PUBLIC HEALTH REPORTS

VOL. XXVI JANUARY 27, 1911 No. 4

REPORT ON AN OUTBREAK OF TYPHOID FEVER AT DES MOINES, IOWA, IN 1910

By L. L. LUMSDEN, Passed Assistant Surgeon, United States Public Health and Marine-Hospital Service

The investigation of the recent typhoid fever outbreak at Des Moines, Iowa, was made in compliance with a request to the Surgeon General of the Public Health and Marine-Hospital Service from the secretary of the Iowa State Board of Health.

The investigation was begun on December 22, 1910, and completed on January 7, 1911. It comprised a sanitary survey of the Raccoon River from Valley Junction to the filter galleries from which the water supply of Des Moines is obtained, bacteriological examinations of the water supply, an epidemiological study of about 50 individual cases of the disease, a review of the epidemiological data previously collected by the city health office, a study of the death records at the State health office, an inspection of a number of places such as dairies, grocery stores, and ice-cream manufactories, where foods are sold or prepared for sale, a careful inquiry into the origin and distribution of fruits, vegetables, and shellfish sold in the city during the period in which the outbreak was caused, a clinical study of a number of cases of the disease, a survey of the general sanitary conditions of the city, and a consideration of all other conditions which appeared to be likely to throw any light on the situation.

TIME OF OCCURRENCE AND EXTENT OF OUTBREAK

As there is no law requiring a report of cases of typhoid fever in Des Moines, the records of deaths (supposed to be complete since 1905) give the only figures available from which the prevalence of the disease in recent years can be estimated. The following table and chart (No. 1), based on compilations from the records at the office of the State Board of Health, show the number of deaths reported from typhoid fever in Des Moines by months since January, 1905.

Months	1905	1906	1907	1908	1909	1910	Total
January	1	2	.....	.....	2	1	6
February	1	2	.....	1	2	.....	6
March	1	2	1	1	.....	.....	5
April	.....	.....	1	.....	.....	1	2
May	.....	.....	2	2	2	.....	6
June	1	.....	3	1	.....	.....	5
July	2	2	4	1	.....	1	10
August	2	1	3	4	2	2	14
September	2	1	3	1	2	4	13
October	2	2	3	2	1	1	11
November	2	.....	2	2	2	2	10
December	.....	1	3	1	2	16	23
Total	14	13	25	16	15	28	111

It is evident that the number of deaths in December, 1910, was unusually high. Most of the deaths occurring in December were of persons who were taken sick in the latter part of November and in the early part of December.

Between November 25 and December 31, 1910, 209 cases were reported to the city health office. So far as can be ascertained the vast majority of these cases developed definite symptoms (took to bed) between November 15 and December 10. That this period of 25 days represents the time of occurrence of the outbreak proper is indicated by the results of (1) an investigation conducted by the city health officer, in which the dates of onset of 106 cases were carefully collected, and (2) an investigation conducted by the writer, in which the dates of onset of 50 cases reported during the outbreak were determined. The rate of admission of cases to the two largest hospitals of the city also points to this period as the time of occurrence of the outbreak. The time of admission of cases to hospital probably averaged about 5 days subsequent to dates of definite onset of illness. The rates of admission of cases to the Methodist and Mercy hospitals were as follows:

Date of admission	Number of cases		
	Methodist Hospital	Mercy Hospital	Total
Oct. 1 to 14	.....	.....	.....
Oct. 14	1	.....	1
Oct. 15 to 28	.....	.....	.....
Oct. 28	.....	1	1
Oct. 29 to Nov. 15	.....	.....	.....
Nov. 15	1	.....	1
Nov. 16 to 22	.....	.....	.....
Nov. 22	1	1	2
Nov. 23	1	2	3
Nov. 24	.....	2	2
Nov. 25	6	4	10
Nov. 26	1	2	3
Nov. 27	3	5	8
Nov. 28	3	1	4
Nov. 29	3	3	6
Nov. 30	4	.....	4
Dec. 1	3	.....	3
Dec. 2	2	1	3
Dec. 3	3	.....	3
Dec. 4	3	.....	3
Dec. 5	1	.....	1
Dec. 6	2	.....	2
Dec. 7	.....	.....	.....
Dec. 8	.....	1	1
Dec. 9	1	.....	1
Dec. 10	.....	.....	.....

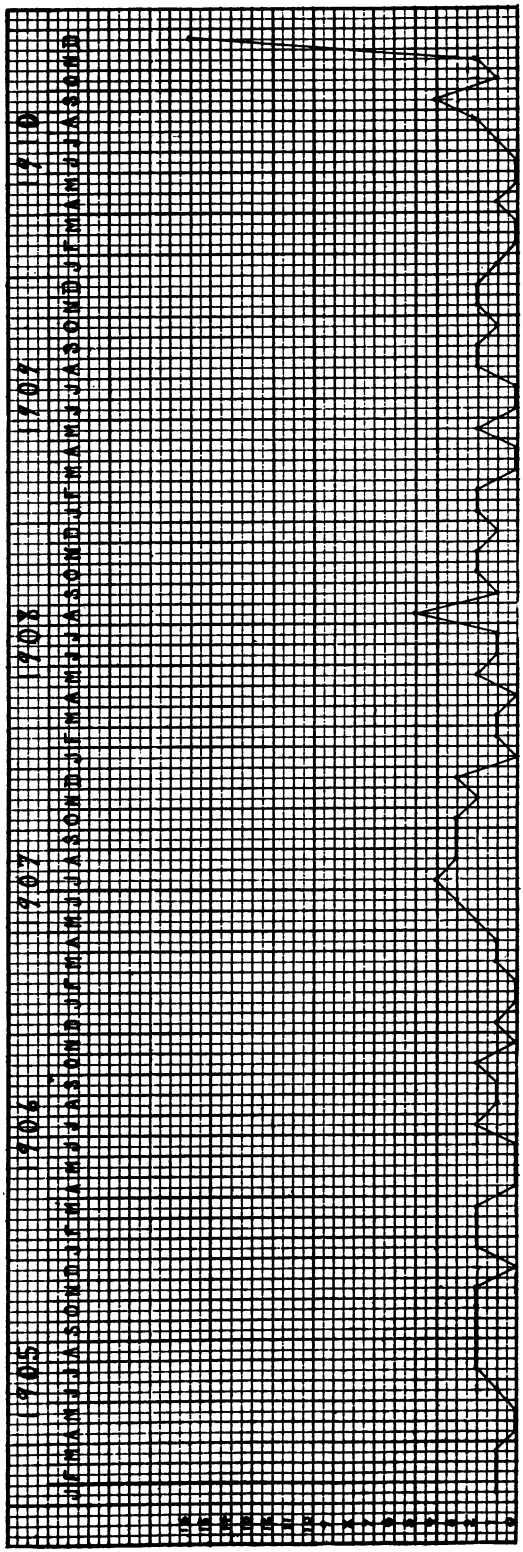


CHART No. 1.—Deaths from Typhoid Fever, by Months, from 1905 to 1911.

Date of admission.	Number of cases.		
	Methodist Hospital.	Mercy Hospital.	Total.
Dec. 11	1		1
Dec. 12	1	1	2
Dec. 13			
Dec. 14	1	1	2
Dec. 15	1	1	2
Dec. 16	2		2
Dec. 17		1	1
Dec. 18		1	1
Dec. 19			
Dec. 20	1		1
Dec. 21			
Dec. 22			
Dec. 23			
Dec. 24			
Dec. 25			
Total	46	28	74

The time of high admission rate was from November 22 to December 7. The number of cases admitted to the two hospitals in this period was 57, while from October 1 to November 22 only 3 cases were admitted, and from December 7 to December 25 only 14 cases. The dates of onset of illness in the 50 cases which the writer investigated personally are shown in chart No. 2. The dates of onset, as given in this chart, were determined certainly with reasonably sufficient exactness and probably represent fairly accurately the rate of occurrence of all the cases developing during the outbreak.

From all the facts ascertained it seems certain that the outbreak began sharply about November 17, reached its maximum about November 24, and continued high, but at a gradually declining rate, until about December 7. Therefore, accepting 12 days as the usual incubation period of the disease in instances of sudden and extensive outbreaks, it appears that the chief cause of the outbreak became operative about November 5, reached its maximum about November 12, and continued until about November 25, when it either ceased entirely to operate or continued to operate, but at a markedly diminished rate.

The exact number of cases which occurred in the outbreak is not known. Inability to secure a report of cases which could be regarded as reasonably complete was a great handicap in the investigation. The lack of law requiring the reporting of cases of typhoid fever in Iowa and the existence of statutes which prohibit municipalities in the State from enacting ordinances requiring the reporting of local cases constitute a condition urgently needing immediate correction

Without legal enactment a prompt report of cases can not be reasonably expected and outbreaks may occur without the health authorities learning of them in time to have even a possible chance to apply preventive measures. The recent outbreak in Des Moines, it seems, was first brought to the attention of the authorities by publications in the local newspapers 10 or 15 days after the outbreak had begun. It is fortunate that the outbreak was learned of even at that early period, and the local press is to be congratulated for its vigilance.

Other communities in Iowa are liable at any time to be visited by outbreaks, and in some of these communities there may be no local press or one not so vigilant as that of the capital city.

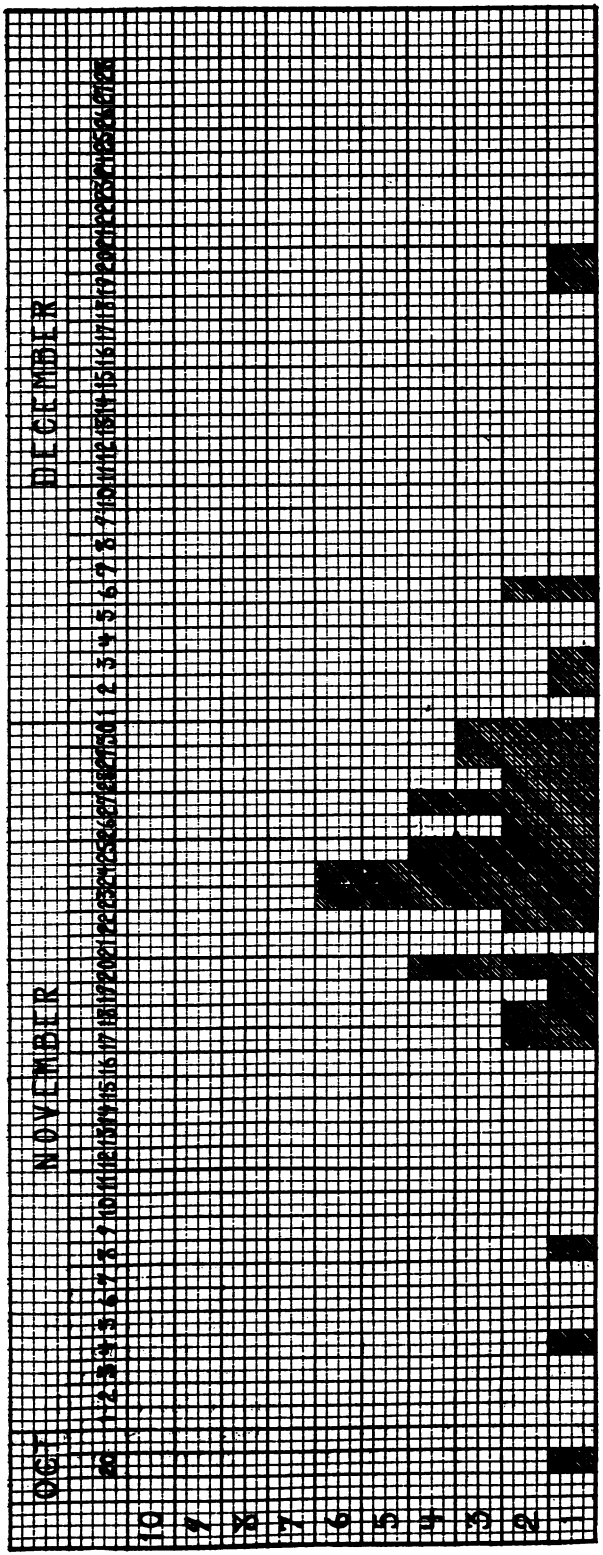


CHART No. 2.—Dates of Onset of 50 Cases Specially Investigated.

Between November 29 and December 31, 209 cases were reported to the city health office. That this number does not comprise all the cases that occurred is certain, and how many more did occur can only be estimated.

In the course of the investigation of 40 reported cases between December 27 and December 31, 5 cases were found which had not been reported. Of these 5 cases, 2 were in homes from which a previous case had been reported, and 3 were in homes from which a previous case had not been reported. Thus, if 5 cases which had not been reported were found by inquiring at about 40 homes it is reasonable to believe that quite a large number of cases which had not been reported could have been found if all the homes in the city had been canvassed.

At a meeting of the Polk County Medical Society on the evening of December 23 several physicians stated that they had not reported all of their cases. Thereupon the writer requested that all the physicians send to the city health office a complete report of all cases which they had treated since November 1, giving name, address, and onset of illness of each patient, the list to include all cases whether previously reported or not. A motion for compliance with this request was put to the society and carried without a dissenting vote, but such report as was requested was received from only one physician.

There were very probably some cases which were not attended by a physician and which were not reported.

In view of all the facts and on a basis of strong probability the number of cases which occurred between November 15 and December 31 is estimat d at about 300. Of these 300 cases probably about 250 occurred in the period from November 17 to December 7, that is, when the outbreak was at its height, and resulted from the operation of the chief cause of the outbreak. On this estimate one person in about every 290 in the city's population was affected. That the infection was widely and synchronously distributed over the city is beyond question.

DIAGNOSIS

Among the many positively or negatively helpful suggestions received from various sources in the course of the investigation one was that on account of the popular excitement many cases had been reported as typhoid fever under mistaken diagnoses. Judging from the histories obtained in about 80 cases and from clinical inspection of about 30 cases, the writer is convinced that over 90 per cent of the cases reported as typhoid fever were correctly diagnosed as such.

EPIDEMIOLOGICAL INVESTIGATION OF CASES

When an extensive and explosive outbreak of typhoid fever occurs in the cold winter season in a city having a generally distributed public water supply, suspicion usually falls first upon the water supply as the source of the infection. As the water has been used for drinking purposes by most of the people in the community it has to be considered certainly as a possible common factor in the causation of the outbreak. But just because the water is used by most of the people it is difficult to either eliminate or definitely involve it as the source of the infection, and although in such instances extraordinary

precautions should be taken at once to safeguard against the possible spread of infection by the water supply, final decision should not be rendered until after a thorough investigation has been made of the water supply and of the other possible sources of infection. To determine the possible sources of infection a careful epidemiological study of cases is necessary in order to ascertain to what conditions the persons affected were exposed prior to illness. As the facts are collected and studied one suspected source after another may be eliminated until the true principal source or sources of the infection can be determined, as a rule, with reasonable certainty.

Before the beginning of this investigation of the situation in Des Moines epidemiological data in regard to 106 cases reported after the beginning of the outbreak had been collected under the direction of the city physician, Dr. H. L. Sayler. From certain quarters some doubt as to the accuracy of these data was expressed on the ground that the canvass had been made hastily and by college students inexperienced in epidemiological work. For this reason, and also in order to collect data regarding certain conditions not covered by the canvass of the 106 cases, the writer personally investigated 51 cases. In the investigation of these 51 cases the homes of the patients were visited and a careful inquiry was made to ascertain all the facts called for by the following blank form:

TYPHOID FEVER CASE CARD

Case No. —.
Name ———. Age ———. Sex ———. Nationality ———.
Date of first symptoms ———. Date took to bed ———.
Date of death ———. Date of recovery ———.'
Widal reaction positive or negative ———.
Rose spots ———. Intestinal hemorrhages ———.
Previous attack of typhoid ———. When ———.
Residence when taken sick ———, from ——— to ———.
Previous residence ———, from ——— to ———.
Subsequent residence ———, from ——— to ———.
Character of residence ———. Sewage disposal ———.
Water-closet in house ———. Water-closet in yard ———. Privy vault ———.
Conditions of sanitary devices ———. Relation of privy to well ———.
General sanitary conditions of residence:
Good ———. Fairly good ———. Rather bad ———. Bad ———.
Previous cases of typhoid in house ———.
Previous cases of typhoid in neighborhood ———.
Occupation ———. Where ———, from ——— to ———.
Water used at place of employment:
Solely ———. Principally ———. Occasionally ———.
Was patient away from Des Moines within 30 days prior to illness ———.
Where ———, from ——— to ———.
Exposed to known infection while away ———.
Water for drinking 30 days prior to illness:
Solely ———. Principally ———. Occasionally ———.
Soda water ———. Where ———.
Source of ice ———. How used ———.
Meals, where taken ———. Milk, how used ———.
Beverage ———. In cereals ———. In coffee or tea only ———.
Source of milk ———. Usually ———. Occasionally ———.
Milk used, boiled or pasteurized ———. Ice cream ———. Source ———.
Celery ———, lettuce ———, radishes ———, raw shell fish ———, apples ———.
Contact:
Association with patients in febrile stage.
Association with suspected cases.
Association with convalescents.
Association with persons who were in contact with patients.

Prophylaxis:
Are stools disinfected ———. How ———.
How disposed of ———. Is urine disinfected ———. How ———.
How disposed of ———.
Other precautions:
Efficient ———. Fairly efficient ———. Inefficient ———.
Name and address of attending physician ———.
Summary ———.
Date of investigation.

———— ————,
Investigator.

Of the 51 cases investigated by Dr. Sayler and the writer, 43 had been covered in the previous canvass conducted under Dr. Sayler's direction, and the findings in the two separate investigations of these 43 cases were found to be in substantial agreement. That the findings of one investigation checked in salient features with the findings of the other is, of course, an indication of the accuracy of the findings in both investigations.

The 51 cases investigated were reported after the beginning of the outbreak. They were from among persons living in widely separated parts of the city and in all ways were selected so that they could be considered fairly representative of all the cases which occurred during the outbreak. The data collected in the investigation of these 51 cases, therefore, may be considered to indicate sufficiently accurately what would have been found generally true for all the cases occurring during the outbreak.

The findings and interpretations of the findings in these 51 cases were as follows:

IMPORTED CASES

One of the cases was in a person who came to the city after onset of illness and who undoubtedly contracted the infection elsewhere. Another was in a person who had been away from the city about half of the time during the 30 days prior to illness and whose chances of contracting the infection in or away from the city were about equal. Three others were in persons who had been away from the city for a day or two or less during the 30 days prior to illness and whose chances of contracting the infection while away were estimated at about 10 per cent. All of the remaining cases (46) were in persons who had not been away from the city within the 30 days prior to onset of illness. From these findings it appears that in less than 2 per cent of the cases occurring during the outbreak was the infection contracted away from Des Moines.

AGE AND SEX

For the 50 cases investigated and considered of local origin, the age and sex of the persons affected were as follows:

Age, in years	Number of cases		
	Male	Female	Total
0 to 4		4	4
5 to 9	1	5	6
10 to 14	3	9	12
15 to 19	5	5	10
20 to 24	1	9	10
25 to 29	2	2	4
30 to 34			
35 to 39	1	1	2
40 to 44		1	1
45 to 49		1	1
Total	13	37	50

In extensive outbreaks caused by milk-borne infection the proportion of cases in children under 10 usually is considerably larger than was that found among the cases in the Des Moines outbreak, as shown by the following table:

Age, in years	Percentage of typhoid cases at specified age			
	Waterville, Me., 1903, caused by water	Stamford, Conn., 1895, caused by milk	Des Moines, 1910	
			Sayler's 98 cases	Lumsden's 50 cases
0 to 10	17	35	14	20
10 to 20	38	24	45	44
20 to 30	26	23	24	28
30 to 40	10	12	11	4
40 to 50	4	5	5	4
50 to 70	5	1	1	0
Total	100	100	100	100

It appears that in the Des Moines outbreak the age distribution of cases more nearly approached that usual in outbreaks due to water than that in outbreaks due to milk-borne infection.

OCCUPATION

The following table gives the occupations of the persons affected:

Occupations	Male	Female	Total
School children	8	18	26
Watchmakers	1		1
Housewives		3	3
Telegraph-instrument fixers	1		1
Telephone-office clerks		2	2
Students (university)		2	2
Bookkeepers		1	1
Ice-wagon drivers	1		1
Salesmen and saleswomen		1	1
Seamstresses		1	1
Cashiers (store)	1		1
Waiters and waitresses (restaurant)		1	1
Firemen (city)	1		1
Newspaper-advertising solicitors		1	1
Laundresses		1	1
Milliners		1	1
No occupation		5	5
Total	13	37	50

It is evident that the disease was distributed through the population regardless of occupations in which persons were engaged.

CHARACTER AND GENERAL SANITARY CONDITION OF RESIDENCES

Four of the cases were in persons living in rooming houses, 3 among persons in apartment houses, 4 among persons in public institutions (boarding schools), and the remaining 39 were among persons who lived at private residences. The disease certainly did not appear to prevail at a disproportionately high rate among persons who would be most closely associated with transient visitors to the city.

Twenty-three of the cases occurred at residences where the general sanitary conditions were good, 20 at residences where the general sanitary conditions were fairly good, and 7 at residences where the general sanitary conditions were rather bad. From these findings it appears that the disease did not prevail disproportionately among persons living in insanitary neighborhoods and, therefore, that in the causation of the outbreak faulty sanitary conditions at place of residence of persons affected did not constitute an important factor.

SEWAGE DISPOSAL

Thirty-three of the cases occurred at residences connected with the city sewerage system and at which water-closets were used, and 17 at residences not connected with the city sewerage system and at which privy vaults or surface privies were used. No instance was met with in which it appeared likely that faulty plumbing or seepage from privy to well could have been responsible for the infection.

FOODS AND BEVERAGES

The season of occurrence, the geographical distribution, and the general features of the outbreak taken together definitely eliminated flies and other insects and contact infection as major factors in the

causation of the outbreak, and from the outset it seemed on general principles, drawn from present knowledge of the modes of spread of typhoid fever, that the outbreak had been caused by infection in some beverage or foods which had been widely distributed over the city. Therefore, in the epidemiological investigation of cases it was endeavored to ascertain as nearly exactly as possible just what foods and beverages, liable to convey infection, had been used by the persons affected, in order to determine which foods and beverages could be eliminated and which involved as the principal source of infection.

MEALS—WHERE TAKEN

Of the 50 cases, 45 were in persons who had taken meals within the 30 days prior to illness at their places of residence only, 3 in persons who had taken meals at their places of residence usually, but at restaurants occasionally, and 2 in persons who had taken meals usually at restaurants and boarding houses.

From these data it is certain that the outbreak was not caused by infection introduced into foods and beverages at public eating places.

MILK

In cities where large milk dealers distribute their supplies over large territories extensive and widespread outbreaks of typhoid fever may be caused by milk-borne infection. Outbreaks caused by milk occur most frequently in the summer and early fall, but as milk is a favorable culture medium for the typhoid germs such outbreaks may occur at any season of the year. The likelihood of milk being the source of the infection causing the Des Moines outbreak, therefore was given particular consideration.

The 50 cases investigated gave the following history as to the way in which milk was used during the 30 days prior to illness:

As a beverage	16
In fruits or cereals, but not as a beverage	15
In hot tea or coffee only	14
As ice cream only	2
Not in any way	3

The proportion of cases giving a history of having used milk as a beverage is one point in the evidence that the outbreak was not due to milk, as in outbreaks due to milk the proportion of cases among milk drinkers is usually considerably larger.

There was no disproportionately large number of cases among the customers of any dairyman. Of the 50 cases specially investigated 2 used milk from their own cows only, 3 used no milk in any way, and the remaining 45 cases were distributed among the customers of 25 different dairymen. The source not only of the milk used habitually, but also of that used occasionally (as from grocery stores, for instance), was ascertained as completely as possible for each case. Sixteen of the cases gave a history of having used habitually or occasionally milk sold by the largest dealer in the city and 8 of having used milk sold by the second largest dealer in the city. These two dealers sell about 50 per cent of the milk distributed in Des Moines, so that the number of cases among their customers was entirely proportionate to their business. Groups of cases in widely separated

parts of the city occurred synchronously and absolutely disconnected in respect to the source of milk used prior to illness.

Two or more cases developing at about the same time in the same household is of frequent occurrence in milk outbreaks, but this was of very infrequent occurrence in the Des Moines outbreak. In outbreaks due to milk a considerable proportion of cases, particularly in children, will have a sudden onset of illness without prodromal symptoms, while over 90 per cent of the cases in the Des Moines outbreak gave a history of prodromes.

In view of all these facts the milk supply can be eliminated, beyond reasonable doubt, as the chief and primary source of the infection which caused the recent outbreak in Des Moines. If milk operated as a factor it must have done so in a secondary way, the bottles or cans becoming infected by being exposed in some way to germs which had already been distributed through some other medium.

ICE CREAM

Fifteen of the cases were in persons who had eaten ice cream within the 30 days prior to illness, 30 cases gave a history of not having eaten ice cream, and for 5 accurate information regarding the eating of ice cream was not obtainable. The 15 cases giving a history of having eaten ice cream were among the customers of several different ice-cream makers. Evidently ice cream can be eliminated as a considerable factor in the production of the outbreak.

RAW SHELLFISH

Only 1 case out of the 50 gave a history of having eaten raw oysters or clams within 30 days prior to illness, so that raw shellfish may be definitely eliminated.

SODA WATER

The history of the 50 cases in regard to the drinking of soda water within the 30 days prior to illness was as follows: Yes, 2; no, 44; not determined, 4. Soda water could not have been a considerable factor.

ICE

Two cases were in persons who had used ice in beverages, while 48 gave a definite history of not having done so. Ice can be eliminated as a considerable factor.

RAW VEGETABLES AND FRUITS

Most persons will give a history of having eaten some kind of raw fruits or vegetables within any period of 30 days, so as a rule these products can not be definitely excluded on the history of the cases alone as possible sources of infection. Yet when the history of the cases in respect to the eating of the different fruits and vegetables is considered along with the general features of the outbreak and the likelihood of any particular supply of possibly infected fruits or vegetables having been distributed so as to have reached the persons

affected, reasonably definite conclusions may be formed. The history of the cases in regard to the eating of vegetables and fruits within the 30 days prior to onset of illness was as follows:

Fruit or vegetable	Yes	No	Not definitely determined	Total
Celery	18	31	1	50
Lettuce	6	42	2	50
Radishes	1	48	1	50
Apples	29	5	16	50

Thus, the history of the cases alone is sufficient to exclude all of these except apples as having been a possibly major factor in the causation of the outbreak. From what is known about the viability of the typhoid bacillus and the way in which apples are gathered and subsequently handled it would certainly seem highly improbable that apples could have been responsible for such an outbreak as the recent one in Des Moines, even if every case had given a definite history of having eaten apples. Furthermore, it was found that the apples eaten by the persons affected had been distributed from the storehouses of at least three of the large wholesale dealers in the city, and it is contrary to the laws of probability that each of these dealers, obtaining his supply of apples from different sources, would have been selling highly infected apples in November, 1910. In view of all the evidence, fruits and vegetables may be eliminated, beyond reasonable doubt, as having played a very considerable part in the causation of the outbreak.

CONTACT

Only two of the cases gave a history of free association with previous cases in the febrile stage of the disease and were attributable to infection by contact. These two cases had onsets of illness on December 19 and December 20, respectively, and had lived in the same house with and helped nurse a case whose onset of illness was November 22. A considerable proportion of the cases occurring since the 10th of December probably would be found to be attributable to contact infection; but all the evidence indicates that in the outbreak, contact operated only as a factor secondary to some other, which was chief and primary.

WATER

Of the 50 cases, 49 gave a history of having used the city water unboiled as the sole or principal source of drinking water during the 30 days prior to illness. The one case giving a history of not having used any city water not previously boiled was one of the cases attributed to contact infection and referred to above.

Of the 49 cases, 41 had used the city water solely, while 8 had used the city water principally, but water from some other sources, such as wells, occasionally. Thus the city water presents itself as a common factor, and certainly as a possible chief source, of the infection which caused the outbreak. Along with this fact the season of occurrence, the extent and the explosive character of the outbreak,

the distribution of the disease in relation to the distribution of the water supply, and the exposure of the water supply to dangerous pollution constitute a very strong chain of evidence that the city water was the source of the infection which caused the outbreak.

POLLUTION OF THE WATER SUPPLY

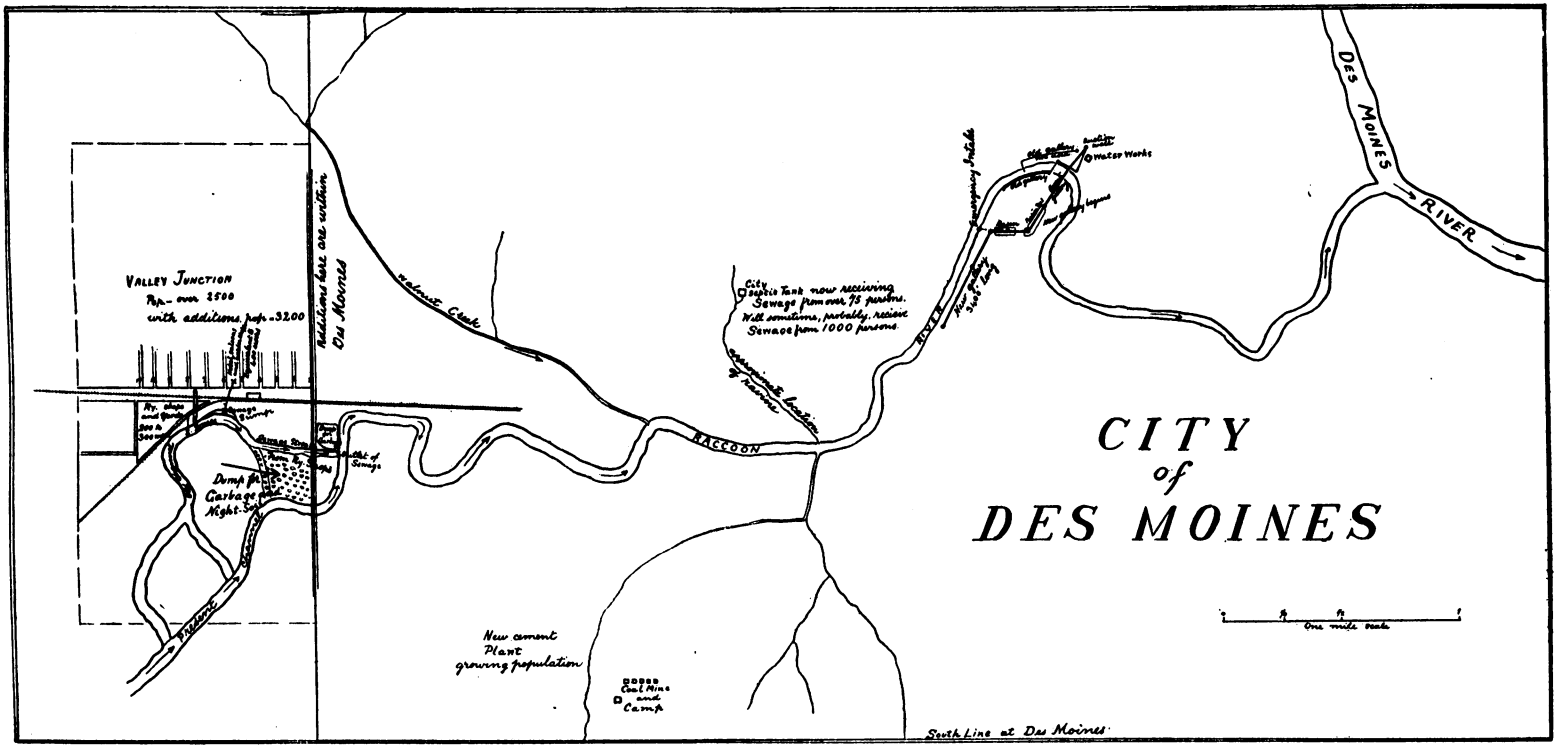
As the water from a new gallery was turned into the city supply at about the same time as the outbreak occurred, and as it had been observed that proper sanitary arrangements were not provided for the men engaged in the work while the construction of this gallery was going on, it was assumed by many people in the community that the outbreak had been caused by infection in the water from the new gallery.

The officials of the Des Moines Water Co. state that none of the water from the new gallery could have entered the city supply before November 15, and that little if any water from the new basins could have entered the city supply before November 30, when the gate of the new gallery was opened and the water taken from the river and filtered through the new sand basins first entered the city supply. According to this information the water from the new gallery, although possibly contributing somewhat, could not have been the sole source of the infection which caused the outbreak, since the period of causation of the main outbreak, as determined by onset of cases, was from about November 5 or 10 to about November 25 or 30.

According to further information received from the water company the scraping away of the surface sand over the two filtration galleries crossing the river, which had been done from time to time throughout the summer and fall in order to secure more rapid filtration of the water from the river into these galleries, was done to a greater extent in the week ended November 5 than in any other week of the year. The next largest amount of scraping for any one week was in the week ended November 12, and the last scraping of the sand over the river galleries was done on November 26. Beginning on November 10 and continuing for some time thereafter a centrifugal pump was operated on the water in the river galleries. This pumping was for the purpose of producing a negative pressure in the galleries, so that the filtration of the river water through the sand over the galleries crossing the river would be more rapid. The time of the unusual amount of scraping of the sand over the river galleries, and the work of the centrifugal pump on these galleries in relation to the period of causation of the outbreak is very suggestive of cause and effect.

According to the description of the work as given by the water company it would seem that there was ample opportunity for dangerous pollution to enter the city water supply during the period extending from November 5 to November 26, provided there was dangerous pollution in the water of Raccoon River as it flowed over the galleries at that time.

As to the dangerous pollution of the Raccoon River at points within a few miles above the location of the galleries there is no question whatever. The attached map, prepared by Prof. Lafayette Higgins, engineer of the Iowa State Board of Health, and based on observa-



Map of Raccoon River showing pollution of river between Valley Junction and location of filtration galleries from which water supply of Des Moines is obtained.

tions made conjointly by Prof. Higgins and the writer, will give some idea of the pollution of the Raccoon River with human excrement at Valley Junction and at points between Valley Junction and the location of the galleries from which the water supply of Des Moines is obtained. Considering the amount of pollution which enters the river, there is no room for doubt that typhoid infection may more or less continuously reach the water of the river below Valley Junction and above (upstream from) the Des Moines filter galleries.

According to information received from the physicians of Valley Junction there were cases of typhoid fever under treatment in Valley Junction in October and November, 1910. The occurrence of cases as given was as follows: In September, 3; October, 4; November, 5; and in December, 1.

BACTERIOLOGICAL EXAMINATIONS OF THE DES MOINES CITY WATER SUPPLY

Since this investigation was not begun until December 22, the bacteriological study of the water could not be expected to throw any very definite light on what was the condition of the water when the outbreak was caused. Therefore the bacteriological examinations were made with a view principally to determining if the filtration of the water under what may be called "normal" conditions of filtration could be relied upon entirely to remove from the river water and from the "ground" water obtained from the river basin such disease-producing microorganisms as might be present in the water. Bacteriological examinations were not made of the river water above the filter galleries because they were not considered necessary, the sanitary survey of the river from Valley Junction down showing more unmistakably than bacteriological examinations could that the river is dangerously polluted with human excrement.

Efforts were not made to recover typhoid bacilli from the water for the following reasons:

1. Negative findings at this time would have been no indication of conditions at the time the outbreak was caused.

2. From waters containing typhoid bacilli in sufficient numbers to cause a very high rate of prevalence of typhoid fever among persons using such waters the isolation of the organisms is, by present bacteriological technique, very diffcult and largely a matter of chance. Only a few ounces of water a day can be properly examined for the presence of the typhoid bacillus and though none of the organisms might be found in the few ounces examined, quite a number might be at the same time present in the hundreds of gallons of water drunk by the people in the community supplied; therefore, in a search for typhoid bacilli under such circumstances negative findings can be expected and such negative findings throw no light whatever on the situation.

Samples of water from the following sources were examined:

1. Siphon well, this sample representing the mixture of effluents from all the filtration galleries.

2. Pumping station, this sample representing the water just before it is pumped into the mains for distribution to the city.

3. Tap at the laboratory building, at Fourth and Center Streets; and

4. Tap at the city hall; the last two representing the water after it has traversed the city mains.

The dates and results of the examinations are presented in the following table:

Source of sample	Date of examination (planting)	Number of bacteria on agar plates from 1 cc. after 48 hours incubation at 37° C	Number of red colonies on lactose litmus agar plates from 1 cc	Fermentation with gas production after 48 hours in lactose bouillon				B. coli in—			
				1 cc	5 cc	10 cc	20 cc	1 cc	5 cc	10 cc	20 cc
Laboratory tap	Dec. 25, 1910	16	.....	+	.....	+	.....	+	.....	.....	.....
Siphon well	Dec. 26, 1910	16	.....	−	.....	+	.....	−	.....	−	.....
Pumping station	....do.....	14	1	−	.....	−	.....	−	.....	−	.....
Laboratory tap	....do.....	12	1	−	.....	+	.....	−	.....	+	.....
Do	Dec. 29, 1910	3	.....	−	.....	−	.....	−	.....	−	.....
City Hall tap	Dec. 31, 1910	2	.....	.....	−	.....	.....	.....	−	.....	.....
Laboratory tap	....do.....	1	.....	.....	−	.....	.....	.....	−	.....	.....
Do	Jan. 2, 1911	.....	.....	.....	.....	.....	−	.....	.....	.....	−

It should be noted that the bacterial counts were made from the number of colonies on agar plates incubated at 37° C, and not on gelatin plates incubated at 20° C, the medium and temperature usually employed in making bacterial counts of water. Gelatin plates will usually give somewhat higher counts than will agar plates. The laboratory was not equipped for the use of gelatin plates.

The proportion of samples of the city water taken prior to December 29 which gave fermentation in lactose-bouillon and which contained colon bacilli is significant. The presence of colon bacilli in the city water in such numbers indicates that even at that time the filtration of the water was not efficient to remove from the river water whatever dangerous pollution it might have contained. That the filtration was still less efficient in the early part of November, when the filtration was being forced, is certainly a reasonable deduction.

The improvement in the city water, as shown by the results of the examinations of samples taken on and after December 29 is striking. The three samples examined on and after that date gave average counts of two bacteria to the cubic centimeter, and none gave fermentation in lactose bouillon or other indication of the presence of the colon bacillus. The results of the examinations of these three samples compare favorably with those usually obtained from examinations of waters from deep wells of unquestionable safety. Should the water supply of the city of Des Moines be maintained constantly in the condition in which it was found to be at the time these last three samples were taken, it certainly would appear to be safe, so far as bacterial content is concerned, and to need no boiling previous to use.

CHEMICAL TREATMENT OF THE WATER SUPPLY

According to information received from officials of the water supply, chemicals were applied to the whole or a part of the city water supply from July 1 to December 25, 1910, on the following dates:

July 7 and 8, December 5, 7, 8, 14, and 15, and after 4.45 p. m. of December 26 the whole city supply was treated with hypochlorite

of lime. Therefore the improvement of the city water noted in the samples examined on and after December 29 may be attributed to the use of hypochlorite and not necessarily to any extent to more efficient filtration.

On the evening of December 26 the writer was apprised by a representative of the water company of the use of and the contemplated continued use of hypochlorite in the water, and therefore the difference in findings in the examinations of the water made subsequent to that date occasioned no surprise.

GEOGRAPHIC DISTRIBUTION OF THE OUTBREAK IN RELATION TO THE DISTRIBUTION OF THE WATER SUPPLY

So far as could be ascertained, the occurrence of cases in the outbreak was largely confined to persons living in districts supplied by the city water. Districts of the city, containing altogether probably about 10,000 to 15,000 of the city's population, not supplied with city water, but with water from wells, remained singularly free from the disease. Most of the cases learned of in these districts were found on investigation to be in persons who had used the city water on frequent occasions while on visits of a business or social nature to other parts of the city. Fort Des Moines, located 5 miles from the city, but supplied with water from the Des Moines supply, had 3 cases. These 3 cases had their onsets of illness as follows: Two on December 2 and 1 on December 19. The first 2 cases gave a history of not having eaten when on visits to the city any foods such as are considered likely to serve as media of typhoid infection. The last case to develop at Fort Des Moines gave a history of having drunk milk at restaurants in the city on several occasions within the two or three weeks prior to illness. The population of the fort is about 900, so that the disease evidently prevailed there during the outbreak at about the same rate as it did in the city. The distribution of the disease in relation to the city water supply is very significant.

CONCLUSIONS

1. The outbreak of typhoid fever in Des Moines in November and December, 1910, was caused, beyond reasonable doubt, by infection disseminated in the city water obtained from the Raccoon River and Raccoon River basin. A small proportion of the cases may have been caused by infection received immediately through personal contact, milk, vegetables, fruits, etc., but the vast majority of the cases resulted from infection distributed primarily and chiefly in the city water supply. This conclusion is based on the following points of evidence:

(*a*) The season of occurrence and the explosive character of the outbreak.

(*b*) The distribution of the disease in relation to the distribution of the city water.

(*c*) The pollution of the Raccoon River at points within a few miles upstream from the location of the filtration galleries.

(*d*) The results of the bacteriological examinations of the water, showing that even about a month after the scraping away of the

upper layer of sand from over the filtration galleries crossing under the river and the working of a centrifugal pump on these galleries, in order to secure rapid or forced filtration, had been discontinued, the filtration was still inefficient to remove from the water, to a reasonably reliable extent, such disease-producing microorganisms as the water in the river and the river basin may have contained.

(*e*) The correspondence in time between the period of special forcing of the filtration galleries and the period of main causation of the outbreak.

(*f*) The decline in the outbreak in due time, according to what is known about the viability of the typhoid bacillus in water and sand, after the forcing of the filtration had been discontinued and after the time in which the bulk of whatever infection may have reached the sand of the new basins, as a result of the lack of proper sanitary precautions while the work on these new basins was going on, probably would have elapsed.

(*g*) The results of the epidemiological studies of the cases, which implicate the city water supply and which definitely eliminate, except perhaps as secondary and minor factors, all other media which according to the whole history of the epidemiology of typhoid fever, could be reasonably considered to have served to convey infection causing an outbreak of such character.

2. The water supply as obtained from the filtration galleries is thoroughly susceptible to purification from whatever bacterial disease-producing organisms it may contain by the proper use of hypochlorite of lime; and when it is assured that the whole supply is being properly treated at all times with hypochlorite the water may be used, certainly with reasonable safety, for drinking and other domestic purposes without boiling previous to such use.

3. The milk supply and the general food supply of the city can be definitely eliminated as the chief and primary source of the infection which caused the recent outbreak, but it is readily conceivable, in view of the way in which much of the milk in the city is handled, that cans and bottles and consequently the milk itself were exposed to whatever infection was in the water or upon the hands of persons working in public dairies; and, therefore, milk may have operated to some extent as a secondary factor. Milk and other food supplies of the city, as handled at present, are liable at any time in the future to be important sources of infection and therefore should be made subject to official inspection as soon as practicable.

4. Most of the privy vaults and privies in the city are of very faulty construction and constitute a menace to the health of the city in respect not only to typhoid fever but to all other diseases caused by organisms disseminated from faultily disposed of human excrement. The danger from these faulty privies will be greatest during the summer weather when flies and other insects are abundant.

RECOMMENDATIONS

1. Safeguard the city's water supply.—To accomplish this the following measures are suggested:

(*a*) Protection of the Raccoon River on both sides from sewage pollution at points upstream from the location of the filtration

galleries as far as Valley Junction certainly and as much farther upstream as practicable. The Des Moines sewers could be extended to receive the sewage from Valley Junction, or the sewage from Valley Junction could be subjected to purification before being discharged into the river. The dumping of night soil from the privies of Valley Junction at places where it will be liable to seep or be washed into the river should be prohibited. Special attention should be given to surface drainage toward the river from privies at settlements located to the south (the right bank) of the river and within 5 or 6 miles up country from the filtration galleries.

(*b*) The abandonment as soon as practicable of the filtration galleries which cross under the river and their replacement with closed conduits, so that the whole water supply will be received from the sand basin to the south side (right bank) of the river.

(*c*) Until the above changes, *a* and *b*, have been effected and until the safety of the water as then delivered has been determined by prolonged and careful bacteriological and chemical studies conducted by competent and officially appointed investigators, the whole water supply should be treated constantly and under official supervision with hypochlorite of lime applied in accordance with methods approved by unbiased expert opinion.

(*d*) Until definitely and officially assured that the water has been made safe by the use of hypochlorite of lime, the people should be advised to boil the city water before using it for drinking purposes.

The enactment of an ordinance requiring that all water sold in the city of Des Moines shall be within certain chemical and bacteriological standards of purity is suggested.

2. Use every effort to secure legislation which will require the prompt reporting of all cases of typhoid fever in the State of Iowa. This is urgently and immediately important. Without such law outbreaks due to readily removable causes may go on in different communities for some time before being discovered, and so cause much needless and preventable suffering and loss of life.

3. Secure official inspection of dairies and dairy farms and of other places where public food supplies are sold or prepared for sale. The enactment of an ordinance requiring the pasteurization of milk and sterilization of all milk cans and bottles, under official supervision, is suggested.

4. Abolish all faulty privy vaults and surface privies and replace them with privies provided with water-tight vessels for receiving the excrement, and constructed so that flies and other insects will not have access to the excrement.

5. Have all cases of typhoid fever investigated and the precautionary measures to prevent spread of infection from the bedsides of patients officially supervised by the local health officer.

UNITED STATES

REPORTS TO THE SURGEON GENERAL, PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE

PLAGUE-PREVENTION WORK

INFECTED GROUND SQUIRREL

During the week ended January 7 the finding of 1 plague-infected ground squirrel was reported. The squirrel was found December 29, 1910, in Alameda County, Cal., at S. Jones ranch, 5 miles northeast of Haywards.

DISTRIBUTION OF POISON

In connection with the making of a squirrel-free zone around the cities in California on San Francisco Bay, 155 acres of land in Alameda County were covered with poison during the week ended January 7, 1911.

Record of Plague Infection.

Place	Date of last case of human plague	Date of last case of rat plague	Date of last case of squirrel plague	Total number of rodents found infected since May, 1907
California:				
Cities—				
San Francisco	Jan. 30, 1908	Oct. 23, 1908	None	398 rats.
Oakland	Oct. 26, 1909	Dec. 1, 1908	do	126 rats.
Berkeley	Aug. 28, 1907	None recorded	do	None.
Los Angeles	Aug. 11, 1908	None	Aug. 21, 1908	1 squirrel.
Counties—				
Alameda (exclusive of the city of Oakland).	Sept. 26, 1909	Wood rat, Oct. 17, 1909.	Dec. 29, 1910	88 squirrels. 1 wood rat.
Contra Costa	July 21, 1908	None	Sept. 10, 1910	247 squirrels.
Merced	None recorded	do	June 6, 1910	2 squirrels.
Monterey	do	do	do	4 squirrels.
San Benito	June 5, 1910	do	July 11, 1910	20 squirrels.
San Joaquin	None recorded	do	Nov. 15, 1910	9 squirrels.
San Luis Obispo	do	do	Jan. 29, 1910	1 squirrel.
Santa Clara	Aug. 23, 1910	do	Oct. 5, 1910	23 squirrels.
Santa Cruz	None recorded	do	May 17, 1910	3 squirrels.
Stanislaus	do	do	May 21, 1910	5 squirrels.
Washington:				
Seattle	Oct. 30, 1907	Feb. 8, 1910	None	22 rats.

Rats Collected and Examined for Plague Infection

Place	Week ended—	Found dead	Total collected	Examined	Found infected
California:					
Cities—					
Berkeley	Jan. 7	.....	[1] 73	37	.....
Oakland	...do....	49	[2] 548	391	.....
San Francisco	...do....	31	[3] 1,475	1,047	.....
Counties—					
Merced	...do....	.....	[4] 6	4	.....
Washington:					
Cities—					
Seattle	...do....	.....	781	681	.....
Total	.....	80	2,883	2,160	.....

[1] Identified, *Mus norvegicus* 39, *Mus musculus* 34.
[2] Identified, *Mus norvegicus* 440, *Mus musculus* 108.
[3] Identified, *Mus norvegicus* 822, *Mus rattus* 189, *Mus musculus* 348, *Mus alexandrinus* 116.
[4] Identified, *Mus norvegicus* 6.

Squirrels Collected and Examined for Plague Infection

Place	Week ended—	Trapped and shot	Found dead	Examined	Found infected
California:					
Cities—					
San Francisco	Jan. 7	1	.....	1	.....
Counties—					
Alameda	...do....	219	1	220	1
Los Angeles	...do....	76	.....	71	.....
Mariposa	...do....	55	.....	55	.....
Merced	...do....	221	.....	218	.....
Monterey	...do....	535	.....	532	.....
San Joaquin	...do....	200	2	202	.....
San Luis Obispo	...do....	171	.....	171	.....
San Mateo	...do....	33	.....	33	.....
Santa Clara	...do....	80	.....	80	.....
Stanislaus	...do....	122	.....	122	.....
Yolo	...do....	10	.....	10	.....
Total	.....	1,723	3	1,715	1

Other Animals Collected and Examined

Place	Week ended—	Animals collected	Examined	Found infected
California:				
Counties—				
Kern	Jan. 7	4 kangaroo rats; 4 chipmunks.	8	.....
Los Angeles	...do.....	4 kangaroo rats; 4 chipmunks; 1 weasel.	9	.....
Mariposa	...do.....	4 rabbits	4	.....
San Joaquin	...do.....	2 kangaroo rats; 2 rabbits; 1 gopher.	5	.....
San Mateo	...do.....	8 rabbits	8	.....
Santa Clara	...do.....	5 rabbits	5	.....
Stanislaus	...do.....	4 rabbits	4	.....
Yolo	...do.....	1 kangaroo rat; 1 mole.	2	.....
Total	.....	.....	45	.....

SMALLPOX IN THE UNITED STATES

In the following tables the States indicated by an asterisk are those from which reports of smallpox are received only from certain city, and in some cases county, boards of health. In these States, therefore, the recorded cases and deaths should not be taken as showing the general prevalence of the disease. In the States not marked by an asterisk the reports are received monthly from the State boards of health and include all cases reported throughout the State.

Reports Received During Week ended January 27, 1911

Place	Date	Cases	Deaths	Remarks
*Alabama:				
Montgomery	Jan. 7–14	1		
Florida:				
Alachua County	Jan. 8–14	3		
Baker County	Jan. 8–14	1		
Citrus County	Jan. 8–14	1		
Duval County	Jan. 8–14	6		
Escambia County	Jan. 8–14	1		
Franklin County	Jan. 8–14	1		
Gadsden County	Jan. 8–14	17		
Hillsboro County	Jan. 8–14	9		
Jackson County	Jan. 8–14	3		
Lee County	Jan. 8–14	1		
Leon County	Jan. 8–14	6		
Polk County	Jan. 8–14	1		
Santa Rosa County	Jan. 8–14	1		
Taylor County	Jan. 8–14	12		
Washington County	Jan. 8–14	4		
Total for State		67		
Kansas:				
Pawnee County	Nov. 1–30	1		Not previously reported.
Reno County	Nov. 1–30	1		Do.
Total for State		2		
*Louisiana:				
New Orleans	Jan. 8–14	16	1	
*Missouri:				
St. Louis	Jan. 8–14	2		
Montana:				
Cascade County	Dec. 1–31	3		
Custer County	Dec. 1–31	1		
Ravalli County	Dec. 1–31	3		
Silver Bow County, exclusive of Butte.	Dec. 1–31	23		
Butte	Dec. 1–31	20		
Total for State		50		
New York:				
Allegany County	Nov. 1–30	1		
Tompkins County	Nov. 1–30	1		
Total for State		2		
North Carolina:				
Beaufort County	Dec. 1–31	20		
Bladen County	Dec. 1–31	12		
Brunswick County	Dec. 1–31	9		
Cartaret County	Dec. 1–31	2		
Chatham County	Dec. 1–31	5		
Columbus County	Dec. 1–31	23		
Cumberland County	Dec. 1–31	6		
Duplin County	Dec. 1–31	20		
Durham County	Dec. 1–31	300		
Edgecombe County	Dec. 1–31	1		
Granville County	Dec. 1–31	1		
Henderson County	Dec. 1–31	1		
Hertford County	Dec. 1–31	1		
Johnston County	Dec. 1–31	3		
Lee County	Dec. 1–31	3		

SMALLPOX IN THE UNITED STATES—Continued

Reports Received During Week Ended January 27, 1911

Place	Date	Cases	Deaths	Remarks
North Carolina—Continued				
Martin County	Dec. 1-31	10		
New Hanover County	Dec. 1-31	192		
Onslow County	Dec. 1-31	30		
Pender County	Dec. 1-31	15		
Pitt County	Dec. 1-31	8		
Robeson County	Dec. 1-31	75		
Rowan County	Dec. 1-31	1		
Sampson County	Dec. 1-31	1		
Wayne County	Dec. 1-31	1		
Total for State		740		
Pennsylvania	Nov. 1-30	1		
*Tennessee:				
Hamilton County—				
Chattanooga	Jan. 8-14	1		
Shelby County	Dec. 1-31	28	1	
Total for State		29	1	

Reports Received from December 31, 1910, to January 20, 1911

[For reports received from June 25, 1910, to Dec. 30, 1910, see Public Health Reports for Dec. 30, 1910. In accordance with custom, the tables of epidemic diseases are terminated semiannually and new tables begun.]

Place	Date	Cases	Deaths	Remarks
*Alabama:				
Montgomery	Dec. 11-31	3		
Total for State		3		
Colorado:				
Adams County	Dec. 1-31	1		
Arapahoe County	Dec. 1-31	1		
Archuleta County	Dec. 1-31	2		
Boulder County	Dec. 1-31	8		
Conejos County	Dec. 1-31	2		
Denver County	Dec. 1-31	50		
El Paso County	Dec. 1-31	1		
Fremont County	Dec. 1-31	3		
Grand County	Dec. 1-31	2		
Huerfano County	Dec. 1-31	13		
Jefferson County	Dec. 1-31	5		
La Plata County	Dec. 1-31	6		
Las Animas County	Dec. 1-31	3		
Montezuma County	Dec. 1-31	1		
Morgan County	Dec. 1-31	1		
Pueblo County	Dec. 1-31	2		
Saguache County	Dec. 1-31	3		
Total for State		104		
Connecticut	Dec. 1-31			No cases
Florida:				
Alachua County	Dec. 18-Jan. 7	14		
Dade County	Dec. 25-31	1		
Duval County	Jan. 1-7	2	1	
Escambia County	Jan. 1-7	2		
Gadsden County	Dec. 18-24	5		
Hillsboro County	Dec. 25-Jan. 7	27		
Jackson County	Dec. 25-31	4		
Leon County	Dec. 18-Jan. 7	36		
Madison County	Dec. 18-31	18		
Osceola County	Dec. 18-24	1		
Polk County	Dec. 18-31	2		
Walton County	Dec. 25-31	1		
Total for State		113	1	

SMALLPOX IN THE UNITED STATES—Continued

Reports Received from December 31, 1910, to January 20, 1911

Place	Date	Cases	Deaths	Remarks
Iowa:				
Buena Vista County	Dec. 1-31	1		
Lee County	Dec. 1-31	1		
Linn County	Dec. 1-31	18		
Lyon County	Dec. 1-31	3		
Marshall County	Dec. 1-31	1		
Page County	Dec. 1-31	19	1	
Polk County	Dec. 1-31	3		
Scott County	Dec. 1-31	1		
Taylor County	Dec. 1-31	64		
Warren County	Dec. 1-31	1		
Webster County	Dec. 1-31	10		
Woodbury County	Dec. 1-31	4		
Total for State		126	1	
*Louisiana:				
New Orleans	Dec. 18-Jan. 7	42		
Total for State		42		
Maine (entire State)	Dec. 1-31			No cases.
Maryland (entire State)	Dec. 1-31			Do.
Massachusetts	Dec. 1-31			Do.
Michigan:				
Alcona County	Dec. 1-31	1		
Alger County	Dec. 1-31	1		
Arenac County	Dec. 1-31	5		
Bay County	Dec. 1-31	1		
Calhoun County	Dec. 1-31	8		
Charlevoix County	Dec. 1-31	1		
Cheboygan County	Dec. 1-31	17		
Clinton County	Dec. 1-31	3		
Crawford County	Dec. 1-31	4		
Eaton County	Dec. 1-31	3		
Genessee County	Dec. 1-31	4		
Gladwin County	Dec. 1-31		1	Cases reported in November.
Grand Traverse County	Dec. 1-31	1		
Gratiot County	Dec. 1-31	1		
Ingham County	Dec. 1-31	2		
Isabella County	Dec. 1-31	1		
Kalamazoo County	Dec. 1-31	5		
Keweenaw County	Dec. 1-31	7		
Lake County	Dec. 1-31	3		
Lapeer County	Dec. 1-31	1		
Marquette County	Dec. 1-31	7		
Midland County	Dec. 1-31	3		
Missaukee County	Dec. 1-31	3		
Monroe County	Dec. 1-31	2		
Presque Isle County	Dec. 1-31	1		
Saginaw County	Dec. 1-31	3	3	
St. Clair County	Dec. 1-31	1		
Washtenaw County	Dec. 1-31	2		
Wayne County	Dec. 1-31	1		
Wexford County	Dec. 1-31	5		
Total for State		97	4	
*Missouri:				
Kansas City	Nov. 1-30	42		
St. Louis	Dec. 18-Jan. 7	7		
Total for State		49		
Montana:				
Dawson County	Nov. 1-30	1		
Deerlodge County—				
Anaconda	Nov. 1-30	9		
Silverbow County, exclusive of Butte—	Nov. 1-30	1		
Butte	Nov. 1-30	6		
Total for State		17		
New Jersey:				
Bergen County	Dec. 1-31	2		
Total for State		2		

SMALLPOX IN THE UNITED STATES—Continued

Reports Received from December 31, 1910, to January 20, 1911

Place	Date	Cases	Deaths	Remarks
North Carolina:				
Bladen County	Nov. 1-30	1		
Carteret County	Nov. 1-30	2		
Columbus County	Nov. 1-30	23		
Cumberland County	Nov. 1-30	9		
Durham County	Nov. 1-30	40		
Edgecombe County	Nov. 1-30	4		
Franklin County	Nov. 1-30	1		
Martin County	Nov. 1-30	7		
Nash County	Nov. 1-30	6		
New Hanover County	Nov. 1-30	86		
Pasquotank County	Nov. 1-30	1		
Pender County	Nov. 1-30	12		
Pitt County	Nov. 1-30	10		
Robeson County	Nov. 1-30	40		
Union County	Nov. 1-30	1		
Wake County	Nov. 1-30	1		
Total for State		244		
North Dakota:				
Cass County	Dec. 1-31	1		
Morton County	Dec. 1-31	1		
Steele County	Dec. 1-31	5		
Total for State		7		
Oklahoma:				
Adair County	Nov. 1-30	1		
Beekham County	Nov. 1-30	8		
Blaine County	Nov. 1-30	1		
Bryan County	Nov. 1-30	10		
Caddo County	Nov. 1-30	3		
Canadian County	Nov. 1-30	1		
Grady County	Nov. 1-30	2	1	
Green County	Nov. 1-30	1		
Hughes County	Nov. 1-30	2		
McIntosh County	Nov. 1-30	9		
Marshall County	Nov. 1-30	8		
Tulsa County	Nov. 1-30	1		
Washita County	Nov. 1-30	1		
Total for State		48	1	
Pennsylvania, entire State	Oct. 1-31			No cases.
*Tennessee:				
Davidson County—				
Nashville	Jan. 8-14	1		
Hamilton County—				
Chattanooga	Jan. 1-7	2		
Shelby County	Nov. 1-30	15		
Total for State		18		
Texas:				
Cameron County	Nov. 1-30	15		
Grimes County	Nov. 1-30	4		
Henderson County	Nov. 1-30	3		
McLennan County	Nov. 1-30	2		
Van Zant County—				
Willis Point	Nov. 1-30	4	1	
Total for State		28	1	
Utah:				
Beaver County	Nov. 1-30	7		
Cache County	Nov. 1-30	8		
Iron County	Nov. 1-30	22		
Juab County	Nov. 1-30	5		
Millard County	Nov. 1-30	1		
Salt Lake County	Nov. 1-30	10		
Washington County	Nov. 1-30	33		
Weber County	Nov. 1-30	5		
Total for State		91		
*Virginia:				
Portsmouth	Dec. 25-31	5		
Total for State		5		

SMALLPOX IN THE UNITED STATES—Continued

Reports Received from December 31, 1910, to January 20, 1911

Place	Date	Cases	Deaths	Remarks
Washington:				
Skagit County	Nov. 1–30	40		
Spokane County	Nov. 1–30	1		
Total for State		41		
Wisconsin:				
Chippewa County	Dec. 1–31	3		
Dunn County	Dec. 1–31	4		
Iowa County	Dec. 1–31	22		
Jefferson County	Dec. 1–31	6		
Lafayette County	Dec. 1–31	5		
La Crosse County	Dec. 1–31	1		
Milwaukee County	Dec. 1–31	5		
Oneida County	Dec. 1–31	1		
St. Croix County	Dec. 1–31	1		
Vilas County	Dec. 1–31	1		
Washington County	Dec. 1–31	1		
Total for State		50		
Grand total for the United States		1,085	8	

MORBIDITY AND MORTALITY

MORBIDITY AND MORTALITY TABLE, CITIES OF THE UNITED STATES FOR WEEK ENDED JANUARY 7, 1911

Cities	Population, United States census, 1910	Total deaths from all causes	Diphtheria		Measles		Scarlet fever		Smallpox		Tuberculosis		Typhoid fever	
			Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Cities having over 500,000 inhabitants.														
Baltimore, Md	558,485	225	32	1	69	....	18	2	....	....	17	28	15	4
Boston, Mass	670,585	227	62	4	52	....	32	1	....	....	78	26	5	....
Chicago, Ill	2,185,283	776	177	16	90	2	187	13	3	....	116	83	24	5
Cleveland, Ohio	560,663	148	22	....	6	....	47	3	....	....	16	12	3	3
New York, N. Y	4,766,883	1,697	249	29	298	5	420	14	....	....	538	198	27	6
Philadelphia, Pa	1,549,008	520	65	8	189	13	38	4	1	....	83	62	17	....
Pittsburg, Pa	533,905	184	9	4	10	1	18	6	....	....	30	15	19	4
St. Louis, Mo	687,029	275	33	2	223	2	63	2	2	....	43	22	9	3
Cities having from 300,000 to 500,000 inhabitants.														
Buffalo, N. Y	423,715	126	27	....	2	....	40	2	....	....	....	8	5	....
Cincinnati, Ohio	364,463	140	13	....	14	1	42	2	1	....	32	18	2	....
Detroit, Mich	465,766	155	31	2	....	....	21	....	....	....	....	....	3	....
Los Angeles, Cal	319,198	105	19	1	4	....	16	1	1	....	6	14	3	1
Milwaukee, Wis	373,857	79	28	2	4	....	45	1	....	....	23	10	3	....
Newark, N. J	347,469	125	29	2	....	....	23	....	....	....	16	18	3	....
New Orleans, La	339,075	134	8	1	29	....	12	....	9	....	20	10	4	2
San Francisco, Cal	416,912	114	11	....	11	....	18	....	....	....	26	....	5	....
Washington, D. C	331,069	129	6	....	8	1	4	....	....	....	16	12	8	3
Cities having from 200,000 to 300,000 inhabitants														
Jersey City, N. J	267,779	82	10	1	56	1	6	....	....	....	3	10	....	....
Providence, R. I	224,326	73	8	1	....	....	7	....	....	....	7	11	....	....
Seattle, Wash	237,194	25	5	....	98	....	2	....	4	....	1	....	1	....
Cities having from 100,000 to 200,000 inhabitants														
Bridgeport, Conn	102,054	45	2	1	1	....	....	....	....	....	3	....	....	....
Cambridge, Mass	104,839	26	9	....	24	1	5	....	....	....	6	8	1	....
Columbus, Ohio	181,548	63	4	....	....	....	....	....	....	....	11	7	....	1

MORBIDITY AND MORTALITY—Continued

Morbidity and mortality table, cities of the United States, for week ended January 7, 1911—Continued

Cities	Population, United States census, 1910	Total deaths from all causes	Diphtheria		Measles		Scarlet fever		Smallpox		Tuberculosis		Typhoid fever	
			Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Cities having from 100,000 to 200,000 inhabitants—Continued														
Dayton, Ohio	116,577	30	1	....	....	....	2	....	....	....	1	2	....	....
Fall River, Mass	119,295	49	4	1	....	....	....	....	....	....	5	5	1	....
Grand Rapids, Mich	112,571	34	3	1	215	....	5	....	....	....	....	3	4	....
Lowell, Mass	106,294	43	5	....	2	....	4	....	....	....	2	1	1	....
Nashville, Tenn	110,364	49	2	....	50	....	4	....	....	....	1	7	1	....
Oakland, Cal	150,174	37	2	....	....	....	1	....	....	....	2	2	1	....
Spokane, Wash	104,402	28	9	1	7	....	5	....	....	....	....	....	....	1
Toledo, Ohio	168,497	46	8	2	2	....	7	1	....	....	1	5	1	....
Worcester, Mass	145,986	45	14	1	1	1	9	1	....	....	8	5	1	....
Cities having from 50,000 to 100,000 inhabitants														
Altoona, Pa	52,127	15	3	....	....	....	1	....	....	....	....	....	....	....
Bayonne, N. J	55,545	....	3	....	1	....	2	....	....	....	....	....	....	....
Brockton, Mass	56,878	7	....	....	24	1	2	1	....	....	....	1	....	....
Camden, N. J	94,538	....	5	2	64	....	2	2	....	....	1	....	2	....
Canton, Ohio	50,217	13	....	....	....	....	....	....	....	....	....	2	....	....
Covington, Ky	53,270	9	....	....	....	....	....	....	....	....	....	....	....	....
Duluth, Minn	78,466	21	1	....	1	....	3	....	2	....	2	3	2	....
Elizabeth, N. J	73,409	39	4	....	....	....	4	1	....	....	....	3	....	....
Erie, Pa	66,525	22	1	....	....	....	15	....	....	....	11	3	34	1
Evansville, Ind	69,647	9	....	....	....	....	1	....	....	....	....	2	1	....
Hartford, Conn	98,915	27	6	....	....	....	11	....	....	....	1	1	1	....
Hoboken, N. J	70,324	....	3	....	3	....	....	....	....	....	1	....	....	....
Houston, Tex	78,800	35	2	....	....	....	....	....	1	....	....	7	....	....
Jacksonville, Fla	57,699	30	....	....	23	....	11	....	....	....	1	2	....	....
Johnstown, Pa	55,482	14	2	....	....	....	3	....	....	....	8	1	....	....
Kansas City, Kans	82,331	40	5	....	....	....	5	....	1	....	2	1	....	....
Lawrence, Mass	85,892	30	6	2	4	....	3	....	....	....	2	2	....	....
Lynn, Mass	89,336	28	3	....	46	....	7	....	....	....	1	2	....	....
Manchester, N. H	70,063	36	2	....	....	....	1	....	....	....	3	3	3	....
New Bedford, Mass	96,652	....	....	....	....	....	5	....	....	....	3	4	1	....
Reading, Pa	96,071	22	2	1	14	....	7	1	....	....	1	3	1	....
Salt Lake City, Utah	92,777	....	....	....	....	....	....	....	....	....	....	....	....	....
San Antonio, Tex	96,614	4	2	....	....	....	1	....	....	....	....	4	1	....
Schenectady, N. Y	72,826	21	1	....	....	....	....	....	....	....	4	2	2	1
Somerville, Mass	77,236	25	1	....	3	....	3	....	....	....	....	....	1	....
South Bend, Ind	53,684	17	....	....	3	....	2	....	....	....	....	....	....	....
Springfield, Mass	88,926	29	2	....	5	....	1	....	....	....	4	3	1	....
Tacoma, Wash	83,743	25	6	1	....	....	4	1	....	....	....	....	1	1
Terre Haute, Ind	58,157	18	1	....	4	....	2	....	....	....	....	2	....	1
Trenton, N. J	96,815	4	4	1	....	....	5	....	....	....	2	3	1	....
Wichita, Kans	52 450	16	2	....	1	....	6	....	....	....	....	....	....	....
Wilkes-Barre, Pa	67 105	20	6	....	....	1	4	....	....	....	12	4	1	....
Wilmington, Del	87,411	28	....	....	....	....	....	....	....	....	....	2	....	....
Yonkers, N. Y	79,803	17	3	....	....	....	12	....	....	....	....	1	....	....
Cities having from 25,000 to 50,000 inhabitants														
Auburn, N. Y	34,668	12	3	1	5	....	1	....	....	....	....	....	....	....
Aurora, Ill	29,807	9	1	....	....	....	1	....	....	....	....	....	....	....
Berkely, Cal	40,434	5	....	....	....	....	1	....	....	....	....	....	....	....
Binghamton, N. Y	48,443	14	4	....	21	....	....	....	....	....	....	....	1	2
Charlotte, N. C	34,014	5	....	....	1	....	3	....	1	....	....	....	1	....
Chattanooga, Tenn	44,604	....	1	....	....	....	2	....	2	....	2	....	....	....
Chelsea, Mass	32,452	11	1	....	2	....	6	....	....	....	....	....	....	....
Chicopee, Mass	25,401	14	1	....	....	....	....	....	....	....	....	2	5	....
Council Bluffs, Iowa	29,292	17	....	....	....	....	4	....	....	....	....	1	3	....
Danville, Ill	27,871	6	2	....	....	....	2	....	....	....	1	1	....	....
Dubuque, Iowa	38,494	....	....	....	....	....	3	....	....	....	....	....	....	....
Elmira, N. Y	37,176	8	1	....	....	....	2	....	....	....	9	....	....	1
El Paso, Tex	39,279	27	8	1	....	....	1	....	2	....	15	4	....	....
Everett, Mass	33,484	4	1	....	....	....	1	....	....	....	4	1	....	....
Frankfort, Ind	26,672	6	....	....	1	....	2	....	....	....	....	....	....	....
Haverhill, Mass	44,115	8	5	....	2	....	4	....	....	....	2	....	....	....
Kalamazoo, Mich	9,437	8	....	....	52	....	5	....	....	....	2	2	....	....

MORBIDITY AND MORTALITY—Continued

Morbidity and mortality table, cities of the United States, for week ended January 7, 1911—Continued

Cities	Population, United States census, 1910	Total deaths from all causes	Diphtheria		Measles		Scarlet fever		Smallpox		Tuberculosis		Typhoid fever	
			Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Cities having from 25,000 to 50,000 inhabitants—Con.														
Kingston, N. Y.	25,908													
Knoxville, Tenn	36,346	12	1		47							2		
La Crosse, Wis.	30,417	10	1		3				1					
Lancaster, Pa.	47,227	14	2	1	1		6					1		
Lexington, Ky.	35,099	20	1		1		1				13	4		
Lynchburg, Va.	29,494		1				2						1	
Malden, Mass.	44,404	9			1		6							
Montgomery, Ala.	38,136													
Mount Vernon, N. Y.	30,919	5	1		2		3	1						
Newport, Ky.	30,309	12					3							
Newton, Mass.	39,806	12	2	1	19		7				3			
Niagara Falls, N. Y.	30,445		2		1							1	2	
Norristown, Pa.	27,875	9	1				2				1			
Orange, N. J.	29,630	16	2		4		4				2	3	1	
Pittsfield Mass.	32,121													
Portsmouth, Va.	33,190	13						1						
Roanoke, Va.	34,874	7	2	1			6				1		1	
Sacramento, Cal.	44,696	20	1		1		1				1	1		
Superior, Wis.	40,384	9	2				1					3		
Taunton, Mass.	34,259	22	2	1			2				2	3		
Topeka, Kans.	43,684	0			1		1		1		1			
Waltham, Mass.	27,834	13	2		3		1				3			1
Wheeling, W. Va.	41,641	10	4				1				3		10	1
Williamsport, Pa.	31,860	15			1			1				1		
York, Pa.	44,750		5				4						2	
Cities having less than 25,000 inhabitants														
Ann Arbor, Mich.	14,817	3	1				7				2			
Ashtabula, Ohio	18,266													
Beaver Falls, Pa.	12,191													
Bedford, Ind.														
Bennington, Vt.														
Biddeford, Me.	17,079	7										1	1	
Braddock, Pa.	19,357	7	3		2		1				1	2	1	
Butler, Pa.	20,728	7	2									1		
Cambridge, Ohio	11,327	2	1				1						1	
Camden, S. C.														
Carbondale, Pa.	17,040	4												
Clinton, Ind.														
Clinton, Mass.	13,075	5	1								1			
Coffeyville, Kans.	12,687	5									1		1	
Columbus, Ga.	20,554	5												
Columbus, Ind.		3					1							
Concord, N. H.	21,497	6	5	1									1	
Covington, Ohio														
Cumberland, Md.	21,839	16										1	12	1
Dunkirk, N. Y.		7	5	1	1		4	1						
Elyria, Ohio	14,825	2					5							
Freeport, Ill.	17,567	9	2						1					
Galesburg, Ill.	22,089	6	1				3							
Gloucester, Mass.	24,398	4										1		
Greensboro, N. C.	15,895	7					1					1	1	
Harrison, N. J.	14,498		2				1							
Hyde Park, Mass.	15,507	3			5								1	
Kearney, Nebr.														
Kearny, N. J.	18,659	6	1		11						2		1	
Kokomo, Ind.	17,010													
La Fayette, Ind.	20,081	7	1	1			2							
Lebanon, Pa.	19,240	5	1										1	
Madison, Ind.														
Manistee, Mich.	12,381	0					1							
Manitowoc, Wis.	13,027	4												
Marinette, Wis.	14,610	2									1	1		
Marlboro, Mass.	14,579	5												
Massillon, Ohio	13,879	5												
Medford Mass.	23,150	3	1				3				3			
Melrose Mass.	15,715	3	1				1							

MORBIDITY AND MORTALITY—Continued

Morbidity and mortality table, cities of the United States, for week ended January 7, 1911—Continued

Cities	Population, United States census, 1910	Total deaths from all causes	Diphtheria		Measles		Scarlet fever		Smallpox		Tuberculosis		Typhoid fever	
			Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
***Cities having less than 25,000 inhabitants*—Con.**														
Moline, Ill	24,199	6	4	1	9	....	1	....	....	....	1	....	4	....
Montclair, N. J	21,550	6	....	....	....	....	1	....	....	....	1	1	....	....
Morristown, N. J	12,507	9	2	....	....	....	....	....	....	....	1	....	....	....
Nanticoke, Pa	18,877	6	2	....	....	....	....	....	....	....	....	....	....	....
Newburyport, Mass	14,949	9	1	....	3	....	....	....	....	....	1	....	....	....
North Adams, Mass	22,019	9	....	....	4	....	....	....	....	....	....	....	....	....
Northampton, Mass	19,431	9	....	....	....	....	....	....	....	....	....	....	....	....
Ottumwa, Iowa	22,012	10	....	....	....	....	....	....	....	....	....	....	....	....
Paducah, Ky	22,700	....	....	....	....	....	....	....	....	....	....	....	....	....
Palmer, Mass	....	4	1	....	....	....	....	....	....	....	....	....	....	....
Peekskill, N. Y	....	4	....	....	....	....	1	....	....	....	....	....	....	....
Plainfield, N. J	20,550	3	1	....	....	....	1	....	....	....	2	....	1	....
Portsmouth, N. H	11,269	....	1	....	....	....	....	....	....	....	....	....	....	....
Pottstown, Pa	15,599	3	....	....	1	....	2	....	....	....	....	....	....	....
Rock Island, Ill	....	7	2	1	....	....	....	....	....	....	1	1	....	....
Rutland, Vt	13,546	9	....	....	....	....	....	....	....	....	....	....	1	....
Saratoga Springs, N. Y	....	4	4	....	....	....	....	....	....	....	....	....	....	....
South Bethlehem, Pa	19,973	9	....	....	....	....	....	....	....	....	2	1	3	....
Steelton, Pa	14,246	10	1	....	....	....	1	....	....	....	3	....	1	....
Warren, Ohio	11,081	....	....	....	....	....	....	....	....	....	....	....	....	....
Wilkinsburg, Pa	18,924	3	....	....	....	....	....	....	....	....	....	....	1	....
Woburn, Mass	15,308	4	....	....	....	....	....	....	....	....	....	....	....	....
Zanesville, Ohio	....	9	....	....	9	....	....	....	....	....	....	1	6	2

STATISTICAL REPORTS OF MORBIDITY AND MORTALITY, STATES AND CITIES OF THE UNITED STATES (untabulated)

FLORIDA.—Week ended January 7, 1911. Reports from the State board of health show typhoid fever present in 1 locality (Tampa) with 1 case, smallpox in 5 counties (Alachua, Duval, Escambia, Hillsboro, Leon) with 25 cases (1 death), diphtheria in 2 localities with 2 cases, malaria in 4 localities (Tampa, Plant City, Jacksonville, Gainesville) with 13 cases, tuberculosis in 7 localities with 14 cases.

Pensacola.—Month of December, 1910. Population, 30,000. Total number of deaths from all causes 48, including tuberculosis 1.

ILLINOIS—*Alton.*—Month of December, 1910. Population, 17,528. Total number of deaths from all causes 16, including tuberculosis 2. Cases reported: Smallpox 2, scarlet fever 1, diphtheria 7.

Quincy.—Month of December, 1910. Population, 36,587. Total number of deaths from all causes 66, including typhoid fever 1, diphtheria 1, tuberculosis 4. Cases reported: Typhoid fever 2, smallpox 7, measles 3, scarlet fever 6, diphtheria 4.

IOWA—*Cedar Rapids.*—Month of December, 1910. Population, 33,817. Total number of deaths from all causes 34, including typhoid fever 3. Cases reported: Smallpox 17, scarlet fever 1, diphtheria 10.

KENTUCKY—*Henderson.*—Month of December, 1910. Population, 17,500. Total number of deaths from all causes 13, including tuberculosis 4. Cases reported: Typhoid fever 1, tuberculosis 1.

LOUISIANA—*Shreveport.*—Month of December, 1910. Population, 30,000. Total number of deaths from all causes 81, including typhoid fever 3, tuberculosis 11, of which 9 were of nonresidents.

MINNESOTA—*Stillwater.*—Month of December, 1910. Population, 12,528. Total number of deaths from all causes 18, including tuberculosis 4. Cases reported: Scarlet fever 1.

NEW YORK.—Month of November, 1910. Population, 8,871,720. Total number of deaths from all causes 10,726, including typhoid fever 163, measles 30, scarlet fever 79, diphtheria 194, tuberculosis 1,207. Cases reported: Typhoid fever 989, smallpox 2, measles 1,593, scarlet fever 1,673, diphtheria 2,144, tuberculosis 3,240.

NORTH CAROLINA.—Month of November, 1910. Reports from the State Board of Health show typhoid fever present in 51 counties, smallpox in 16 counties, measles in 7 counties, scarlet fever in 40 counties, diphtheria in 58 counties, malarial fever in 4 counties, pernicious malarial fever in 7 counties, hemorrhagic malarial fever in 7 counties.

PENNSYLVANIA.—Reports from the State Department of Health show as follows:

Mortality.—Month of October, 1910. The total number of deaths reported was 9,403, including typhoid fever 287, scarlet fever 69, diphtheria 234, measles 27, whooping cough 91, influenza 14, malarial fever 4, tuberculosis of the lungs 655, tuberculosis of other organs 131, cancer 445, diabetes 57, meningitis 61, acute anterior poliomyelitis 50, pneumonia 785, diarrhea and enteritis under 2 years 850, diarrhea and enteritis over 2 years 130, Bright's disease 489, early infancy 697, suicide 84, accidents in mines and quarries 91, railway injuries 110, other forms of violence 415, all other diseases 3,627.

Morbidity.—Month of November, 1910. Cases of communicable diseases were reported as follows: Anterior poliomyelitis 95, cerebrospinal meningitis 6, chickenpox 648, diphtheria 1,834, erysipelas 95, German measles 36, malarial fever 2, measles 1,441, mumps 271, pneumonia 482, puerperal fever 3, rabies 1, scarlet fever 981, smallpox 1, tetanus 12, trachoma 5, tuberculosis 991, typhoid fever 1,442, whooping cough 666, total 9,012.

SOUTH CAROLINA—*Charleston.*—Month of December, 1910. Population 58,833. Total number of deaths from all causes 130, including typhoid fever 2, diphtheria 1, pellagra 1, tuberculosis 13. Cases reported: Typhoid fever 2, scarlet fever 1, diphtheria 6.

FOREIGN AND INSULAR

ARABIA

Cholera in Vicinity of Hodeida

Information received from the Department of State January 18 shows cholera present at Bajil, in the vicinity of Hodeida, as reported by Consul Moser at Aden.

Cholera at Hodeida and Perim

Further information was received from the Department of State January 23, as follows:

Consul at Aden reports cholera present at Hodeida and Perim.

CHINA

Amoy—Plague

The following information was received from the Department of State January 23:

Cablegram from Amoy states plague present.

Plague at Tientsin

The following information was received from the Department of State January 21:

The American consul general at Tientsin reports 4 deaths from pneumonic plague among Chinese.

CUBA

Quarantine Against Yucatan Raised—Transmissible Diseases

Acting Assistant Surgeon Villoldo at Habana reports, January 17:

Quarantine against arrivals from Yucatan, Mexico, was raised January 9. The order went into effect January 11.

The following statement of transmissible diseases in the island of Cuba was issued by the national department of sanitation:

October 1–31, 1910

Diseases	New cases	Deaths	Remaining under treatment
Tuberculosis	120	188	2,779
Leprosy	1	1	344
Malaria	252	13	220
Typhoid fever	40	6	48
Diphtheria	70	5	22
Measles	145	6	67
Scarlet fever	25	1	15
Varicella	12	.....	3
Tetanus in the new born	15	15	.....
Beriberi	5	.....	5
Filariasis	1	.....	1
Dengue	.....	.....	2

No quarantinable diseases were reported in the island during the week ended January 14.

HAWAII

Record of Plague Infection

Last case of human plague at Honolulu occurred July 12, 1910.

The last plague-infected rat was found at Aiea, 9 miles from Honolulu, April 12, 1910.

At Hilo the last case of human plague occurred March 23, 1910. A fatal case occurred at Honokaa, 60 miles from Hilo, December 17, 1910.

The last plague-infected rat was found at Honokaa, 60 miles from Hilo, December 20, 1910.

Passed Asst. Surg. Ramus reports in regard to plague-prevention work, January 3:

HONOLULU

Week ended Dec. 31, 1910

Total rats and mongoose taken	538
Rats trapped	462
Mongoose trapped	3
Rats shot from trees	23
Rats killed by sulphur dioxide	50
Examined bacteriologically	486
Classification of rats trapped:	
Mus alexandrinus	75
Mus musculus	101
Mus norvegicus	49
Mus rattus	237
Classification of rats shot from trees:	
Mus alexandrinus	13
Mus rattus	6
Classification of rats killed by sulphur dioxide:	
Mus alexandrinus	36
Mus rattus	14
Average number of traps set daily	1,720

Further Relative to Smallpox on Steamships

Dr. Ramus reported January 4:

The steamship *Mongolia* from Yokohama arrived at Honolulu December 23, 1910, with a case of smallpox on board in the person of a Chinese steerage passenger. The case had been discovered and isolated en route. The *Mongolia* was taken to the quarantine wharf and all steerage passengers with their baggage were removed. After disinfection and bathing of oriental steerage passengers, those destined for San Francisco were returned to the vessel with their effects. Those for Honolulu were removed to the quarantine station for 14 days' detention. The infected portions of the vessel were disinfected. All personnel had been vaccinated at sea by the ship's surgeon.

The steamship *Kiho Maru* arrived December 30, 1910, at Honolulu from Manzanillo, Mexico, having previously touched at Valparaiso, Iquique, Callao, Guayaquil, and Salina Cruz. There were 92 steerage passengers on board, taken from the various ports of call. Three cases of smallpox were found among these passengers. All were of mild type and occurred in one family the members of which had embarked at Guayaquil. They were a mother and two infant children.

The mother had been vaccinated. The patients had not been isolated or vaccinated on board and no precautions taken. The vessel was held far outside the harbor at Honolulu and fumigated throughout to destroy mosquitoes. It was then brought to the quarantine wharf, where steerage passengers were bathed and their effects disinfected. The smallpox cases and 8 passengers for Honolulu were taken to the quarantine station. All on board were vaccinated. The decks, steerage, and forecastle were mechanically cleaned.

INDIA

CALCUTTA—Cholera, Plague, and Smallpox

Acting Assistant Surgeon Allan reports December 22:

During the week ended December 3, 1910, there were 41 deaths from cholera, 10 from plague, and 1 from smallpox in Calcutta; in all Bengal, 685 cases of plague with 458 deaths; in all India, 10,263 cases of plague with 8,020 deaths.

ITALY

Cholera

Surg. Geddings at Naples reports, January 9:

Cholera has again established itself in southern Italy. The last official bulletin was published December 20, 1910, but having learned from private sources that cholera was existent and was spreading in the Province of Lecce and that several places in the Province of Bari were also infected and that conditions in Caserta and in the cities of Palermo and Salerno were far from satisfactory, on January 4 a letter was addressed to the American vice consul in charge stating these facts and requesting him to endeavor to obtain from the American ambassador at Rome information relative to the general sanitary condition, in accordance with the convention of Paris.

To-day a bulletin was issued from Rome covering the period from December 27, 1910, to January 6, 1911, showing the existence of cholera, as follows:

	Cases.	Deaths.
Province of Catanzaro:		
Catanzaro (city)	2	2
Province of Bari:		
Gioia del Colle	1	.....
Monopoli	1	1
Noci	1	1
Palo del Colle	1	.....
	4	2
Province of Lecce:		
Brindisi	1	1
Carovigno	3	.....
Ceglie Messapico	1	.....
Figgiano	1	.....
Castellaneta	3	.....
Laterza	2	.....
Leporano	1	.....
Lizzano	1	.....
Massafra	2	.....
Province of Lecce—Continued.		
Mottola	1	.....
Pulsano	1	.....
S. Giorgio	1	.....
Taranto	15	1
	33	2
Province of Palermo:		
Palermo (insane asylum)	1	.....
Province of Rome:		
Velletri	1	.....
Province of Salerno:		
Salerno (city)	3	.....
Province of Caserta:		
Elena	1	.....
Grazzanise	1	.....
	2	.....

The situation is disquieting. The disease is evidently again on the increase, and the city of Naples is very probably in more danger from reinfection from the Province of Bari than it was last August, for then the authorities were more active than at present. The sanitary condition is not good. The term "gastro-enteritis" has again made its appearance in the local sanitary reports.

Large exhibitions are to be held this year in Rome and Turin, and every effort is being made by those interested to attract tourists in more than the usual number. If conditions do not improve in the near future, it is believed that prospective travelers should be nformed as to the possible dangers of travel in Italy during the coming spring and summer, as matters may possibly get worse rather than better.

JAPAN

Smallpox on Steamship Shimosa at Kobe

Surg. Irwin, at Yokohama, reports December 28:

The steamship *Shimosa* from New York via ports arrived December 26 at Yokohama, having landed one of her officers ill with smallpox at Kobe. On arrival at Yokohama the vessel was sent to the quarantine station at Nagahama. The entire personnel has been vaccinated.

MADEIRA ISLANDS

Status of Cholera

Chargé d'affaires ad interim Lorillard, at Lisbon, Portugal, reported December 29 to the Department of State:

From the beginning of the cholera epidemic in the Madeira Islands to December 21, 1910, there have been officially reported 1,089 cases, with 315 deaths. Of these, 438 cases, with 119 deaths, occurred in the Funchal district, and 651 cases, with 196 deaths, in the rural districts. At the Funchal lazaretto there are remaining 27 patients, in the Santa Antonia Hospital 3, the Camara de Lobos Hospital 13, Machico Hospital 11, and Ribeira Brava Hospital 1 case.

MANCHURIA

Status of Plague

Minister Rockhill, at St. Petersburg, Russia, reported December 29 to the Department of State:

A bulletin issued December 16, 1910, by the plague commission shows for the period from December 5 to 11 the occurrence of 14 new cases of plague and 15 deaths within the limits of the radius allotted to the East-Chinese Railroad in Manchuria. Of these, 12 new cases and 13 deaths occurred at Manchuria station, 1 case with 1 death at Harbin, 1 case with 1 death at Hailar. From the beginning of the outbreak to December 11 the total number of cases reported was 482 among Chinese and 11 among Russians, with 481 deaths among Chinese and 10 among Russians.

Plague at Dalny

The following information was received from the Department of State January 18:

The American ambassador at Tokyo, Japan, reports January 18 as follows:

Consul Williamson, at Dalny, reports 5 new cases of plague, with a total to date of 9 cases. The Chinese are not allowed to enter leased territory without quarantine.

PERU

Status of Plague

Acting Asst. Surg. Castro Gutierrez, at Callao, reports December 30, 1910:

The following statement of plague in Peru was received from the director of public health:

Month of November, 1910

Department	Cases remaining Nov. 1	New	Recovered	Died	Remaining Nov. 30
Arequipa	.....	4	.....	2	2
Callao	1	1	1	.....	1
Lambayeque	.....	2	2	.....	.....
Libertad	10	41	9	15	25
Lima	2	2	2	1	1
Piura	.....	13	2	7	4

There has been no new case of plague in Callao since November 12, 1910. At Lima from December 11 to 17, 1 new case of plague was reported, with 2 cases remaining December 17.

Bills of health from ports south of Callao show as follows: At Mollendo, Peru, December 24, 2 cases of plague in lazaretto; at Arica, Chile, a few isolated cases of plague; at Valparaiso, Chile, December 7, 117 cases of smallpox in preceding two weeks.

Fumigation of Vessels to Destroy Mosquitoes

Acting Assist. Surg. Castro Gutierrez further reports: In view of the increase of yellow fever at Guayaquil the director of public health at Lima has ordered the fumigation of vessels arriving at ports of Peru from Guayaquil for the purpose of destroying mosquitoes. Passengers in transit, not having landed at Guayaquil, will be quarantined on board to complete the six days' period from that port. This requirement is extended to include arrivals from Matadero, which is the place of anchorage for Guayaquil.

RUSSIA

Status of Cholera

Minister Rockhill at St. Petersburg reported December 27 and 30 to the Department of State:

During the week ended December 10, 1910, there were officially reported in all Russia 33 cases of cholera with 17 deaths, of which 8

cases with 3 deaths occurred in the city of St. Petersburg, and during the week ended December 17, there were reported 13 cases with 9 deaths, of which 1 case with 1 death occurred in the city of St. Petersburg.

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX

Reports Received During Week ended January 27, 1911

[These tables include cases and deaths recorded in reports received by the Surgeon General, Public Health and Marine-Hospital Service, from American consuls through the Department of State and from other sources.]

CHOLERA

Place	Date	Cases	Deaths	Remarks
Arabia:				
Bajil	Jan. 18	.....	.....	Present.
Hodeida	Jan. 23	.....	.....	Do.
Perim	Jan. 23	.....	.....	Do.
India:				
Calcutta	Nov. 27–Dec. 3	.....	41	
Bombay	Dec. 14–20	.....	14	
Japan:				
Formosa	Dec. 11–17	2	2	
Java:				
Batavia	Dec. 4–10	1	1	
Persia:				
Assadabad	Oct. 5–Nov. 8	.....	61	
Birjend	Nov. 10	.....	.....	Present.
Enzeli	Nov. 8–25	9	11	Present in vicinity and in Pirś-Bazar.
Hamadan	Oct. 6–Dec. 3	42	22	
Kasri-Churine	Oct. 13–20	.....	5	
Kerman	Nov. 22–30	67	25	
Kermanchah	Nov. 5–10	.....	6	
Resht	Nov. 19–Dec. 3	48	42	Present in all villages in vicinity.
Mollah-Ali	Nov. 20	6	.....	
Turbat-i-Hidari	Oct. 10–Nov. 15	66	25	
Russia		.....	.....	Total for Russia, Dec. 4–17: Cases, 46; deaths, 26.
Baku government	Dec. 1 –17	3	1	
Batum government	Dec. 4–10	2	1	
Erivan government	Dec. 4–10	.....	1	
Kief government	Dec. 4–17	11	5	
St. Petersburg government—				
St. Petersburg	Dec. 4–17	9	4	
Saratov government	Dec. 4–10	3	3	
Tambov government	Dec. 4–10	1	.....	
Yekaterinislav government.	Dec. 4–10	17	11	
Sumatra:				
Bambel	Dec. 29	.....	.....	Present.[1]
Keretan	Dec. 29	.....	.....	Do.
Tripoli:				
Tripoli	Dec. 2–8	.....	1	
Turkey:				
Adrianople	Dec. 2–8	2	3	
Constantinople	Dec. 23–Nov. 8	215	123	Total, from Sept. 13: Cases, 860; deaths, 496.
Saloniki	Dec. 25–31	2	1	
Turkey in Asia:				
Bagdad	Dec. 5–11	22	16	And vicinity.
Trebizond	Dec. 4–11	13	8	
Zongouldak	Dec. 2–9	1	1	

YELLOW FEVER

Place	Date	Cases	Deaths	Remarks
Brazil:				
Para	Dec. 11–31	55	25	
Venezuela:				
Caracas	Dec. 18–24	9	.....	

[1] Bulletin Quarantenaire d'Egypte, Dec. 29, 1910.

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued

Reports Received During Week Ended January 27, 1911

PLAGUE

Place	Date	Cases	Deaths	Remarks
Chile:				
Arica	Dec. 23			Present.
China:				
Amoy	Jan. 23			Do.
Chefoo	Jan. 21			Do.
Tientsin	Jan. 21		4	
India:				
Bombay	Dec. 14-20		5	
Calcutta	Nov. 27-Dec. 3		10	
Madras	Dec. 11-17		1	
Manchuria:				
Dalny	Jan. 11-18	7		
Peru:				
Arequipa department	Nov. 1-30	4	2	Mollendo, Dec. 24, 2 cases in the lazaretto.
Callao department	Nov. 1-30	1		
Lambayeque department	Nov. 1-30	2		
Libertad department	Nov. 1-30	41	15	
Lima department	Nov. 1-30	2	1	At Lima Dec. 11-17, 1 case.
Piura department	Nov. 1-30	13	7	

SMALLPOX

Brazil:				
Para	Dec. 11-31	10	5	
Ceylon:				
Colombo	Dec. 4-10	6	1	
Canada:				
British Columbia—				
Victoria	Jan. 1-14	16		
New Brunswick—				
Newcastle	Jan. 7-14			In vicinity.
Nova Scotia—				
Louisburg	Jan. 1-14	8		
Sydney	Jan. 1-14	3		
Ontario—				
Toronto	Jan. 8-14	2		
Ceylon:				
Colombo	Nov. 27-Dec. 3	5	3	
China:				
Chefoo	Dec. 11-17			Present among natives.
Hongkong	Dec. 4-10	2	1	
Chile:				
Talcahuano	Dec. 11-17	7		
Valparaiso	Dec. 11-17	96		
India:				
Bombay	Dec. 14-20		4	
Calcutta	Nov. 27-Dec. 3		1	
Madras	Dec. 11-17	6	3	
Japan:				
Kobe	Dec. 26	1		From s. s. Shimosa from New York via ports.
Egypt:				
Cairo	Dec. 10-23	1	2	
Port Said	Dec. 17-23	1		
Mexico:				
Aguascalientes	Dec. 25-Jan. 7		6	
Mexico	Nov. 20-Dec. 17	8	2	
Tampico	Jan. 1-10	10	3	
Netherlands:				
Rotterdam	Dec. 11-17	2		
Peru:				
Truxillo	Dec. 19		2	Present in vicinity.
Russia:				
Libau	Dec. 26-Jan. 1	1		
St. Petersburg	Dec. 18-24	25	7	
Spain:				
Valencia	Dec. 18-31	4		
Turkey in Asia:				
Beirut	Dec. 24-31	2		
Smyrna	Dec. 18-24	1		
Uruguay:				
Montevideo	Nov. 1-30	21	5	

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued

Reports Received from December 31, 1910, to January 20, 1911

[For reports received from June 25, 1910, to Dec. 30, 1910, see PUBLIC HEALTH REPORTS for Dec. 30, 1910. In accordance with custom, the tables of epidemic diseases are terminated semiannually and new tables begun.]

CHOLERA

Place	Date	Cases	Deaths	Remarks
Arabia:				
Muscat	Nov. 20-30	7	7	
Austria-Hungary	Aug. 3-Nov. 7			Two deaths not previously reported.
Croatia and Slavonia	Dec. 4-17	3		
Maren	Oct. 1-9	3		
Hungary				Total for Hungary, Nov. 27-Dec. 17: Cases, 9; deaths, 3.
Bulgaria:				
Varna	Nov. 29	2		From steamship Bulgarie, 3 fatal cases having been reported on p. 1936, Vol. XXV.
China:				
Niuchwang	Aug. 1-Nov. 22			Occasional cases.
Shanghai	Aug. 1-31		1	Reported out of date.
Formosa	Nov. 20-Dec. 17	11	5	Mainly in Kelung and Taihoku.
India:				
Bombay	Nov. 23-Dec. 13		13	
Calcutta	Nov. 13-26		98	
Madras	Nov. 27-Dec. 10		2	
Italy				Total for Italy, Dec. 27-Jan. 6: Cases, 41; deaths, 4.
Provinces—				
Aquila	Dec. 4-17	4	1	
Caltanisetta	Dec. 4-10	1		
Caserta	Dec. 4-24	12	2	
Lecce	Dec. 11-24	15	1	
Palermo—				
Palermo	Dec. 4-10	16	6	
Insane asylum	Dec. 4-24	23	6	
Rome	Dec. 4-24	9	7	
Salerno	Dec. 11-24	7		
Japan				Total for Japan, Sept. 14-Nov. 30: Cases, 2,770; deaths, 1,923; including cases and deaths appearing on p. 1937, Vol. XXV.
Aichi ken	Oct. 16-Nov. 30	3	3	
Ehime ken	Sept. 23-Nov. 30	27	19	
Fukuoka ken	Sept. 30-Nov. 30	234	165	
Hiogo ken, Kobe	Sept. 12-Nov. 30	607	396	
Hiroshima ken	Sept. 25-Nov. 30	58	30	
Kagawa ken	Oct. 2-Nov. 30	293	201	
Kagoshima ken	Oct. 28-Nov. 30	4	3	
Kochi ken	Oct. 18-Nov. 30	70	42	
Kyoto fu	Sept. 30-Nov. 30	143	119	
Kumamoto ken	Oct. 18-Nov. 30	19	11	
Miye ken	Oct. 11-Nov. 30	8	5	
Nagasaki ken	Oct. 16-Nov. 30	26	11	Dec. 12-18, 2 cases.
Nara ken	Oct. 3-Nov. 30	31	23	
Oita ken	Oct. 10-Nov. 30	2	1	
Okayama ken	Sept. 29-Nov. 30	71	49	
Osaka fu	Sept. 17-Nov. 30	951	692	
Saga ken	Oct. 4-Nov. 30	51	31	
Shiga ken	Nov. 20-30	7	6	
Shimane ken	Oct. 24-Nov. 30	7	5	
Tokushima ken	Oct. 3-Nov. 30	59	37	
Tokyo fu	Oct. 18-Nov. 30	1	1	
Wakayama ken	Oct. 6-Nov. 30	57	44	
Yamaguchi ken	Oct. 12-Nov. 30	41	29	
Java:				
Batavia	Nov. 13-Dec. 3	12	3	Among natives.
Samarang	Sept. 11-Oct. 31	442	371	
Soerobaya	Oct. 23-Nov. 12	10	8	
Korea:				
Seoul	Oct. 26-Nov. 5	1	1	
Madeira				Total Funchal district, Nov. 16-Dec. 21: Cases, 438; deaths, 119. Rural districts: Cases, 651; deaths, 196.
Funchal	Nov. 30-Dec. 8	126	36	
Camara dos Lobos	Nov. 16-Dec. 8	112	32	
Ponto do Sol	Nov. 16-Dec. 8	54	20	
Santa Cruz	Nov. 16-Dec. 8	15	8	
Machico	Nov. 16-Dec. 8	31	5	
Porto Santo Island	Nov. 16-Dec. 8	7	3	

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued

Reports Received from December 31, 1910, to January 20, 1911

CHOLERA—Continued

Place	Date	Cases	Deaths	Remarks
Philippine Islands:				
Manila	Nov. 6-Dec. 3	8	6	
Provinces—				
Bulacan	Nov. 6-19	4	3	
Ilocos Sur	Nov. 6-10	53	34	
Mindoro	Nov. 6-Dec. 10	24	17	
Rizal	Nov. 6-Dec. 3	4	1	
Union	Nov. 6-12	3	1	
Russia:				
Baku government				Total for Russia, Nov. 20-Dec. 11: Cases, 485; deaths, 274.
Baku	Nov. 6-Dec. 3	3	1	
Don territory	Nov. 6-19	6	2	
Erivan government	Nov. 6-Dec. 3	4	3	
Ferghana territory	Nov. 6-19	6	6	
Kharkov government	Nov. 6-12	2		
Kazan government	Nov. 6-12	1		
Kherson government	Nov. 6-Dec. 3	4	4	
Kief government	Nov. 6-Dec. 3	28	9	
Kuban territory	Nov. 6-13	4	4	
Lublin government	Nov. 20-26	31	13	
Mohilev government	Nov. 6-19	2	1	
Orenburg government	Nov. 13-19	1	1	
Oufa government	Nov. 6-12	2	1	
Perm government	Nov. 20-26	1		
Podolia government	Nov. 13-19	3	1	
Rjasan government	Nov. 6-12	2		
St. Petersburg government—	Nov. 6-12	2		
St. Petersburg	Nov. 6-26	22	11	
Samara government	Nov. 6-19	6		
Saratov government	Nov. 13-26	8	6	
Siberia, eastern	Nov. 6-19	12	3	
Syr Darya territory	Nov. 6-19	7	4	
Taurida government—				
Sebastopol	Nov. 13-Dec. 3	7	4	
Tambov government	Nov. 13-Dec. 3	85	34	
Tiflis government	Nov. 6-26	2		
Vitebsk government	Nov. 6-19	3	2	
Veronesch government	Nov. 6-12	2		
Yekaterinoslav government.	Nov. 6-Dec. 3	34	19	
Siam:				
Bangkok	Nov. 6-Dec. 3	136	131	
Sumatra:				
Biagmoeti	Nov. 14			Present.
Pengoeloedjahar	Nov. 14			Do.
Tripoli:				
Tripoli	Nov. 15-Dec. 1	37	36	
Turkey:				
Adrianople	Nov. 21-Dec. 1	55	66	94 cases and 34 deaths reported, p. 1940, Vol. XXV.
Saloniki	Dec. 11-24	30	12	
Turkey in Asia:				
Bagdad vilayet	Nov. 20-Dec. 4	97	99	
Basra	Nov. 6-26	10	9	
Samsoun	Nov. 20-Dec. 3	6	6	
Smyrna	Nov. 20-Dec. 16	66	49	
Trebizond	Nov. 20-Dec. 4	89	31	And vicinity.
Zongouldak	Nov. 20-Dec. 2	7	3	Do.

YELLOW FEVER

Brazil:				
Manaos	Dec. 4-24		13	
Para	Nov. 27-Dec. 10	69	26	
Ecuador:				
Guayaquil	Nov. 1-Dec. 15	30	15	
Venezuela:				
Caracas	Dec. 4-17	13		Nov. 22-Dec. 3, 5 deaths.
La Guaira	Dec. 1-15	1	1	
Macuto	Dec. 1-7	1		
Maiquetia	Nov. 29	1		

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued

Reports Received from December 31, 1910, to January 20, 1911

PLAGUE

Place	Date	Cases	Deaths	Remarks
Brazil:				
Bahia	Nov. 28-Dec. 4	1	1	
Pernambuco	July 1-Oct. 15	.....	12	
Rio de Janeiro	Nov. 1-27	12	5	
China:				
Sioke	Dec. 6	.....	.....	Present; in the interior 60 miles from Amoy.
Ecuador:				
Guayaquil	Nov. 1-Dec. 15	147	63	
Egypt:				
Alexandria	Nov. 29-Dec. 24	5	2	
Provinces—				
Assiout	Dec. 1-29	50	24	
Galioubeeh	Nov. 22-Dec. 2	1	1	
Menouf	Dec. 2-22	26	14	
India:				
Bombay	Nov. 23-Dec. 13	.....	24	
Calcutta	Dec. 13-19	.....	20	
Kurrachee	Nov. 19-Dec. 10	17	16	
Rangoon	Nov. 20-Dec. 3	.....	7	
Bombay Presidency and Sind.	Oct. 29-Dec. 3	8,524	5,670	
Madras Presidency	Oct. 29-Dec. 3	2,267	1,805	
Bengal	Oct. 29-Dec. 3	2,328	1,626	
United Provinces	Oct. 29-Dec. 3	9,250	7,672	
Punjab	Oct. 29-Dec. 3	6,447	4,852	
Burma	Oct. 29-Dec. 3	380	335	
Central Provinces	Oct. 29-Dec. 3	5,153	3,999	
Coorg	Oct. 29-Nov. 5	10	3	
Mysore State	Oct. 29-Dec. 3	3,534	2,526	
Hyperabad State	Oct. 29-Dec. 3	2,073	1,675	
Central India	Oct. 29-Dec. 3	1,251	1,053	
Rajputana and Ajmer-Merwara.	Oct. 29-Dec. 3	4,211	3,148	
Kashmir	Nov. 6-Dec. 3	13	7	
Grand total	.....	45,441	34,371	
Indo-China:				
Saigon	Nov. 14-20	1	1	
Manchuria	.....	.....	.....	Total for Manchuria, Oct. 27-Dec. 26: Cases, 484 Chinese, 11 Russians; deaths, 484 Chinese, 10 Russians.
Buhedu	Oct. 30	3	3	
Chang Chuen	Dec. 7	.....	.....	Present.
Dalny	Jan. 11	2	.....	
Fuchiatien	Nov. 23	.....	16	
Hailar	Dec. 6	1	1	
Harbin	Nov. 21-Dec. 11	3	3	
Kirin	Dec. 7	.....	.....	Do.
Manchuria, station	Dec. 7-26	85	95	
Mukden	Dec. 7	.....	.....	Do.
Tchjalainarskiy	Nov. 11-Dec. 3	104	106	Cases previously reported, 14; deaths, 12.
Tchjalantum	Nov. 21-Dec. 3	3	2	
Turchiha	Oct. 30	4	4	
Mauritius	Sept. 30-Nov. 3	149	87	
New Caledonia:				
Noumea	Sept. 17	.....	.....	Present.
Peru	.....	.....	.....	Dec. 10, still present in Chicama Valley, near Truxillo.
Arequipa Department—				
Mollendo	.....	.....	.....	Nov. 16-29: Cases, 3; death, 1. Dec. 24: 2 cases in the lazaretto.
Callao Department—				
Callao	.....	.....	.....	Nov. 13-26: 1 case.
Lima Department—				
Lima	Nov. 27-Dec. 10	1	.....	
Russia:				
Astrakhan Government—				
Abil-Isken	Nov. 22-29	4	4	
Kirgis Steppe	Dec. 17	21	17	
Kulken Island	Oct. 13-Nov. 4	5	5	
Nauraali-Tchaygal	Nov. 23-29	5	5	
Neuren	Nov. 17-21	1	1	

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued

Reports Received from December 31, 1910, to January 28, 1911

PLAGUE—Continued

Place	Date	Cases	Deaths	Remarks
Russia—Continued.				
Trans-Caucasia				Total from Oct. 23-Nov. 24: Cases, 28; deaths, 5.
Petrovsk	Nov. 23	1	1	
Sanitza-Olivianna	Nov. 22	1	1	
Baku	Dec. 17	1	1	
Batum	Dec. 17	1	1	
Odessa	Nov. 26-Dec. 9		1	
Siam:				
Bangkok	Nov. 27-Dec. 3	1	1	
Straits Settlements:				
Singapore	Nov. 13-Dec. 3	1	1	
Venezuela:				
Caracas	Nov. 9			Present.

SMALLPOX

Abyssinia:				
Adis Ababa	Nov. 20-Dec. 17			Present.
Arabia:				
Aden	Jan. 9			Do.
Argentina:				
Buenos Aires	Oct. 1-31		6	
Rosario	Oct. 1-31		5	
Brazil:				
Bahia	Nov. 28-Dec. 4	13	8	
Para	Nov. 27-Dec. 10	12	2	
Pernambuco	July 1-Oct. 31		573	
Rio de Janeiro	Nov. 14-27	3		
Canada:				
British Columbia—				
Victoria	Dec. 11, 31	6		
New Brunswick—				
Newcastle	Dec. 18-Jan. 7	7		
Nova Scotia—				
Louisburg	Dec. 25-31	4		
Ontario—				
Cornwall	Jan. 1-7	1		
Ottawa	Dec. 18-31	3		
Ceylon:				
Colombo	Nov. 13-26	14	5	
Chile:				
Iquique	Nov. 13-19		1	
Talcahuano	Nov. 13-Dec. 3	16		
Valparaiso	Nov. 20-Dec. 3	217		
China:				
Chungking	Nov. 13-Dec. 3			Do.
Nanking	Nov. 20-Dec. 17			Do.
Shanghai	Nov. 21-Dec. 18	12	42	Deaths among natives.
Egypt:				
Alexandria	Nov. 1-30		1	
Cairo	Dec. 3-9	1		
France:				
Paris	Dec. 3-27	16		
Germany				Total for Germany, Dec. 24, cases 7.
Great Britain:				
Leith	Dec. 11-17	2		From a steamship from Oporto.
Hawaii:				
Honolulu	Jan. 3	3		On s. s. Kiho Maru from Manzanillo.
Puuene, Maui	Jan. 4-16	27		
India:				
Bombay	Dec. 6-13		2	
Calcutta	Nov. 6-12		1	
Madras	Nov. 20-Dec. 10	7	7	
Rangoon	Nov. 20-26		3	
Indo-China:				
Saigon	Nov. 14-Dec. 4	8	3	
Italy:				
Naples	Dec. 4-31	44	7	
Malta:				
Valetta	Dec. 4-17	2		
Manchuria:				
Dalny	Nov. 27-Dec. 3	1		

CHOLERA, YELLOW FEVER, PLAGUE, AND SMALLPOX—Continued

Reports Received from December 31, 1910, to January 20, 1911

SMALLPOX—Continued

Place	Date	Cases	Deaths	Remarks
Mexico:				
Monterey	Dec. 19–25	.....	1	
San Luis Potosi	Nov. 13–Dec. 3	14	6	
Tampico	Dec. 20–30	4	.....	
Portugal:				
Lisbon	Dec. 3–31	79	.....	Deaths, Oct. 30–Nov. 5, 10.
Russia:				
Libau	Dec. 5–25	3	3	
Moscow	Nov. 13–Dec. 24	28	8	
Odessa	Nov. 20–Dec. 3	4	.....	
Riga	Dec. 11–17	5	.....	
St. Petersburg	Nov. 13–Dec. 17	135	40	
Warsaw	Oct. 9–29	.....	9	
Spain:				
Barcelona	Dec. 5–11	.....	1	
Madrid	Nov. 1–30	.....	6	
Valencia	Nov. 27–Dec. 3	1	.....	
Straits Settlements:				
Penang	Nov. 6–Dec. 3	162	98	
Singapore	Nov. 13–Dec. 3	11	4	
Turkey:				
Constantinople	Dec. 19–25	.....	1	
Turkey in Asia:				
Beirut	Dec. 4–10	2	.....	
Uruguay:				
Montevideo	Oct. 1–31	4	1	
Zanzibar:				
Zanzibar	Oct. 31–Dec. 4	35	25	

MORTALITY

WEEKLY MORTALITY TABLE, FOREIGN AND INSULAR CITIES

Cities	Week ended—	Estimated population	Total deaths from all causes	Deaths from—									
				Tuberculosis	Plague	Cholera	Yellow fever	Smallpox	Typhus fever	Typhoid fever	Scarlet fever	Diphtheria	Measles	Whooping cough
Aberdeen	Dec. 24	185,703	39	....	....	....	....	....	....	....	1	....	....	1
Do	Dec. 31	.....	.....	....	....	....	....	....	....	....	1	1	....	....
Aix la Chapelle	Dec. 10	162,442	59	4	....	....	....	....	....	....	....	1	....	2
Amsterdam	Dec. 31	574,987	143	15	....	....	....	....	....	....	....	1	4	4
Athens	Dec. 20	175,430	46	9	....	....	....	....	....	1	....	....	....	....
Bahia	Nov. 4	173,879	100	14	1	....	....	8	....	....	....	....	....	....
Barmen	Dec. 10	169,000	52	3	....	....	....	....	....	....	....	2	1	1
Batavia	Dec. 3	217,630	.....	....	....	1	....	....	....	....	....	....	....	....
Beirut	Dec. 24	80,000	18	....	....	....	....	....	....	3	....	....	....	....
Belfast	...do....	391,167	132	18	....	....	....	....	....	....	1	....	1	1
Belgrade	...do....	80,000	46	....	....	....	....	....	....	1	....	1	....	....
Do	Dec. 31	.....	44	....	....	....	....	....	....	....	4	....	....	....
Birmingham	...do....	570,113	150	....	....	....	....	....	....	....	....	2	7	....
Bombay	Dec. 20	977,822	621	47	5	14	....	4	....	3	....	....	8	....
Bradford	Dec. 24	295,865	83	7	....	....	....	....	....	2	....	....	....	3
Do	Dec. 31	.....	75	2	....	....	....	....	....	....	....	2	....	3
Bremen	Dec. 24	246,827	77	7	....	....	....	....	....	....	2	....	....	....
Bristol	Dec. 31	382,550	93	5	....	....	....	....	....	....	....	....	....	2
Brussels	Dec. 24	562,895	188	13	....	....	....	....	....	4	....	3	....	....
Budapest	Dec. 17	950,610	.....	....	....	....	....	....	....	2	4	1	1	....
Cairo	Dec. 16	682,953	372	30	....	....	....	2	3	1	....	13	1	....
Do	Dec. 23	.....	426	34	....	....	....	....	4	4	....	11	....	....
Calcutta	Dec. 3	847,796	597	....	10	41	....	1	....	....	....	....	1	....
Catania	Dec. 24	210,000	80	5	....	....	....	....	....	1	....	....	....	....
Chemnitz	Dec. 17	286,455	103	12	....	....	....	....	....	....	1	1	1	1
Do	Dec. 24	.....	101	9	....	....	....	....	....	....	1	....	1	....
Ciudad Porfirio Diaz	Dec. 31	16,000	3	....	....	....	....	....	....	....	....	....	2	....
Do	Jan. 7	.....	10	....	....	....	....	....	....	....	....	....	3	....

MORTALITY—Continued

Weekly mortality table, foreign and insular cities—Continued

Cities	Week ended—	Estimated population	Total deaths from all causes	Deaths from—										
				Tuberculosis	Plague	Cholera	Yellow fever	Smallpox	Typhus fever	Typhoid fever	Scarlet fever	Diphtheria	Measles	Whooping cough
Cologne	Dec. 17	515,459	141	21	....	....	....	....	....	....	....	2	....	2
Do	Dec. 24	513,491	134	11	....	....	....	....	....	1	1	3	1	1
Colombo	Dec. 3	187,554	111	10	....	....	....	3	....	2	....	1	....	....
Do	Dec. 10	.....	127	15	....	....	....	1	....	6	....	....	....	....
Constantinople	Dec. 25	1,000,000	392	42	....	100	....	1	....	8	....	....	1	....
Copenhagen	Dec. 17	455,000	122	13	....	....	....	....	....	....	3	....	....	....
Dresden	...do	546,882	166	20	....	....	....	....	....	2	....	5	2	2
Do	Dec. 24	.....	159	25	....	....	....	....	....	....	1	3	5	....
Dublin	...do.....	402,928	178	26	....	....	....	....	....	1	....	2	....	5
Do	Dec. 31	.....	155	24	....	....	....	....	....	....	2	....	1	7
Dundee	...do.....	170,206	48	4	....	....	....	....	....	....	....	2	....	2
Edinburgh	...do.....	360,276	102	9	....	....	....	....	....	....	1	4	....	....
Frankfort on the Main	Dec. 17	414,406	101	....	....	....	....	....	....	....	....	1	3	2
Do	Dec. 24	.....	103	....	....	....	....	....	....	....	....	1	1	1
Georgetown	Dec. 10	56,000	81	5	....	....	....	....	....	1	....	....	....	....
Gibraltar	Dec. 25	23,915	7	....	....	....	....	....	....	1	....	....	....	....
Glasgow	Jan. 6	884,520	245	....	....	....	....	....	....	1	2	5	....	1
Kingston	Dec. 24	48,504	.....	....	....	....	....	....	....	1	....	....	....	....
Do	Dec. 31	.....	.....	....	....	....	....	....	....	1	....	....	....	....
Konigsberg	Dec. 24	249,308	80	7	....	....	....	....	....	....	....	....	....	1
Kurrachee	Dec. 17	130,000	86	....	19	....	....	....	....	....	....	....	....	....
Hamburg	Dec. 31	895,504	287	31	....	....	....	....	....	3	....	14	1	5
Hull	Dec. 24	280,006	69	....	....	....	....	....	....	1	....	....	1	2
Leeds	Dec. 31	490,985	122	7	....	....	....	....	....	1	....	2	7	1
Do	Jan. 7	.....	152	12	....	....	....	....	....	....	1	7	4	2
Leipzig	Dec. 24	585,743	190	25	....	....	....	....	....	....	....	1	5	5
Leith	Dec. 31	86,767	31	3	....	....	....	....	....	....	....	....	....	3
Liege	Dec. 24	176,796	46	5	....	....	....	....	....	1	....	....	1	....
Liverpool	Dec. 31	767,706	237	19	....	....	....	....	....	2	2	3	8	3
Do	Jan. 7	774,950	261	15	....	....	....	....	1	1	2	4	2	1
London	Dec. 24	7,537,196	1,877	....	....	....	....	....	....	8	4	20	111	25
Do	Dec. 31	.....	1,897	....	....	....	....	....	....	5	4	27	101	31
Lübec	...do.....	98,700	31	2	....	....	....	....	....	1	....	....	....	1
Lyons	Dec. 3	500,000	171	30	....	....	....	....	....	1	....	....	....	....
Do	Dec. 10	.....	168	21	....	....	....	....	....	....	....	....	....	....
Do	Dec. 17	.....	140	22	....	....	....	....	....	....	....	1	....	....
Madras	...do.....	550,000	411	....	1	....	....	3	....	....	....	....	2	....
Magdeburg	...do.....	279,644	104	8	....	....	....	....	....	....	....	....	....	....
Do	Dec. 24	.....	106	8	....	....	....	....	....	....	1	2	....	1
Manchester	Dec. 31	631,533	242	17	....	....	....	....	....	2	2	3	4	....
Mannheim	Dec. 10	198,604	41	3	....	....	....	....	....	....	....	....	2	....
Do	Dec. 17	.....	43	7	....	....	....	....	....	....	....	3	....	....
Mexico	Nov. 26	500,000	357	....	....	....	....	....	22	....	....	....	....	....
Do	Dec. 3	.....	327	....	....	....	....	....	24	....	....	....	....	1
Do	Dec. 10	.....	377	....	....	....	....	....	31	....	....	....	....	....
Do	Dec. 17	.....	403	....	....	....	....	....	29	....	....	....	....	1
Moncton	Jan. 14	13,500	4	....	....	....	....	....	....	....	....	2	....	....
Montreal	...do.....	450,000	185	18	....	....	....	....	....	1	6	12	....	1
Monterey	Jan. 8	100,000	47	6	....	....	....	....	....	1	....	....	....	....
Newcastle-on-Tyne	Dec. 31	285,891	103	....	....	....	....	....	....	....	....	2	3	7
Nottingham	Dec. 24	263,000	79	....	....	....	....	....	....	....	....	....	1	....
Do	Dec. 31	.....	71	....	....	....	....	....	....	....	....	....	....	1
Odessa	Dec. 17	546,000	189	31	....	....	....	....	....	1	16	4	....	1
Palermo	Dec. 31	340,000	175	9	....	1	....	....	1	....	6	1	....	....
Paris	Dec. 24	2,776,399	891	188	....	....	....	....	....	4	1	3	4	3
Penang	Dec. 3	103,582	90	11	....	....	....	10	....	....	....	....	....	....
Piraeus	Dec. 25	74,580	26	3	....	....	....	....	....	3	....	....	....	....
Plymouth	Jan. 7	124,180	46	....	....	....	....	....	....	....	....	2	2	....
Port of Spain	Dec. 31	60,000	28	3	....	....	....	....	....	2	....	....	....	....
Port Said	Dec. 16	52,811	20	1	....	....	....	....	....	....	....	1	....	....
Do	Dec. 23	.....	22	3	....	....	....	....	....	....	....	2	....	....
Prague	Dec. 17	235,556	67	12	....	....	....	....	....	....	1	....	....	....
Rangoon	Dec. 10	252,155	156	....	4	....	....	2	....	....	....	....	....	....
Rotterdam	Dec. 17	426,281	112	....	....	....	....	....	....	....	1	1	....	....
Saigon	Nov. 27	206,000	1	....	....	....	....	1	....	....	....	....	....	....
St. Johns	Jan. 7	31,000	.....	....	....	....	....	....	1	....	....	....	....	....
St. Petersburg	Dec. 24	1,678,000	821	119	....	....	....	7	1	13	18	10	7	3
Saloniki	Dec. 31	200,000	.....	....	....	1	....	....	....	....	....	....	....	....
Sao Paulo	Oct. 9	314,000	154	11	....	....	....	....	....	....	....	....	6	1
Do	Oct. 23	.....	153	10	....	....	....	....	....	....	....	....	3	....

MORTALITY—Continued

Weekly mortality table, foreign and insular cities—Continued

Cities	Week ended—	Estimated population	Total deaths from all causes	Deaths from—										
				Tuberculosis	Plague	Cholera	Yellow fever	Smallpox	Typhus fever	Typhoid fever	Scarlet fever	Diphtheria	Measles	Whooping cough
Sao Paulo	Oct. 30		174	13	....	....	....	....	....	....	....	....	1	....
Sarnia	Jan. 14	9,810	5	....	....	....	....	....	....	1	....	....	....	....
Singapore	Dec. 3	271,060	208	37	....	....	....	1	....	1	....	....	....	....
Southampton	Dec. 24	127,157	32	2	....	....	....	....	....	....	....	1	2	....
Do	Jan. 7		32	4	....	....	....	....	....	....	....	....	1	....
Stettin	Dec. 17	234,033	86	7	....	....	....	....	....	....	....	4	....	....
Do	Dec. 24		74	7	....	....	....	....	....	1	2	....	....	....
Stockholm	Dec. 17	341,816	92	15	....	....	....	....	....	1	....	3	....	....
Do	Dec. 24		83	9	....	....	....	....	....	....	1	1	....	....
Sydney	Jan. 7	16,000	6	....	....	....	....	....	....	....	....	1	....	....
Talcahuana	Dec. 17	28,000	....	....	....	....	....	....	....	....	....	....	....	3
Trebizond	..do	55,000	....	....	....	2	....	....	....	....	....	....	....	....
Trieste	..do	223,521	93	....	....	....	....	....	....	1	....	1	2	....
Turin	Dec. 22	391,988	127	16	....	....	....	....	....	....	1	....	....	....
Valencia	Dec. 24	240,000	107	9	....	....	....	....	....	....	....	3	1	....
Do	Dec. 31		128	8	....	....	....	....	....	4	....	....	....	....
Venice	Nov. 26	183,224	72	6	....	....	....	....	....	1	....	2	1	....
Do	Dec. 3		78	8	....	....	....	....	....	2	....	1	....	....
Do	Dec. 17		55	4	....	....	....	....	....	1	....	....	....	....
Veracruz	Dec. 31	32,000	43	8	....	....	....	....	....	....	1	....	....	....
Victoria	Jan. 7	40,000	6	1	....	....	....	....	....	....	....	....	....	1
Vienna	Dec. 10	2,130,320	648	96	....	....	....	....	....	1	5	5	16	....
Winnipeg	Jan. 14	135,000	25	2	....	....	....	....	....	....	6	....	....	....
Yokohama	Dec. 19	407,432	....	....	....	....	....	....	....	1	....	3	....	....
Do	Dec. 26		....	....	....	....	....	....	....	1	....	2	....	....

MORTALITY—FOREIGN AND INSULAR—COUNTRIES AND CITIES (untabulated)

AUSTRALIA—*New Castle.*—Month of November, 1910. Population, 55,500. Total number of deaths from all causes 50, including typhoid fever 2, measles 1.

CANADA—*Dawson.*—Month of November, 1910. Population, 5,000. Total number of deaths from all causes 3, including tuberculosis 1.

Sherbrooke.—Month of December, 1910. Population, 15,300. Total number of deaths from all causes 17, including diphtheria 1, tuberculosis 2.

CURACAO.—Two weeks ended December 30, 1910. Population, 31,400. Total number of deaths from all causes 16. No contagious diseases reported.

EAST AFRICA—*Lourenzo Marquez.*—Month of November, 1910. Population 10,000. Total number of deaths from all causes 43, including tuberculosis 6.

FRANCE—*Calais.*—Month of December, 1910. Population, 80,000. Total number of deaths from all causes 122, including diphtheria 2, tuberculosis 18.

GREAT BRITAIN.—Week ended December 17, 1910:

England and Wales.—The deaths registered in 77 great towns correspond to an annual rate of 15.2 per 1,000 of the population, which is estimated at 16,940,895.

Ireland.—The deaths registered in 21 principal town districts correspond to an annual rate of 19.6 per 1,000 of the population, which is estimated at 1,151,790. The lowest rate was recorded at Dundalk, viz 8, and the highest at Lurgan, viz 48.7 per 1,000.

Scotland.—The deaths registered in 8 principal towns correspond to an annual rate of 16.5 per 1,000 of the population, which is estimated at 1,891,936. The lowest rate was recorded at Paisley, viz, 11.3, and the highest at Dundee, viz, 17.8 per 1,000. The total number of deaths from all causes was 598, including measles 2, scarlet fever 7, diphtheria 18.

Week ended December 24, 1910:

England and Wales.—The deaths registered in 77 great towns correspond to an annual rate of 14.2 per 1,000 of the population, which is estimated at 16,940,895.

Ireland.—The deaths registered in 21 principal town districts correspond to an annual rate of 19.1 per 1,000 of the population, which is estimated at 1,151,790. The lowest rate was recorded at Sligo, viz, 4.8, and the highest at Lurgan, viz, 35.4 per 1,000.

Scotland.—The deaths registered in 8 principal towns correspond to an annual rate of 13.4 per 1,000 of the population, which is estimated at 1,891,936. The lowest rate was recorded at Perth, viz, 19.6, and the highest at Dundee, viz, 20.8 per 1,000 of the population. The total number of deaths from all causes was 486, including typhoid fever 1, scarlet fever 6, diphtheria 10.

GUADELOUPE.—Four weeks ended December 31, 1910. Population 8,656. Total number of deaths from all causes 12. No contagious diseases reported.

MALTA.—Three weeks ended December 23, 1910. Population 215,879. Total number of deaths from all causes 265, including typhoid fever 3, tuberculosis 11.

MARTINIQUE—*Fort de France.*—Two weeks ended December 17, 1910. Population 27,019. Total number of deaths from all causes 53. No contagious diseases reported.

NEW ZEALAND.—Month of October, 1910:

Auckland.—Population 97,929. Total number of deaths 69, including typhoid fever 1, tuberculosis 3.

Christchurch.—Population 78,605. Total number of deaths 48, including scarlet fever 1, tuberculosis 4.

Dunedin.—Population 62,584. Total number of deaths 52, including tuberculosis 10.

Wellington.—Total number of deaths 44, including diphtheria 2, tuberculosis 4.

PORTO RICO.—Month of September, 1910. Population, 1,118,012. Total number of deaths from all causes 2,179, including typhoid fever 30, measles 16, diphtheria 1, tuberculosis 205.

Month of October, 1910. Total number of deaths 2,192, including typhoid fever 25, measles 3, diphtheria 6, tuberculosis 207. The number of cases admitted for treatment for anemia at the dispensaries of the service of tropical and transmissible diseases was, during the months of September and October, 1910, 4,173, of which number 1,268 were cured and 1 ended fatally.

SIAM—*Bangkok.*—Four weeks ended December 3, 1910. Population, 600,000. Total number of deaths from all causes not reported. The deaths include cholera 131, plague 1.

SIERRA LEONE.—Month of November, 1910. Population, 40,000. Total number of deaths from all causes 77. No contagious diseases reported.

TAHITI.—Two weeks ended December 23, 1910. Population, 4,000. Total number of deaths from all causes 2. No deaths from contagious diseases.

TASMANIA—*Hobart.*—Month of November, 1910. Population, 186,860. Total number of deaths from all causes 153, including typhoid fever 1, scarlet fever 1, diphtheria 1, tuberculosis 8.

TURKEY—*Saloniki.*—Month of November, 1910. Population, 200,000. Total number of deaths from all causes 158, including typhoid fever 4, cholera 4, diphtheria 1, tuberculosis 25.

By authority of the Secretary of the Treasury:

WALTER WYMAN,
Surgeon General,
United States Public Health and Marine-Hospital Service.