	0	8	0
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	30,635	0	1	2	0	----	0	1	----
Little Rock	70,916	0	1	1	15	2	2	1	4
Louisiana:									
New Orleans	404,575	13	10	9	4	1	0	0	4
Shreveport	54,590	1	----	0	----	1	0	0	2
Oklahoma:									
Oklahoma	101,150	0	1	2	8	0	0	0	1
Tulsa	102,018	----	1	1	0	----	5	----	----
Texas:									
Dallas	177,274	18	3	11	3	1	0	4	7
Galveston	46,877	0	0	1	0	0	0	0	4
Houston	154,970	11	2	0	0	0	0	1	3
San Antonio	184,727	2	2	2	----	2	0	1	9
MOUNTAIN									
Montana:									
Billings	16,927	1	0	0	0	0	1	18	0
Great Falls	27,787	1	1	1	0	0	0	3	2
Helena	[1] 12,037	0	0	0	0	0	0	0	1
Missoula	[1] 12,668	0	1	1	0	0	2	0	1
Idaho:									
Boise	22,806	0	0	0	0	0	0	0	0
Colorado:									
Denver	272,031	----	9	----	----	2	----	----	7
Pueblo	43,519	8	1	0	----	2	0	3	8
New Mexico:									
Albuquerque	16,648	3	1	0	3	0	0	9	1
Arizona:									
Phoenix	33,899	1	----	1	----	1	0	0	4

[1] Population Jan. 1, 1920.

City reports for week ended March 28, 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			
MOUNTAIN—continued									
Utah:									
Salt Lake City	126,241	18	2	4	0	0	0	50	2
Nevada:									
Reno	12,429	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	[1] 315,685	57	5	2	0	----	3	44	----
Spokane	104,573	----	2	----	----	----	----	----	----
Tacoma	101,731	13	1	2	2	0	1	7	2
Oregon:									
Portland	273,621	20	3	12	38	4	2	10	10
California:									
Los Angeles	666,853	71	40	34	46	8	33	20	25
Sacramento	69,950	----	1	0	1	0	1	----	4
San Francisco	539,038	44	26	20	9	5	11	45	8

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	22	0	0	0	0	0	0	0	3	24
New Hampshire:											
Concord	1	4	0	0	0	1	0	0	0	0	24
Manchester	2	11	0	0	0	0	0	0	0	----	24
Nashua	2	0	0	0	0	1	0	0	0	0	12
Vermont:											
Barre	1	1	0	0	0	0	0	0	0	0	----
Burlington	1	0	0	0	0	0	0	1	0	1	13
Massachusetts:											
Boston	61	108	0	0	0	17	1	5	1	44	258
Fall River	3	4	0	0	0	6	1	0	0	5	43
Springfield	6	30	0	0	0	1	0	0	0	6	45
Worcester	9	12	0	0	0	2	0	0	0	7	48
Rhode Island:											
Pawtucket	1	4	0	0	0	0	0	0	0	0	----
Providence	9	9	0	0	0	1	0	0	0	0	88
Connecticut:											
Bridgeport	7	22	0	0	0	1	0	0	0	0	45
Hartford	6	8	0	0	0	2	0	0	0	6	49
New Haven	6	19	0	0	0	4	0	0	0	12	49
MIDDLE ATLANTIC											
New York:											
Buffalo	18	22	0	0	0	12	0	1	1	53	155
New York	210	331	1	1	0	[1] 116	8	9	1	126	1,565
Rochester	12	74	0	0	0	7	0	0	0	15	84
Syracuse	15	4	0	0	0	3	1	0	0	0	55
New Jersey:											
Camden	4	26	0	6	0	1	0	0	0	1	37
Newark	25	44	0	0	0	9	1	0	0	68	122
Trenton	3	6	0	0	0	3	0	0	1	0	41
Pennsylvania:											
Philadelphia	67	204	0	7	0	43	3	2	0	122	543
Pittsburgh	20	75	1	0	0	13	1	0	0	15	220
Reading	3	15	0	0	0	1	0	1	0	4	43
Scranton	3	3	0	0	0	2	0	0	0	4	----

[1] Population Jan. 1, 1920.
[1] Pulmonary tuberculosis only.

City reports for week ended March 28, 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 NORTH CENTRAL											
Ohio:											
Cincinnati	12	20	2	1	0	10	0	1	0	1	167
Cleveland	33	24	0	0	0	17	2	0	1	26	216
Columbus	7	19	2	9	0	9	0	0	1	6	119
Toledo	13	15	4	0	0	5	0	0	0	23	90
Indiana:											
Fort Wayne	2	8	2	0	0	1	0	0	0	2	30
Indianapolis	11	7	2	21	0	11	0	0	0	16	120
South Bend	3	10	1	0	0	0	0	0	0	1	15
Terre Haute	3	10	0	2	0	1	0	0	0	1	27
Illinois:											
Chicago	88	275	3	1	0	64	2	2	0	138	780
Cicero	2	7	0	0	0	1	0	0	0	1	9
Springfield	1	13	1	0	0	2	0	0	0	0	28
Michigan:											
Detroit	78	141	4	0	0	23	1	1	0	71	268
Flint	6	1	1	0	0	0	1	0	0	0	20
Grand Rapids	8	61	1	1	0	1	0	0	0	8	39
Wisconsin:											
Madison	3	8	1	0	0	0	0	0	0	8	7
Milwaukee	32	24	1	9	0	3	0	0	0	21	106
Racine	5	4	1	1	0	0	0	0	0	2	13
Superior	2	20	4	0	0	3	0	0	0	0	18
WEST NORTH CENTRAL											
Minnesota:											
Duluth	5	28	2	0	0	2	1	0	0	0	25
Minneapolis	30	88	7	10	4	5	1	0	0	2	113
St. Paul	27	47	6	5	1	5	0	0	0	8	70
Iowa:											
Davenport	2	1	2	2	-------	-------	0	0	-------	4	-------
Des Moines	9	2	2	1	-------	-------	0	0	-------	0	-------
Sioux City	2	0	1	0	-------	-------	0	0	-------	0	-------
Waterloo	3	0	0	1	-------	-------	0	0	-------	1	-------
Missouri:											
Kansas City	10	101	3	0	0	5	1	0	0	11	130
St. Joseph	2	1	0	0	0	0	0	0	0	1	-------
St. Louis	33	89	3	5	0	17	1	3	1	4	311
North Dakota:											
Fargo	1	2	0	0	0	0	0	0	0	0	9
Grand Forks	1	0	1	0	-------	-------	0	0	-------	0	-------
South Dakota:											
Aberdeen	-------	1	-------	0	-------	-------	-------	0	-------	0	-------
Sioux Falls	3	1	1	0	0	0	0	0	0	0	7
Nebraska:											
Lincoln	4	3	1	1	0	0	0	0	0	3	11
Omaha	4	5	2	44	0	3	0	0	0	0	76
Kansas:											
Topeka	2	2	1	0	0	1	0	0	0	0	26
Wichita	2	0	4	0	0	0	0	0	0	1	32
SOUTH ATLANTIC											
Delaware:											
Wilmington	2	5	0	0	0	2	0	1	0	0	25
Maryland:											
Baltimore	38	37	0	1	0	19	3	1	0	86	236
Cumberland	1	0	0	0	0	0	0	0	0	-------	9
Frederick	1	0	0	0	0	0	0	0	0	0	6
District of Columbia:											
Washington	22	27	1	3	0	12	1	0	0	17	131
Virginia:											
Lynchburg	0	0	0	0	0	0	1	0	0	2	12
Norfolk	1	1	1	0	0	3	1	0	0	15	-------
Richmond	3	0	0	0	0	4	1	0	0	0	49
Roanoke	1	0	1	0	0	1	0	0	0	0	22
West Virginia:											
Charleston	1	0	0	3	0	2	0	1	1	0	23
Huntington	1	2	0	0	-------	-------	0	0	-------	0	-------
Wheeling	1	2	0	0	0	2	0	1	1	0	27
North Carolina:											
Raleigh	0	1	0	5	0	0	0	1	0	4	7
Wilmington	1	1	0	4	0	0	0	0	0	0	12
Winston-Salem	1	6	2	10	0	0	0	0	0	0	15

City reports for week ended March 28, 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		
SOUTH ATLANTIC—continued											
South Carolina:											
Charleston	0	0	0	0	0	3	0	0	0	0	33
Columbia	0	0	1	0	0	2	1	0	0	6	26
Greenville	1	----	1	----	----	----	0	----	----	----	----
Georgia:											
Atlanta	4	1	4	1	0	7	1	0	0	5	69
Brunswick	0	0	0	0	0	1	0	1	0	----	2
Savannah	1	0	1	0	0	6	1	0	0	3	37
Florida:											
St. Petersburg	3	0	1	0	0	0	0	0	0	0	22
Tampa	0	1	0	0	0	7	1	0	0	0	25
EAST SOUTH CENTRAL											
Kentucky:											
Covington	2	----	0	----	----	----	0	----	----	----	----
Louisville	5	14	1	0	0	10	0	1	0	15	104
Tennessee:											
Memphis	3	7	1	4	0	4	0	0	1	28	60
Nashville	2	8	1	14	0	6	1	1	0	0	41
Alabama:											
Birmingham	1	19	0	56	0	16	1	8	0	2	86
Mobile	0	0	1	0	0	1	0	0	0	0	18
Montgomery	0	2	0	0	0	0	0	0	0	0	21
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	1	0	1	----	----	0	0	----	0	----
Little Rock	1	0	0	0	0	3	0	0	0	1	----
Louisiana:											
New Orleans	4	11	4	0	0	20	2	5	1	4	151
Shreveport	----	1	----	1	0	1	----	0	0	0	32
Oklahoma:											
Oklahoma	2	2	5	0	0	1	0	2	0	1	19
Tulsa	1	1	3	0	----	----	1	0	----	----	----
Texas:											
Dallas	2	7	6	0	0	4	0	0	0	12	64
Galveston	0	0	1	2	0	0	0	2	0	0	8
Houston	1	2	0	19	0	3	0	0	0	0	43
San Antonio	0	0	0	0	0	12	1	2	0	----	75
MOUNTAIN											
Montana:											
Billings	1	1	1	0	0	0	0	0	0	0	4
Great Falls	1	2	1	0	0	0	0	0	0	0	8
Helena	1	0	0	0	0	1	0	0	0	0	8
Missoula	1	1	1	0	0	0	0	0	0	0	4
Idaho:											
Boise	1	3	1	1	0	0	0	0	0	0	3
Colorado:											
Denver	11	----	3	----	0	11	0	----	0	----	86
Pueblo	1	0	1	0	0	0	0	0	0	0	20
New Mexico:											
Albuquerque	1	1	0	0	0	1	0	0	0	0	5
Arizona:											
Phoenix	----	2	----	3	0	19	----	0	0	0	38
Utah:											
Salt Lake City	3	4	2	0	0	3	0	0	0	5	30
Nevada:											
Reno	0	0	0	1	0	0	0	0	0	2	5
PACIFIC											
Washington:											
Seattle	9	12	2	13	----	----	0	1	----	58	----
Spokane	4	----	8	----	----	----	1	----	----	----	----
Tacoma	2	2	2	4	0	1	0	2	0	1	22
Oregon:											
Portland	6	5	4	12	0	6	1	0	0	8	----
California:											
Los Angeles	15	38	2	35	0	20	2	3	0	68	243
Sacramento	2	1	0	1	0	4	0	3	0	----	32
San Francisco	17	19	3	9	0	12	2	0	0	63	150

City reports for week ended March 28, 1925—Continued

Division, State, and city	Cerebrospinal meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)			Typhus fever	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths	Cases	Deaths
NEW ENGLAND											
Massachusetts:											
Boston	2	0	0	0	0	0	0	0	0	2	0
Fall River	0	0	0	0	0	0	0	1	0	0	0
Connecticut:											
Bridgeport	0	0	1	1	0	0	0	0	0	0	0
MIDDLE ATLANTIC											
New York:											
New York	4	5	5	5	0	0	1	2	0	0	0
New Jersey:											
Newark	0	0	2	1	0	0	0	2	0	0	0
Pennsylvania:											
Philadelphia	1	0	4	4	0	0	0	0	0	0	0
Scranton	1	0	0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	0	0	0	1	0	0	0	0	0	0	0
Cleveland	1	1	1	1	0	0	0	1	0	0	0
Illinois:											
Chicago	2	1	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL											
Missouri:											
St. Joseph	1	1	0	0	0	0	0	0	0	0	0
St. Louis	0	0	0	0	0	0	0	1	0	0	0
North Dakota:											
Grand Forks	0	0	0	0	0	0	0	1	0	0	0
SOUTH ATLANTIC											
Delaware:											
Wilmington	0	0	0	0	0	0	0	0	0	2	0
Maryland:											
Baltimore	1	0	1	2	0	0	0	0	0	0	0
North Carolina:											
Winston-Salem	0	0	0	0	0	1	0	0	0	0	0
Florida:											
Tampa	0	0	0	0	1	0	0	0	0	0	0
EAST SOUTH CENTRAL											
Alabama:											
Birmingham	1	1	0	0	0	0	0	0	0	0	0
Mobile	0	0	0	0	0	1	0	0	0	0	0
WEST SOUTH CENTRAL											
Arkansas:											
Little Rock	0	0	0	0	1	0	0	0	0	0	0
Louisiana:											
New Orleans	0	0	1	1	0	0	0	0	0	0	0
Shreveport	0	0	0	0	0	2	------	0	0	0	0
Oklahoma:											
Oklahoma	0	0	0	0	1	0	0	0	0	0	0
MOUNTAIN											
Colorado:											
Pueblo	0	1	0	0	0	0	0	0	0	0	0
PACIFIC											
Oregon:											
Portland	1	0	1	2	0	0	0	0	0	0	0
California:											
Los Angeles	1	0	------	0	1	0	0	0	0	0	0
San Francisco	0	0	1	0	0	0	0	0	0	0	0

The following table gives the rates per hundred thousand population for 105 cities for the 10-week period ended March 28, 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, January 18 to March 28, 1925—Annual rates per 100,000 population [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Jan. 24	Jan. 31	Feb. 7	Feb. 14	Feb. 21	Feb. 28	Mar. 7	Mar. 14	Mar. 21	Mar. 28
Total	[2] 163	[3] 166	[2] 175	[2] 168	149	[4] 169	162	[5] 168	167	[6] 168
New England	171	199	191	246	241	[4] 189	233	176	147	119
Middle Atlantic	175	155	171	165	163	178	167	214	196	231
East North Central	130	[3] 135	145	132	123	119	114	128	134	112
West North Central	199	251	255	259	209	299	282	201	199	247
South Atlantic	[2] 138	128	[2] 153	[2] 183	156	114	104	[5] 93	136	95
East South Central	80	97	63	69	80	51	63	40	69	57
West South Central	162	148	176	162	125	162	144	158	97	121
Mountain	239	134	191	95	162	153	86	105	143	134
Pacific	223	293	270	180	165	258	235	197	249	[6] 179

MEASLES CASE RATES

Total	[2] 213	[3] 214	[2] 254	[2] 297	383	[4] 358	418	[5] 449	506	[6] 507
New England	497	484	576	661	720	[4] 585	656	542	725	755
Middle Atlantic	187	205	205	287	373	343	428	518	598	633
East North Central	379	[3] 373	453	515	688	632	789	710	775	798
West North Central	27	21	17	31	27	73	68	75	93	89
South Atlantic	[2] 38	37	[2] 49	[2] 98	110	81	100	[5] 150	189	135
East South Central	74	91	51	74	51	46	86	11	69	34
West South Central	14	14	37	51	14	51	23	88	42	9
Mountain	248	286	782	153	620	916	29	763	573	38
Pacific	55	17	61	29	64	61	107	110	189	[6] 151

SCARLET FEVER CASE RATES

Total	[2] 370	[3] 364	[2] 412	[2] 400	390	[4] 408	395	[5] 432	427	[6] 419
New England	596	534	614	561	606	[4] 558	584	534	544	604
Middle Atlantic	326	322	373	407	376	412	372	439	417	405
East North Central	369	[3] 379	426	397	432	434	433	497	498	483
West North Central	804	779	871	728	742	734	775	719	792	755
South Atlantic	[2] 189	185	[2] 255	[2] 277	167	203	171	[5] 224	146	167
East South Central	183	217	97	212	223	183	194	355	286	286
West South Central	195	204	162	121	125	144	185	107	134	162
Mountain	305	258	334	382	248	315	286	200	429	248
Pacific	220	226	258	177	186	223	218	229	218	[6] 222

SMALLPOX CASE RATES

Total	[2] 70	[3] 67	[2] 76	[2] 79	66	[4] 66	62	[5] 61	63	[6] 58
New England	0	0	0	0	0	[4] 0	0	0	0	0
Middle Atlantic	6	9	2	4	2	3	1	5	8	7
East North Central	48	[3] 35	39	35	56	28	42	39	32	33
West North Central	180	195	145	193	126	120	114	124	102	135
South Atlantic	[2] 38	45	[2] 62	[2] 98	67	43	51	[5] 60	57	67
East South Central	675	652	823	675	532	583	652	446	646	423
West South Central	32	60	125	139	83	116	74	74	107	107
Mountain	95	48	29	162	86	57	48	95	67	19
Pacific	209	177	267	220	215	313	206	247	212	[6] 191

[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] Wilmington, Del., not included. Report not received at time of going to press.
[3] Racine, Wis., not included.
[4] Hartford, Conn., not included.
[5] Tampa, Fla., not included.
[6] Spokane, Wash., not included.

Summary of weekly reports from cities, January 18 to March 28, 1925—Annual rates per 100,000 population—Continued

TYPHOID FEVER CASE RATES

	Week ended—									
	Jan. 24	Jan. 31	Feb. 7	Feb. 14	Feb. 21	Feb. 28	Mar. 7	Mar. 14	Mar. 21	Mar. 28
Total	[2] 17	[3] 18	[2] 13	[2] 13	11	[4] 14	11	[5] 9	12	11
New England	20	7	30	20	0	[4] 13	7	5	30	12
Middle Atlantic	20	19	13	6	10	8	10	5	8	7
East North Central	11	[3] 10	8	6	6	7	11	4	7	3
West North Central	6	12	0	10	4	17	6	10	8	6
South Atlantic	[2] 11	37	[2] 17	[2] 34	8	20	8	[5] 21	22	12
East South Central	29	23	11	40	34	34	34	34	46	57
West South Central	42	60	23	46	42	42	28	28	23	42
Mountain	48	19	29	19	38	76	10	19	0	0
Pacific	15	3	17	12	23	9	15	15	0	[6] 28

INFLUENZA DEATH RATES

Total	[2] 22	[3] 23	[2] 30	[2] 28	30	[4] 34	30	[5] 34	42	[6] 33
New England	10	27	47	27	17	[4] 40	17	35	30	30
Middle Atlantic	20	16	24	22	21	20	15	24	29	22
East North Central	18	[3] 12	13	17	18	24	27	33	49	40
West North Central	20	15	20	11	22	37	35	33	42	46
South Atlantic	[2] 23	39	[2] 49	[2] 55	55	49	53	[5] 29	53	12
East South Central	63	74	69	63	74	126	103	91	120	86
West South Central	92	82	97	122	153	148	143	107	76	36
Mountain	10	38	57	57	57	19	19	48	48	38
Pacific	12	20	41	4	12	29	29	16	12	53

PNEUMONIA DEATH RATES

Total	[2] 211	[3] 206	[2] 225	[2] 222	216	[4] 201	205	[5] 222	217	[6] 206
New England	216	241	211	239	241	[4] 242	226	229	211	219
Middle Atlantic	234	230	253	231	216	185	210	214	217	199
East North Central	142	[3] 145	164	168	184	171	195	241	222	214
West North Central	120	118	134	131	131	166	140	175	173	166
South Atlantic	[2] 275	252	[2] 315	[2] 270	252	305	268	[5] 241	290	252
East South Central	320	303	326	320	320	292	269	366	286	269
West South Central	362	229	352	464	408	260	229	178	178	168
Mountain	324	315	191	277	219	267	162	210	172	200
Pacific	208	217	196	192	213	163	139	155	131	159

[2] Wilmington, Del., not included. Report not received at time of going to press.
[3] Racine, Wis., not included.
[4] Hartford, Conn., not included.
[5] Tampa, Fla., not included.
[6] Spokane, Wash., 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

CANADA

Communicable diseases—Ontario—March 1–28, 1925.—During the four weeks ended March 28, 1925, communicable diseases were notified in the Province of Ontario, Canada, as follows:

Disease	1925		1924	
	Cases	Deaths	Cases	Deaths
Cerebrospinal meningitis		3	9	7
Chancroid	2		1	
Chicken pox	398		504	
Diphtheria	265	15	250	25
German measles	27		191	1
Goiter	63	5	13	3
Gonorrhea	110		199	
Influenza		55		21
Lethargic encephalitis	7	4	5	4
Measles	1,663	7	2,811	8
Mumps	1,281		1,578	2
Pneumonia		220		251
Poliomyelitis (infantile paralysis)	1	1		
Scarlet fever	681	8	1,134	28
Septic sore throat	7	2	5	1
Smallpox	16		166	28
Syphilis	101		215	
Tuberculosis	159	80	155	100
Typhoid fever	72	8	25	2
Whooping cough	464	13	140	10

Smallpox was reported during the period at eight localities, the greatest number of cases being reported at Welland, viz, four. At two localities three cases each occurred.

ESTHONIA

Typhoid and paratyphoid fever—Typhus fever—January, 1925.—During the month of January, 1925, 36 cases of typhoid fever, with 10 cases of paratyphoid fever, and 4 cases of typhus fever were reported in the Republic of Esthonia. Population, 1,107,059.

FINLAND

Lethargic encephalitis—Typhoid fever—February, 1925.—During the period February 1 to 28, 1925, 7 cases of lethargic encephalitis and 69 cases of typhoid fever with 29 cases of paratyphoid fever, were reported in Finland. Population, 3,435,249, estimated.

ITALY

Malta fever—Sicily—February 23–March 15, 1925.—Malta fever has been reported in the island of Sicily, Italy, as follows: *Catania*—February 23 to March 15, 1925, three cases, occurring in the city of Catania; *Syracuse* (province)—February 23 to March 1, 1925, one case.

MALTA

Lethargic encephalitis—Malta (undulant) fever—Typhoid fever—February 16–28, 1925.—During the period February 16 to 28, 1925, 2 cases of lethargic encephalitis, 11 cases of Malta (undulant) fever, and 3 cases of typhoid fever were reported in the island of Malta. Population, 223,088.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW 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 April 17, 1925 [1]

CHOLERA

Place	Date	Cases	Deaths	Remarks
India				Jan. 25–Feb. 7, 1925: Cases, 4,415; deaths, 2,604.
Calcutta	Feb. 15–28	45	25	
Madras	Feb. 22–Mar. 7	6	6	
Rangoon	Feb. 15–28	5	4	
Siam:				
Bangkok	Feb. 15–21	1	1	

PLAGUE

Ceylon:				
Colombo	Feb. 15–28	1	1	
India				Jan. 25–Feb. 7, 1925: Cases, 7,661. deaths, 6,298.
Bombay	Feb. 15–21		1	
Rangoon	Feb. 15–28	24	22	
Java:				
East Java—				
Soerabaya	Feb. 1–7	1	1	
Palestine:				
Jerusalem	Mar. 3–9	1		

SMALLPOX

Arabia:				
Aden	Mar. 1–7	1		
Canada:				
British Columbia—				
Ocean Falls	Mar. 21–27	3		Mild cases.
Ontario				Mar. 1–28, 1925: Cases, 16. Corresponding period, year 1924—cases, 166; deaths, 28.
China:				
Hongkong	Feb. 15–21	2	2	
Shanghai	Feb. 15–Mar. 7		4	
Dominican Republic:				
Puerta Plata	Mar. 15–21	2		
Egypt:				
Alexandria	Feb. 26–Mar. 4	1		
Great Britain:				
England and Wales	Mar. 15–21	133		

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

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received During Week Ended April 17, 1925—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
India				Jan. 25–Feb. 7, 1925: Cases, 5,967; deaths, 1,483.
Bombay	Feb. 15–21	52	16	
Calcutta	Feb. 15–28	544	410	
Karachi	Mar. 1–7	8	3	
Madras	Feb. 22–Mar. 7	173	98	
Rangoon	Feb. 15–28	217	49	
Java:				
East Java—				
Soerabaya	Feb. 1–7	87	8	
Mexico:				
Mexico City	Feb. 15–Mar. 21	22		Including municipalities in Federal District.
Salina Cruz	Feb. 22–28	2		
Vera Cruz	Mar. 23–29		1	
Persia:				
Teheran	Jan. 1–31		10	
Peru:				
Arequipa	Jan. 1–31		3	
Siam:				
Bangkok	Feb. 15–21	7	7	
Spain:				
Malaga	Mar. 15–21		2	
Valencia	Mar. 15–21	1		
Syria:				
Beirut	Feb. 11–20	1		
Damascus	Feb. 11–20	22		

TYPHUS FEVER

Algeria:				
Algiers	Mar. 1–10	2		
Esthonia				Jan. 1–31, 1925: Cases, 4.
Mexico:				
Mexico City	Mar. 8–14	4		
Peru:				
Arequipa	Dec. 1–31		2	
Union of South Africa:				
Cape Province—				
Port Elizabeth	Feb. 22–28	1		
Natal—				
Durban	Feb. 15–21	1		

Reports Received from December 27, 1924, to April 10, 1925 [1]

CHOLERA

Place	Date	Cases	Deaths	Remarks
Ceylon				June 29–Dec. 27, 1924: Cases, 14; deaths, 13.
Colombo	Nov. 16–22	1		
Do	Jan. 11–24	2	2	
India				Oct. 19, 1924, to Jan. 3, 1925: Cases, 27,164; deaths, 16,228. Jan. 4–24, 1925: Cases, 7,941; deaths, 4,705.
Bombay	Nov. 23–Dec. 20	4	4	
Do	Jan. 18–24	1	1	
Calcutta	Oct. 26–Jan. 3	59	51	
Do	Jan. 4–Feb. 14	98	83	
Madras	Nov. 16–Jan. 3	69	40	
Do	Jan. 4–Feb. 21	131	92	
Rangoon	Nov. 9–Dec. 20	9	2	
Do	Jan. 4–31	6	4	
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	
Do	Jan. 18–Feb. 7	5	2	

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

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from December 27, 1924, to April 10, 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. 2-Jan. 3	30	13	
Do	Jan. 18-24	3	1	
Brazil:				
Bahia	Feb. 15-Jan. 10	3	3	
British East Africa:				
Tanganyika Territory	Nov. 23-Dec. 27	17	10	
Uganda	Aug.-Nov., 1924	242	211	
Canary Islands:				
Las Palmas	Jan. 21-23	2		Stated to be endemic.
Do	Feb. 4	1		Stated to have been infected with plague Sept. 30, 1924.
Realejo Alto	Dec. 19	3	1	Vicinity of Santa Cruz de Teneriffe.
Teneriffe—				
Santa Cruz	Jan. 3	1		In vicinity.
Celebes:				
Macassar	Oct. 29			Epidemic.
Ceylon:				
Colombo	Nov. 9-Jan. 3	12	9	
Do	Jan. 4-Feb. 18	8	10	Five plague rodents.
China:				
Foochow	Dec. 28-Jan. 3			Present.
Nanking	Nov. 23-Jan. 31			Do.
Shing Hsien	October, 1924		790	
Ecuador:				
Chimborazo Province—				
Alausi District	Jan. 14		14	At two localities on Guayaquil and Quito Railway.
Guayaquil	Nov. 16-Dec. 31	9	3	Rats taken, 27,004; found infected, 92.
Do	Jan. 1-Mar. 15	59	25	Rats taken, 45,027; rats found infected, 234.
Naranjito	Feb. 16-Mar. 15	1		
Yaguachi	Feb. 1-Mar. 15	2	1	
Egypt				Year 1924: Cases, 373. Jan. 1-28, 1925: Cases, 15.
City—				
Alexandria	Year 1924	2	2	Last case, Nov. 26.
Ismailia	do	1	1	Last case, July 6.
Port Said	do	6	4	Last case, Dec. 7.
Suez	do	20	13	Last case, Dec. 20.
Province—				
Dakhalia	Jan. 1-8	1	1	
Kalioubiah	do	3		
Menoufieh	do	7	3	
Gold Coast				September-November, 1924: Deaths, 48.
Hawaii:				
Honokaa	Nov. 4	1		Plague-infected rodents found Dec. 9, 1924, and Jan. 15, 1925.
India				Oct. 19, 1924, to Jan. 3, 1925: Cases, 28,154; deaths, 21,505. Jan. 4-24, 1925: Cases, 12,364; deaths, 10463.
Bombay	Nov. 22-Jan. 3	4	3	
Do	Jan. 4-17	2	2	
Do	Feb. 8-14	3	2	
Calcutta	Jan. 18-24	1	1	
Karachi	Nov. 30-Dec. 6	2	1	
Do	Jan. 4-Feb. 21	12	11	
Madras Presidency	Nov. 23-Jan. 3	685	487	
Do	Jan. 4-24	658	511	
Rangoon	Oct. 26-Jan. 3	26	25	
Do	Jan. 4-Feb. 7	55	47	
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	
Saigon	Dec. 25-31	1	1	Including 100 square kilometers of surrounding territory.
Do	Jan. 11-17	2	1	Do.
Iraq	June 29-Dec. 13	18	13	
Japan	Aug. 10-Dec. 6	19		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from December 27, 1924, to April 10, 1925—Continued

PLAGUE—Continued

Place	Date	Cases	Deaths	Remarks
Java:				
East Java—				
Blitar	Nov. 11-22			Province of Kediri; epidemic.
Pare	Nov. 29			Do.
Sidoardjo	Jan. 2			Declared epidemic, Province of Soerabaya.
Soerabaya	Nov. 16-Dec. 31	71	72	
Do	Jan. 15-22	3	2	
West Java—				
Cheribon	Oct. 14-Nov. 3		14	
Do	Nov. 18-Dec. 22		80	
Do	Jan. 1-14		44	Cheribon Province.
Do	Jan. 30			Present.
Pasoeroean	Dec. 27			Province. Epidemic in one locality.
Pekalongan	Oct. 14-Nov. 3		29	
Do	Nov. 18-Dec. 31		177	
Do	Jan. 1-14		81	Pekalongan Province.
Probalingga	Dec. 27			Province. Epidemic.
Tegal	Oct. 14-Dec. 31		26	
Do	Jan. 1-14		37	Pekalongan Province.
Madagascar:				
Fort Dauphin (port)	Nov. 1-Dec. 15	12	5	
Itasy Province				Nov. 1-Dec. 15, 1924: Cases, 4; deaths, 2.
Majunga (port)	Nov. 1-30	1	1	
Moramanga Province				Nov. 1-Dec. 15, 1924: Cases, 49; deaths, 34. Jan. 16-31, 1925: Cases, 4; deaths, 4.
Tamatave (port)	Nov. 1-30	1	1	
Tananarive Province				Oct. 16-Dec. 31, 1924: Cases, 298; deaths, 274.
Do				Jan. 1-31: Cases, 135; deaths, 114.
Tananarive (town)	Oct. 16-Nov. 30	8	7	Bubonic, pneumonic, septicemic.
Do	Dec. 16-31	4	4	
Do	Jan. 1-15	1	1	
Mauritius Island				Sept. 7-Oct. 18, 1924: Cases, 60, deaths, 53.
Morocco:				
Marrakech				Feb. 9, 1925: Present in native quarter of town. Stated to be pneumonic in form and of high mortality.
Nigeria				August-November, 1924: Cases, 387; deaths, 317.
Peru	February, 1925	6	6	
Siam:				
Bangkok	Dec. 28-Jan. 3	1	1	
Do	Jan. 25-Feb. 14	2	1	
Siberia:				
Transbaikalia—				
Turga	October, 1924		3	On Chita Railroad.
Straits Settlements:				
Singapore	Nov. 9-15	1	1	
Do	Jan. 4-Feb. 28	8	6	
Syria:				
Beirut	Jan. 11-20	1		
Turkey:				
Constantinople	Jan. 9-15	5	5	
Union of South Africa	Jan. 4-Feb. 14	40	15	Native cases, 3; deaths, 1; white, 16 cases, 6 deaths.
Cape Province—				
De Aar District	Nov. 22-Jan. 3	4	1	Native.
Do	Jan. 4-10		2	Natives; on farms.
Do	Jan. 25-31	1	1	Malay camp.
Dronfield	Dec. 7-13	1		8 miles from Kimberley.
Edenburg (town)	Jan. 25-31			Plague infected house mouse.
Kimberley	Dec. 7-27	3	2	
Do	Feb. 1-7	1	1	On farm.
Maraisburg District	Nov. 22-Dec. 13	4	2	Bubonic, on Goedshoop Farm.
Steynsburg District	Jan. 4-10	1		Native; on farm.
Orange Free State—				
Bloemfontein District	Dec. 21-Jan. 3	5	2	
Do	Jan. 11-17	1	1	Native; on farm.
Ficksburg District	Dec. 28-Jan. 3	1	1	
Hoopstad District	Dec. 7-13	1		On farm.
Kroonstad District	Nov. 22-Jan. 3	2	1	
Do	Jan. 18-24	1	1	Native; on farm.
Philippolis District	Dec. 21-27	1		
Vredefort District	Dec. 7-20	2	2	On farms.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from December 27, 1924, to April 10, 1925—Continued

PLAGUE—Continued

Place	Date	Cases	Deaths	Remarks
Union of South Africa—Con.				
Transvaal—				
Boshof District	Dec. 7-Jan. 3	3	3	On farm.
Do	Jan. 11-Feb. 14	28	9	Native, 5 cases; white, 6 fatal cases. On farms.
Smithfield	Jan. 11-17	1		
Winburg District	Feb. 8-14	1		On farm. Native.
Wodehouse District	Feb. 1-7	2	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. 8, 1924. Plague rat found. Vessel left for Tamatave, Madagascar, Nov. 12, 1924.
Steamship	November, 1924	1	1	At Majunga, Madagascar, from Djibuti, Red Sea port.

SMALLPOX

Algeria				July 1-Dec. 31, 1924: Cases, 409.
Algiers	Jan. 1-Feb. 28	6		Jan. 1-20, 1925: Cases, 107.
Arabia:				
Aden	Jan. 25-Feb. 28	9	1	
Bolivia:				
La Paz	Nov. 1-Dec. 31	20	11	
Do	Jan. 1-31		5	
Brazil:				
Pernambuco	Nov. 9-Jan. 3	100	27	
Do	Jan. 4-Feb. 14	78	35	
British East Africa:				
Kenya—				
Mombasa	Jan. 18-24	1		
Unganda—				
Entebbe	Oct. 1-31	4		
British South Africa:				
Northern Rhodesia	Oct. 28-Dec. 15	57	2	
Do	Jan. 27-Feb. 2	3		Natives.
Southern Rhodesia	Jan. 29-Feb. 4	1		
Canada:				
Alberta—				
Calgary	Mar. 15-21	1		Stated to have been contracted in Ontario.
British Columbia—				
Ocean Falls	Mar. 7-20	3		Very mild.
Vancouver	Dec. 14-Jan. 3	32		
Do	Jan. 4-Mar. 21	268		
Victoria	Jan. 18-Feb. 7	2		
Manitoba—				
Winnipeg	Dec. 7-Jan. 3	14		
Do	Jan. 4-Feb. 27	30		
New Brunswick—				
Bonaventure and Gaspe Counties.	Jan. 1-31	1		
Northumberland	Feb. 8-14	1		County.
Ontario				Nov. 30-Dec. 27, 1924: Cases, 33. Dec. 28, 1924, to Feb. 28, 1925: Cases, 41; deaths, 1.
Hamilton	Jan. 24-30	1		
Ceylon				July 27-Nov. 29, 1924: Cases, 27; deaths, 1.
Colombo	Jan. 18-Feb. 7	4		
China:				
Amoy	Nov. 9-Feb. 14			Present. Feb. 22-28: One death.
Antung	Nov. 17-Dec. 28	5		
Do	Jan. 5-Feb. 14	15	1	
Foochow	Nov. 2-Feb. 14			Present.
Hongkong	Nov. 9-Jan. 3	6	2	
Do	Jan. 4-Feb. 7	9	7	
Manchuria—				
Dairen	Jan. 19-Feb. 1	2		
Harbin	Jan. 15-Feb. 11	5		
Nanking	Jan. 4-21			Do.
Shanghai	Dec. 7-27	1	2	
Do	Jan. 18-24	1		
Do	Feb. 1-14	3	4	Deaths among Chinese.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from December 27, 1924, to April 10, 1925—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Chosen:				
Seoul	Dec. 1-31	1		
Colombia:				
Buenaventura	Feb. 15-28	2		
Czechoslovakia				April-June, 1924: Cases, 1; occurring in Province of Moravia.
Dominican Republic:				
Puerta Plata	Mar. 8-14	1		
Ecuador:				
Guayaquil	Nov. 16-Dec. 15	4		
Egypt:				
Alexandria	Nov. 12-Dec. 31	10		
Do	Jan. 8-28	8		
Esthonia				Dec. 1-31, 1924: Cases, 2.
France				July-December, 1924: Cases, 81.
Dunkirk	Mar. 2-8	1		From vessel. In quarantine.
St. Malo	Feb. 2-8	7	1	Believed to have been imported on steamship Ruyth from Sfax, Tunis.
Germany				June 29-Nov. 8, 1924: Cases, 7.
Frankfort-on-Main	Jan. 1-10	1		
Gibraltar	Dec. 8-14	1		
Gold Coast				July-September, 1924: Cases, 82; deaths, 1.
Great Britain:				
England and Wales	Nov. 23-Jan. 3	472		
Do	Jan. 4-Mar. 14	1,344		
Newcastle-on-Tyne	Jan. 18-Feb. 21	9		
Do	Mar. 1-7	1		
Greece				January-June, 1924: Cases, 170; deaths, 27.
Do				July-December, 1924: Cases, 38; deaths, 26.
Saloniki	Nov. 11-Dec. 22	3		
India				Oct. 19, 1924, to Jan. 3, 1925: Cases, 12,564; deaths, 2,857.
Bombay	Nov. 2-Jan. 3	30	18	
Do	Jan. 4-Feb. 14	160	90	Jan. 4-24, 1925: Cases, 7,921; deaths, 1,642.
Calcutta	Oct. 26-Jan. 8	307	170	
Do	Jan. 4-Feb. 14	803	491	Mar. 5, 1925: Epidemic.
Karachi	Nov. 16-Jan. 3	16	2	
Do	Jan. 4-Feb. 14	52	6	
Do	Feb. 22-28	13	6	
Madras	Nov. 16-Jan. 3	122	48	
Do	Jan. 4-Feb. 21	379	114	
Rangoon	Oct. 26-Jan. 3	86	28	
Do	Jan. 4-Feb. 7	287	49	
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-Jan. 3	17	5	Including 160 sq. km. of surrounding country.
Do	Jan. 4-10	3	1	
Do	Jan. 25-31	5	2	Do.
Tonkin	Aug. 1-Sept. 30	19	7	
Iraq	June 29-Dec. 13	137	66	
Bagdad	Nov. 9-Dec. 27	2	1	
Italy				June 29-Dec. 27, 1924: Cases, 63.
Jamaica				Nov. 30, 1924-Jan. 3, 1925: Cases, 50. Reported as alastrim.
Do				Jan. 4-31, 1925: Cases, 43. Reported as alastrim.
Kingston	Nov. 30-Dec. 27	4		Reported as alastrim.
Japan				Aug. 1-Nov. 15, 1924: Cases, 4
Nagasaki	Feb. 9-15	3		
Taiwan	Jan. 1-31	1		
Java:				
East Java—				
Pasoeroean	Oct. 26-Nov. 1	9	1	
Do	Nov. 12-19			Epidemic in 2 native villages.
Soerabaya	Oct. 19-Dec. 31	685	212	
Do	Jan. 15-28	171	23	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from December 27, 1924, to April 10, 1925—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Java—Continued				
West Java—				
Batam	Oct. 14–20	2		
Batavia	Oct. 21-Nov. 14	2		
Do	Dec. 20–Jan. 2	19	4	
Buitenzorg	Dec. 25–31	1		Batavia Residency.
Cheribon	Oct. 14–Nov. 24	15		
Do	Jan. 1–7	2		Cheribon Residency.
Pekalongan	Oct. 14–Nov. 24	22		
Do	Dec. 25–31	3		Province.
Pemalang	Jan. 8–14	1		Pekalongan Residency.
Preanger	Nov. 18–24	1		
Latvia				Oct. 1–Nov. 30, 1924: Cases, 5.
Lithuania				Jan. 1–31, 1925: Cases, 2.
Mexico:				
Durango	Dec. 1–31		5	
Do	Jan. 1–Feb. 28		10	
Guadlajara	Dec. 23–29		1	
Do	Jan. 6–Mar. 23		4	
Mexico City	Nov. 23–Dec. 27	5		
Do	Jan. 11–Feb. 14	9		
Monterey				Jan. 24, 1925: Outbreak. Mar. 14, 1925, present.
Salina Cruz	Dec. 1–31	1	1	
Saltillo	Feb. 22–28		1	
Tampico	Dec. 11–31	5	4	
Do	Jan. 1–Mar. 20	51	16	
Vera Cruz	Dec. 1–Jan. 3		10	
Do	Jan. 5–Mar. 22		36	
Villa Hermosa	Dec. 28–Jan. 10			Present. Locality, capital, State of Tobasco.
Nigeria				January–June, 1924: Cases, 357; deaths, 87.
Do				July–November, 1924: Cases, 87; deaths, 25.
Persia:				
Teheran				Sept. 23–Dec. 21, 1924: Deaths, 12.
Peru:				
Arequipa	Nov. 24–30		1	
Poland				Sept. 21–Dec. 28, 1924: Cases, 30; deaths, 2.
Portugal:				
Lisbon	Dec. 7–Jan. 3	17		
Do	Jan. 4–Mar. 14	78	7	
Oporto	Nov. 30–Dec. 27	3	2	
Do	Jan. 11–Mar. 14	3		
Russia				January–June, 1924: Cases, 9,683; July–September, 1924: Cases, 1,251.
Siam:				
Bangkok	Dec. 28–Jan. 3	1	1	
Do	Jan. 18–Feb. 14		12	
Sierra Leone:				
Freetown	Feb. 7–14	2		From S. S. Elmina.
Spain:				
Barcelona	Nov. 27–Dec. 31		5	
Cadiz	Nov. 1–Dec. 31		51	
Do	Jan. 1–31		9	
Madrid	Year 1924		40	
Malaga	Nov. 23–Jan. 3		97	
Do	Jan. 4–Mar. 14		81	
Valencia	Nov. 30–Dec. 6	2		
Do	Feb. 15–Mar. 7	3		
Switzerland:				
Lucerne	Nov. 1–Dec. 31	19		
Do	Jan. 1–31	24		
Syria:				
Aleppo	Nov. 23–Dec. 27	13		
Do	Jan. 4–Feb. 28	71	18	
Damascus	Jan. 6–13	2		
Tripoli:				
Tripoli	July 14–Dec. 12	52		
Tunis:				
Tunis	Nov. 25–Dec. 29	42	35	
Do	Jan. 1–Mar. 18		227	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from December 27, 1924, to April 10, 1925—Continued

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Turkey:				
Constantinople	Dec. 13-19	5		
Union of South Africa				Nov. 1-Dec. 31, 1924: Cases, 14.
Cape Province	Feb. 1-7			Outbreaks.
De Aar District	Jan. 25-31			Outbreak at railway camp.
Do	Nov. 9-Jan. 17			Outbreaks.
Orange Free State	Nov. 2-8			Do.
Ladybrand District	Jan. 15-31			Outbreak, on farm.
Transvaal	Nov. 9-Jan. 10			Do.
Do	Feb. 1-7			Outbreaks.
Uruguay				January-June, 1924: Cases, 101; deaths, 2.
Do				July-October, 1924: Cases, 45; deaths, 4.
On vessel:				
S. S. Eldridge	Mar. 23	1		At Port Townsend, from Yokohama and ports.
S. S. Habana	Feb. 18	1		At Santiago de Cuba, from Kingston, Jamaica.
S. S. Ruyth				At St. Malo, France, Jan., 1924, from Sfax, Tunis; believed to have imported smallpox infection.

TYPHUS FEVER

Algeria				July 1-Dec. 20, 1924; Cases, 101; deaths, 14.
Algiers	Nov. 1-Dec. 31	5	1	
Do	Jan. 1-Feb. 28	8	4	
Argentina:				
Rosario	Jan. 1-31		1	
Bolivia:				
La Paz	Nov. 1-Dec. 31	3		
Do	Jan. 1-31	2		
Bulgaria				January-June, 1924: Cases, 191; deaths, 28.
Do				July-October, 1924: Cases, 5.
Chile:				
Concepcion	Nov. 25-Dec. 1		1	
Do	Jan. 6-12		2	
Do	Jan. 27-Feb. 2		1	
Iquique	Nov. 25-Dec. 1		2	
Do	Feb. 1-7		1	
Talcahuano	Nov. 16-Dec. 20		5	
Do	Jan. 4-10		1	
Valparaiso	Nov. 25-Dec. 7		4	
Do	Jan. 11-Feb. 21		10	
Chosen:				
Seoul	Nov. 1-30	1	1	
Czechoslovakia				December, 1924: Cases, 5.
Egypt:				
Alexandria	Dec. 3-9	1	1	
Cairo	Oct. 1-Dec. 23	13	8	
Esthonia				Dec. 1-31, 1924: Cases, 5.
France				July-October, 1924: Cases, 7.
Gold Coast				Oct. 1-31, 1924: 1 case.
Greece				May-June, 1924: Cases, 116; deaths, 8.
Do				July-December, 1924: Cases, 40; deaths, 4.
Saloniki	Nov. 17-Dec. 15	3	2	
Do	Jan. 25-31	1		
Japan				Aug. 1-Nov. 15, 1924: Cases, 2.
Latvia				October-December, 1924: Cases, 30.
Lithuania				August-October, 1924: Cases, 15; deaths, 1.
Do				Jan. 1-31, 1925: Cases, 27; deaths, 2.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

Reports Received from December 27, 1924, to April 10, 1925—Continued

TYPHUS FEVER—Continued

Place	Date	Cases	Deaths	Remarks
Mexico:				
Durango	Dec. 1-31		1	
Guadalajara	Dec. 23-29		1	
Mexico City	Nov. 9-Jan. 3	80		Including municipalities in Federal District.
Do	Jan. 11-Feb. 14	40		Do.
San Luis Potosi	Mar. 8-14		1	
Morocco				November, 1924: Cases, 5.
Palestine				Nov. 12-Dec. 8, 1924: Cases, 7.
Ekron	Dec. 23-29	1		
Jerusalem	do	2		
Do	Jan. 20-26	1		
Mikveh Israel	do	1		
Ramleh	Feb. 10-16	1		
Tiberias	Feb. 24-Mar. 2	2		
Peru:				
Arequipa	Nov. 24-30		1	
Poland				Sept. 28, 1924-Jan. 3, 1925: Cases, 751; deaths, 57.
Portugal:				
Lisbon	Dec. 29-Jan. 4		2	
Oporto	Jan. 4-Feb. 7	2		
Rumania				January-June, 1924: Cases, 2,906; deaths, 328.
Do				July-August, 1924: Cases, 89; deaths, 12.
Constanza	Dec. 1-10	1		
Do	Feb. 1-28	2		
Russia				Jan. 1-June 30, 1924: Cases, 92,000. July-September, 1924: Cases, 5,225.
Leningrad	June 29-Nov. 22	12		
Spain:				
Madrid	Year 1924		3	
Malaga	Dec. 21-27		1	
Sweden:				
Goteborg	Jan. 18-24	1		
Tunis				July 1-Dec. 20, 1924: Cases, 40.
Tunis	Mar. 5-11	1		
Turkey:				
Constantinople	Nov. 15-Dec. 19	6	1	
Do	Jan. 2-Feb. 28	8	1	
Union of South Africa				Nov. 1-Dec. 31, 1924: Cases, 345; deaths, 87.
Cape Province	Nov. 1-Dec. 31	126	24	
Do	Feb. 1-7			Outbreaks.
East London	Nov. 16-22	1		
Do	Jan. 18-24	1		
Natal	Nov. 1-Dec. 31	130	50	
Do	Jan. 18-24			Do.
Orange Free State	Nov. 1-Dec. 31	59	8	Jan. 11-17: Outbreaks.
Transvaal	do	30	5	
Yugoslavia				Aug. 3-Oct. 18, 1924: Cases, 17; deaths, 2.
Belgrade	Nov. 24-Dec. 28	5		

YELLOW FEVER

Gold Coast	October-November, 1924.	4	4	
Salvador:				
San Salvador	June-October, 1924	77	28	Last case, Oct. 22, 1924.