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THE EPIDEMIOLOGY OF UNDULANT (MALTA) FEVER IN IOWA

(Preliminary Report)

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It was pointed out in a previous paper (1) that, through the routine examination of blood specimens sent for Widal tests, a number of cases of undulant fever were being diagnosed. It was also mentioned that epidemiological investigations were being carried out and clinical data were being accumulated. A preliminary report (2) of the clinical findings has already been made and a detailed analysis will follow at a later date. In presenting this paper on the epidemiology of undulant fever it is appreciated that fixed conclusions must not yet be formed, but it is hoped that the findings may serve both as a guide and a stimulus for more extensive studies.

Accuracy of diagnoses.—In analyzing cases one is first confronted with the question of the accuracy of the diagnoses. Among the cases here presented there is none in which there were findings sufficient to establish any primary diagnosis other than undulant fever, and this diagnosis was substantiated by clinical, serological, and bacteriological evidence. The findings may be briefly summarized:

Clinical: There was a marked variation in symptomatology and physical findings, as is characteristic of this disease. The onset was commonly insidious, but in a few instances was sudden. Weakness was the first symptom usually, and the only constant one. Profuse night sweats were the most striking feature, although these were not always present. Sensations of chilliness were common, and rigors occurred in the severe cases. General aching, backache, headache, and arthralgia accounted for most of the pain. Anorexia, succeeded by a good appetite, even with fever, was common. Constipation was the rule. Insomnia, irritability, and apprehension were the usual nervous disturbances. A secondary bronchitis sometimes occurred. The patients often did not feel ill when at rest and did not look ill. In more than half of the cases no abnormal physical findings were detected, but a palpable spleen and epigastric tenderness were often noted. The temperature was irregular and intermittent, usually

with morning remissions, often to normal. In less than one-third of the cases were there known undulations with periods of apyrexia. The total white-blood count tended toward a slight leucopenia; the differential usually showed a decrease in polymorphonuclears with a corresponding increase in mononuclears. The course, which covered a period of three weeks to nine months, was marked by a progressive loss of weight and an anemia. Arthritis, orchitis, mastitis, and cardiac disturbances were the complications observed, but were not of frequent occurrence. The cases varied in severity from an ambulatory to a malignant type; but the intermittent with relatively mild but persistent symptoms were common.

Serological: No case is included in which an agglutination of *Br. melitensis* in a titer of at least 1:80 was not obtained. Of the 83 cases studied, a higher titer than this was obtained in 78 (94 per cent). In 46 cases (55 per cent) there was complete agglutination in a serum dilution of 1:1280 or higher, while in 9 cases (11 per cent) there was complete agglutination in the 1:5120 dilution. On the average, 2.75 agglutination tests have been done on accepted cases. The agglutinins have repeatedly been observed to increase during the course of the disease and slowly to decrease following convalescence.

Bacteriological: Bacteriological study could be made on only a few cases. *Br. melitensis* was, however, isolated from the blood of nine patients; and from five of the seven patients studied in hospital the cultures were positive.

On the basis of this clinical, serological, and bacteriological evidence, therefore, it is felt that there can be little possibility of error in the diagnoses.

In 78 of the 83 cases here reported, an epidemiological study was made by the writer; in the remaining 5 cases reports were received from the attending physician. The data may be presented under the following headings:

Prevalence.—Up to June 30, 1928, the diagnosis of undulant fever in Iowa has been established in 83 cases. All but three of these have occurred since July 1, 1927. During April, May, and June, 1928, 30 cases were diagnosed. This can not be accepted as a true indication of the number which have occurred. It has frequently happened that a confirmed diagnosis on one case has been followed by the recognition of other cases in the same vicinity or the establishment of the diagnosis on some perplexing case which occurred even months before.

A comparison of the results of the agglutination tests performed in the State laboratory for typhoid, paratyphoid, and undulant fever is enlightening. This comparison up to December 1, 1927, has been reported (1). From that date until June 30, 1928, 1,120 tests for both typhoid and undulant fever have been made, paratyphoid

examinations being performed only on request. From this number there were 50 positive reports for typhoid or paratyphoid from 47 patients, while there were 126 positive reports for undulant fever from 74 patients, including repeated tests on 21 previously diagnosed cases. It may be noted that in undulant fever a test on a dried blood specimen alone is never recorded as positive, even though there is complete agglutination, with large clumps, in the 1:80 dilution. In typhoid, however, positive reports are made on the dried blood specimens. Since clinical records concerning the latter are not available, there is a probability of error in accepting the laboratory evidence as really indicating 47 cases of typhoid or paratyphoid, and this probability is greater because of the fact that the tests were so rarely repeated. Fifty-one diagnoses of undulant fever were, however,

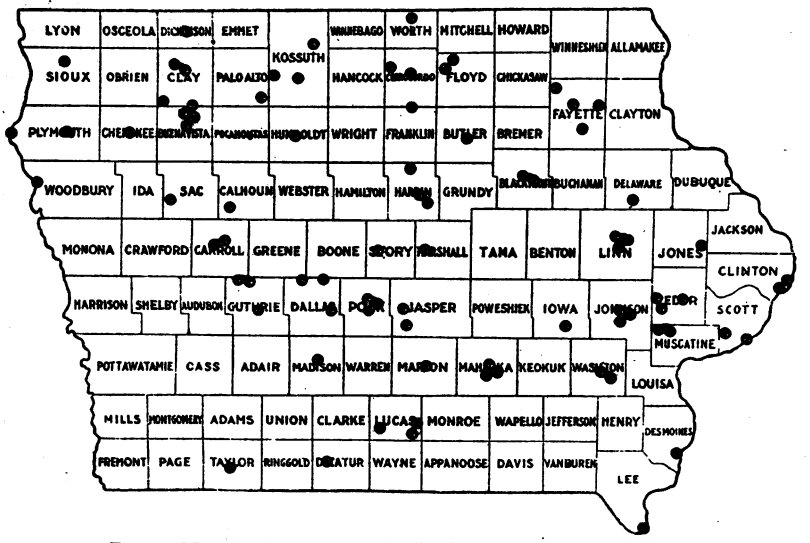

FIG. 1.—Map showing scattered distribution of undulant fever in Iowa

definitely established during the same period. These figures can be used for comparative purposes only. They do not correspond with the number of cases of typhoid fever actually occurring in the State, and it may be assumed that there is a similar discrepancy in regard to undulant fever. This reaffirms the earlier impression that undulant fever in Iowa is as prevalent as typhoid and paratyphoid combined, or more so.

Distribution.—The cases occurred sporadically and were widely scattered. This is shown on the map in Figure 1. The multiple cases in one locality are probably largely explained by a greater accuracy in diagnosis. In two instances two cases occurred in one family. In a third, a farmer and farm employee who worked together but lived separately both acquired the infection. Eighteen other cases were recognized by nine physicians, while one general prac-

titioner, with largely a country practice, has to his credit four accepted cases and a suspicious fifth, all found within seven months. In most, if not all, of these instances the diagnosis of the first case led to the recognition of subsequent cases.

Forty-six of the patients lived on the farm, 7 in towns of less than 1,000, and 12 in towns with a population between 1,000 and 5,000. Of the remaining 18 cases, 7 lived in cities of more than 50,000 population.

Occupation.—Sixteen occupational groups were included. Thirty-nine were farmers. This number included 30 farm operators, 5 farmers' sons, and 4 farm laborers, unmarried and living with the farmer employing them. There were 6 farmers' wives and 1 farmer's daughter. Among the employees of 5 packing houses in as many cities, 6 cases occurred. There were 10 housewives not living on a farm, 4 students, 3 mechanics, and 2 insurance agents. The remaining number included the dean of a college of law, a physician, an attorney, a nurse, a druggist, a veterinarian, a merchant, a bookbinder, a buttermaker, a worker in an ice-cream plant, a fisherman, and an imbecile.

Sex.—There were 63 males and 20 females. If from the total number, however, one selects the 25 cases that had no contact with livestock, except through dairy and food products, one finds 13 males and 12 females.

Age.—Two cases only were under 13 years of age—a boy of 7 and a girl of 8. The oldest patient was 73 years of age. The distribution by age is shown in Table 1. The infrequence of discovered cases in the young and the large number of males in the age group 20 to 49 is most striking. The absence of such a grouping in those who had no contact with stock is apparent.

Travel.—In only five cases had the patient taken any but local trips within one year. In no case had they been traveling in Southern States or foreign countries within recent years. With three exceptions, the infection was clearly acquired within the State.

TABLE 1.—*Distribution of cases of undulant (Malta) fever in Iowa, by sex and age of patient*

Age	All cases			Cases having no contact with livestock		
	Total	Male	Female	Total	Male	Female
0-4	0	0	0	0	0	0
5-9	2	1	1	0	0	0
10-14	4	4	0	0	0	0
15-19	2	2	0	1	1	0
20-29	19	17	2	4	3	1
30-39	22	16	6	5	3	2
40-49	18	13	5	5	1	4
50-59	9	5	4	6	3	3
60-69	4	3	1	2	1	1
70+	2	1	1	2	1	1
Unknown	1	1	0	0	0	0
	83	63	20	25	13	12

Diet.—In the investigation attention was given to the consumption of dairy products and meats. The amount and kind of milk and cream used and the findings with regard to the dairy herds will be stated in the following paragraphs. The butter, with few exceptions, was made in local creameries from Pasteurized cream. Many varieties of cheese were used. Careful inquiries were made as to imported cheese, and in no instance was there a history of this being used during one year prior to the onset of the patient's illness. The meats included in the diet varied in no notable way from those used by the average person.

Source of the infection.—The sources which were considered were man himself and cattle, hogs, goats, sheep, and horses. There is no evidence which suggests that any of the cases were acquired from goats, sheep, or horses. Very few goats are kept in the State—so few that in the census record they are included with the sheep. In only two cases had there been even remote contact with goats. In one case a goat had been kept on the farm, but was sold a year prior to the onset of the patient's illness. In the other case the patient was a nurse who kept her car in a garage on a farm on which several goats were kept. She did not go near the animals and never used goat's milk. In all other cases no record could be obtained of any contact with goats or goat products. Sheep are not commonly kept by Iowa farmers; and in the few cases in which there were some on the farm the animals were apparently healthy. In no case had there been contact with a horse which had aborted. Negative evidence, therefore, suggests that if the infection were acquired from animals the source would be found in cattle or hogs, or in both. In only one patient does it appear that the infection was derived from a human case. According to the probable source of the infection the cases may be grouped and further analyzed.

There are, first, 52 cases in which the evidence indicates that the infection was acquired from cattle. This evidence includes the history of dairy herds, serological examination of cattle, and the absence of any other probable source. In obtaining the history of the dairy herd attention was given to abortions, retained placentas, and sterility. One or more of these conditions occurring in several animals in one year, or repeatedly for a period of years, was regarded as presumptive evidence of the presence of infection with *Br. melitensis*. Any history of even one of the three conditions was regarded as suggestive. Blood examinations were recommended, when practicable, but in questionable cases they were urged. With sterile tubes and needles such as are ordinarily found in Wassermann outfits, and with assistants holding the animal and constricting the vessels, the blood is easily withdrawn from the jugular vein. The agglutination tests were performed using the *Br. melitensis* variety *abortus* antigen, and

the same technique was used as that employed with human sera. In 49 cases the patient had clearly been exposed to cattle with contagious abortion or products of such cattle; in the remaining three, raw milk was used. In all cases other possible sources were apparently absent.

The findings made in the study of the cattle suspected of being the source of these infections were as follows: In 21 cases presumptive or suggestive histories of contagious abortion were given and confirmatory serological evidence was obtained. In two instances not even a suggestive history was elicited, but sera gave strong agglutination reaction. Another case was in a veterinarian who used raw milk, but who also was treating several herds of cattle for contagious abortion. As far as he knew he was caring for no other stock with the same infection. In eight additional cases it was clearly evident that the condition of contagious abortion was present in the herds, but serological examinations were not done. In 18 cases the milk was regularly purchased from a public dairy supplying raw milk, while in 2 cases pasteurized milk was ordinarily used, but extra supplies of raw milk were purchased from local stores. Serological tests were not practicable where public dairies received milk from several producers. Histories of the herds, however, were procured from the dairyman, local veterinarian, or herd owner, and in 15 instances the infection was known to be present in some of the herds.

An average of slightly more than 1 pint of milk a day was used by these patients.

The following cases in this group may be briefly cited as illustrative or particularly conclusive:

O. P. Farm laborer's wife, living in country. Patient overworked. For three months prior to onset had only one meal away from home and at that meal used no milk. The only stock kept was one cow, two gelding horses, and chickens. Only 3 pounds of butter were bought in four months prior to onset of illness. No cheese was used. Milk formed a most important part of the family's diet, but was used no more freely by the patient than by others. The cow, recently purchased, was thought to be healthy, but its blood completely agglutinated *Br. melitensis* in a 1:1,280 dilution. The animal was later sold because of sterility.

F. K. Farmer's son. A diabetic, using some milk, but cream very freely. Five of seven cows aborted in past year. Sera of four of the seven cows were found at the State Veterinary College to agglutinate in dilutions higher than 1:80, a maximum titer of 1:12,000 being obtained in one case. No abortion among hogs. No sheep kept on farm. Patient assisted in caring for cattle.

J. V. Farmer. Uses milk freely. Suggestive history of contagious abortion in herd. Five of six cattle positive serologically, three in titers of 1:1,280 or higher.

M. H. Housewife. Gastric ulcer diagnosed and Sippy diet given. Fever began while on diet. Raw milk from public dairy used. Clear history of contagious abortion in one herd.

C. D. H. and A. C. C. D. H., an insurance agent, living in a town of 1,000 population. Being treated for hypertension. Developed undulant fever in November, 1927. Used an average of 1 pint of milk a day purchased from a dairymen owning his own herd. A majority of the cattle were recently purchased. No history of abortions or retained placentas, but four were sterile. Three had been sold. One such animal examined showed no agglutination above 1:20 dilution. A. C., using an equal amount of milk from the same herd, became ill in March. The cattle were then examined serologically and 11 of 19 were found to agglutinate *Br. melitensis* in a 1:80 dilution or higher. Eight gave complete agglutination in 1:640 dilution or higher. Three cows have since aborted. At the State Veterinary College *Br. melitensis* has been cultured from the milk of one of the cows.

G. B. College professor's wife living in city of over 50,000. Within year traveled only to Detroit. No contact with animals. Uses less than 1 pint of milk daily, purchased from a store selling both the Pasteurized and unpasteurized milk. The latter was obtained regularly. Clear history of contagious abortion in herds supplying milk.

W. G. A bookbinder living in city of 15,000. For several years no contact with domestic stock. Uses an average of 1 quart of unpasteurized milk daily, supplied by a dairy herd considered to be one of the best. No history of abortions. One animal had a retained placenta. Serologically one agglutinated in 1:1,280 dilution and two in 1:160. The remaining 12 cattle showed no agglutination above 1:20 dilution.

A second group includes 11 cases in which the evidence indicates that the infections were acquired from hogs. Less milk was used by the members of this whole group than by Group I, the average daily amount being 0.3 pint. In these cases there was knowledge of repeated contact with infected hogs or pork and satisfactory evidence which freed the cattle from suspicion. There are in this group five packing-house workers and six farmers. The packing-house workers all used Pasteurized milk, though one of them occasionally obtained raw milk from a herd with no history of contagious abortion. All worked only with hogs and three handled uteri. The infected farmers all had cattle which were, by history, free from infection, and in the five herds examined serological tests were negative, whereas in all instances there was a clear history of contagious abortion among the hogs, substantiated in four cases by serological findings. Blood was obtained from these animals by securing them in a "hog ring" and bleeding from the tip of the tail.

The following histories will clarify and emphasize the above evidence:

F. D. C. Packing-house worker. Used Pasteurized milk and creamery butter. No contact with cattle either living or dead. Duties consisted in freeing the rectum and removing the uterus. He handled in this way over 1,000 hogs each day. Hands cut or scratched continually.

B. H. Packing-house worker. Used Pasteurized milk and creamery butter. Duties consisted in washing contents from intestines. Stated that uterus was frequently attached. Cuts or abrasions were not obtained in work.

E. P. and H. P. A farmer and his son. Cattle free of infection historically and serologically. Several abortions and much sterility among hogs. Serologically 8 of 13 were positive. Father, E. P., cared for hogs until his sickness, which began in March. From that date his son did this work. Two months later H. P. became ill. Precautions with excreta of father were taken and the son did not assist in caring for him. E. P. and H. P. probably acquired infection from the same source.

H. A. Farmer. Used little milk or butter. Cattle clear of infection both historically and serologically. Twenty of twenty-one hogs had aborted. Thirteen which had not been sold were positive serologically.

There are in a third group four cases in which there was a known possible source found in both cattle and hogs. One is a packing-house worker who used Pasteurized milk and in his work was exposed to the edible and inedible waste from cattle and hogs. The remaining three are farmers. A history of contagious abortion among both cattle and hogs was given. Serological examinations were done in only one instance in which the history was not clear, and here both cattle and hogs gave positive reactions. Two of the farmers used dairy products freely and the other sparingly.

In one case the evidence strongly suggests that the infection was secondary to a previous human case. The history of this case is as follows:

L. H. Housewife, living in city of 35,000. Husband ill with undulant fever during January and February, being bedfast during the last three weeks of February and convalescing during March. On March 12 patient became ill. Onset was sudden. Pasteurized milk was delivered daily to the home, but, occasionally extra amounts of raw milk were purchased. With this exception the only other known source of infection was patient's husband. Patient acted as nurse and disinfecting precautions were not carefully observed.

The chronological relation to husband's illness and the intimate contact suggest strongly but do not prove that this case was secondary to another human case. This patient was one of the two fatalities which have occurred.

There are 15 cases in which clear evidence of the source of the infection was not obtained, though in all cases there had been contact with cattle or hogs or the free use of raw milk. In three cases the source could not be studied, since the patients had traveled extensively within three months prior to the onset of the infection. The remaining 12 cases include 9 farmers, 1 miller and hog raiser, 1 farmer's wife, and 1 laborer's wife living in the country. With the exception of the last case, raw milk had been used and there had been intimate contact with cattle or hogs. In only 4 of the 12 cases were serological examinations of the herds made. One of these showed reactors, but the history of the hogs on this farm is unknown. The other three herds showed no reactors. The absence of laboratory findings in those cases in which there was no history of contagious abortion may ex-

plain the failure to detect the source of infection in these cases. Four cases among farmers are of particular interest; three used dairy products, sparingly, but all handled large numbers of both cattle and hogs. The average quantity of milk used by the patients in this group was 0.7 pint daily.

The following cases are of particular interest:

M. C. and P. G. A farm operator and farm laborer working on same farm, but living separately. The former was ill from April to August 1, with recurrences in September and December. The latter became ill in August. Milk, supplied by same herd, which was free from infection, both historically and serologically, was used sparingly by both. A large number of cattle and hogs were cared for by these men.

Mode of transfer.—The mode of transfer of the organism from the infected animal to man is a matter of great importance. In the 25 cases in which there had been no direct contact with livestock the evidence suggests that the organism was transmitted through raw milk or cream. It may be accepted also that, in the case of the packing-house workers, the organism was acquired either from infected meat or the excreta and gained entrance through the injured or unbroken skin, or by way of the digestive tract. The same would hold true for the other cases in which the infection was acquired from hogs. In the remaining cases, however, there are two possible modes of transfer, either in dairy products used as food or by contamination with infectious excreta from livestock. In these it is impossible to determine which mode was effective. Some idea of the relative frequency of the various modes of transfer may be deduced from the occupation and sex of the persons infected. It may be assumed that, when equally exposed, males and females are equally susceptible. Among the adults living on the farm there were, however, 39 males and 6 females. Six of the male cases are accepted as having derived their infection from hogs. The amount of milk ingested by the remaining 33 men was not notably in excess of the amount taken by the average farmer's wife. The difference in diet is certainly not enough to account for the preponderance in the number of males. With farmers' wives the possibility of the infection being acquired by direct contact with stock must be recognized; but assuming that all are explained by the ingestion of the organism with dairy products, it would then be improbable that more than 10 farmers would be similarly infected. A mode of transfer other than through dairy products used as food must, therefore, be assumed; and it is evident that those working around stock are exposed more dangerously than those using the same dairy products as food but not working with stock. This is further emphasized by the group of cases in which the farmers used milk and dairy products sparingly, but worked with infected stock. Of the cases which we have investi-

gated it is impossible to state what proportion were transferred through the medium of milk. It seems evident, however, that a goodly proportion of the infections were acquired from contamination by animal body discharges. The possibility that the organism may gain entrance through the skin, either abraded or apparently normal, must be recognized.

DISCUSSION

A comparison of our findings with those of Madsen (3), of Denmark, gives added force to certain points. During one year, in Denmark, 2,500 samples of blood sent for Widal tests were examined routinely, using *B. typhosus*, *paratyphosus* B, and *Br. melitensis* var. *abortus*. In 222 cases agglutination of *Br. melitensis* was obtained in a 1:100 dilution or higher, while at the same time there were 172 positive tests with *B. typhosus*, and 126 with *B. paratyphosus* B. The infection occurred sporadically. Of 209 cases, 145 lived in rural districts, and of these 122 were males; 64 lived in towns or cities, and of these 38 were males. In 68 there was exposure only through milk, in 60 to cattle and milk, and in 43 to cattle only. The source of the remaining number of infections was considered as uncertain. No patient was under 8 years of age. Among the males the disease was most common in the age group 15 to 40, but among females there was no characteristic age distribution. Hogs were not mentioned as a possible source, and none of the cases could be traced to goats.

The age distribution in both series of cases is most interesting and may possibly serve to explain the apparently high immunity which there is to this organism. Obviously children under 7 are frequently exposed to this infection through milk. During the early years of life may it not be that an immunity is acquired either without apparent disease or through a mild infection, the cause of which is not recognized? Whether the determining factor lies here or in the type or dosage of the organism to which the individual is exposed has yet to be more fully studied. Table 1 agrees with Madsen's findings in apparently demonstrating that the highest incidence occurred among men in age groups which were most exposed to livestock.

It seems from the evidence that the infection in only some of the cases is transmitted through the medium of milk. This but serves to emphasize the fact that this disease can not be controlled entirely through the pasteurization of milk, though undoubtedly such a procedure would aid in control. The prevention of undulant fever, occurring largely on the farms, in small towns, or among packing-house workers evidently will be dependent upon the control of the infection in animals and precautions on the part of those handling infected stock.

The cases contracted by workers in packing houses call for special mention. The infection in these instances is clearly an occupational disease. The patients have been unable to work for a period varying from one month to five months. For compensation to be obtained by the workmen, it must be recognized that undulant fever among packing-house workers is an occupational disease.

The examination of milk has not been undertaken, and it is known that not all cattle with blood-stream agglutinins have organisms in the milk. In the future it is planned to do agglutination tests on milk and, where possible, parallel these with bacteriological studies.

The grouping of the organisms isolated from the patients has yet to be done. The possibility that different types of organisms will be isolated from one species of animal is apparent. Bacteriological classifications will be helpful; but, in determining the source of the infections, epidemiological field investigations give promise of more accurate information.

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(1) Hardy: Public Health Reports (1928), vol. 43, No. 9, pp. 503–511.
(2) Hardy: Jour. Iowa State Medical Society. (In press.)
(3) Madsen: Epidemiological Report No. 114, May 15, 1928, issued by the Health Section of the Secretariat of the League of Nations.

MORTALITY IN CERTAIN STATES, 1923–1927 [1]

The accompanying summary table (Table 1), giving mortality rates from certain causes in a group of States in 1927 and the four preceding years, has been compiled from statistics of deaths furnished by the respective State health departments. Although the data from the various States are not always absolutely comparable, because of slight differences in the procedure of classifying deaths according to cause, they are sufficiently so for practical purposes. Until the tabulations for States in the birth and death registration areas are completed by the Bureau of the Census, these rates may be regarded as fairly accurate provisional rates for a considerable sample of our population. Data for additional States are being made available, and the table includes only those States from which reports had been received up to the time it was completed.

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

TABLE 1.—*Mortality from certain causes in 1923–1927 in a group of States*

International List No.	Disease	1927	1926	1925	1924	1923	States included	Population estimated as of July 1, 1927
1–205	All causes—Rate per 1,000.	9.6	10.4	10.0	9.9	10.6	Connecticut, Michigan, Minnesota, Montana, Nebraska, New York,[1] Ohio, Pennsylvania, Virginia, Wisconsin.	44,084,000
	Infant mortality—Rate per 1,000 live births.	64.9	75.2	74.1	------	------	Connecticut, Minnesota, Montana, Nebraska, New Jersey, New York,[1] Pennsylvania, Virginia.	33,715,000
	------do------	61.9	70.7	69.4	67.8	73.4	Connecticut, Minnesota, Montana, Nebraska, New Jersey, New York,[1] Virginia.	23,985,000
		Rate per 100,000						
1	Typhoid fever	2.2	3.1	3.8	2.8	3.7	Connecticut, Minnesota, Montana, Nebraska, New York,[1] Ohio, Pennsylvania, Virginia, Wisconsin.	39,549,000
7	Measles	2.0	7.1	2.4	3.5	10.3		
8	Scarlet fever	1.8	2.3	2.8	3.5	4.1		
9	Whooping cough	4.1	7.3	4.9	6.2	7.3		
10	Diphtheria	4.9	5.6	6.7	7.4	10.3		
11	Influenza	18.8	32.4	22.4	15.3	34.7	Connecticut, Minnesota, New York,[1] Ohio, Pennsylvania, Virginia, Wisconsin.	37,649,000
22	Acute anterior poliomyelitis.	1.25	0.82	1.55	0.88	0.65	Connecticut, Minnesota, Nebraska, New York,[1] Ohio, Virginia.	26,397,000
24	Meningococcus meningitis.	0.80	0.58	0.73	0.68	0.99	Connecticut, Minnesota, New York,[1] Ohio, Virginia.	25,001,000
31–37	Tuberculosis, all forms.	57.9	63.7	64.0	66.9	70.9	Connecticut, Kansas, Minnesota, Montana, Nebraska, New York,[1] Ohio, Pennsylvania, Virginia, Wisconsin.	41,422,000
43–49	Cancer	84.5	84.2	81.7	80.0	78.8	Connecticut, Kansas, Minnesota, Nebraska, New York,[1] Ohio, Pennsylvania, Virginia, Wisconsin.	40,873,000
57	Diabetes	14.9	15.0	14.1	13.7	14.5	Nebraska, New York,[1] Pennsylvania, Virginia.	25,095,000
87–90	Heart disease	176.6	177.7	162.5	153.0	151.3	Nebraska, New York,[1] Ohio, Pennsylvania, Virginia.	31,805,000
100, 101	Pneumonia, all forms.	68.7	88.6	82.9	85.6	101.9	Connecticut, Kansas, Minnesota, Nebraska, New York,[1] Ohio, Pennsylvania, Virginia, Wisconsin.	40,873,000
113	Diarrhea and enteritis (under 2 years).	14.9	20.8	26.1	21.0	28.2	Connecticut, New York,[1] Ohio, Pennsylvania, Virginia, Wisconsin.	34,963,000
128, 129	Nephritis, all forms	79.7	83.1	78.4	75.4	76.6	Nebraska, New York,[1] Ohio, Pennsylvania, Virginia.	31,805,000

[1] Excluding New York City.

The gross mortality rate for 1927 was extremely favorable. This was true not only of the entire population group of 44,000,000 persons as a whole but also for each of the several States included, as well as for each of several large cities in the United States, and for a large group of industrial policy holders in the Metropolitan Life Insurance Company. For such comparison as may be worth while, Montreal has been included in the detailed table given below (Table 2). It will be recalled that this city suffered an unusual epidemic of typhoid fever in 1927.

TABLE 2.—*Mortality in 1923–1927 from all causes in certain States and cities and in a group of insured wage earners*

State, city, or population group	Rate per 1,000 population				
	1927	1926	1925	1924	1923
Connecticut	10.6	11.8	11.6	11.3	12.0
Michigan	11.5	12.7	11.8	12.2	12.8
Minnesota	9.2	9.7	9.7	9.5	10.0
Montana	9.4	9.8	9.3	9.1	9.0
Nebraska	8.9	9.1	9.2	9.2	9.5
New York (excluding New York City)	12.8	14.0	13.3	13.3	14.8
Ohio	11.2	12.2	11.6	11.2	12.3
Pennsylvania	11.4	12.5	12.2	12.3	13.3
Virginia:					
White	9.5	10.7	9.9	10.3	11.0
Colored	15.9	15.8	16.6	16.4	17.2
Wisconsin	10.3	10.6	10.5	10.2	10.7
Boston	14.0	14.9	14.8	14.1	14.9
Buffalo	12.7	14.3	13.8	12.2	13.0
Chicago	11.5	11.7	11.5	11.2	11.7
Detroit	10.8	12.6	11.0	11.4	12.4
New York City	11.8	12.8	12.2	12.2	11.7
Philadelphia	12.2	13.8	13.2	13.0	13.8
Providence	11.6	13.1	12.3	13.1	13.5
Montreal	14.3	14.1	14.3	14.9	15.7
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	8.4	8.9	8.5	8.5	9.0

It will be observed from the general table (Table 1) that the death rate for acute communicable diseases was also extremely favorable. This was true of typhoid, measles, scarlet fever, whooping cough, and diphtheria. Influenza also exhibited a lower rate in 1927 than that for any year since 1924 in the preceding 4-year period. On the other hand, the death rates for poliomyelitis and for meningococcus meningitis showed slight increases.

With respect to certain other important causes of death it may be of interest to present the rates for each of the States for which the records are available and for certain large cities, as well as the rates of the industrial policyholders of the Metropolitan Life Insurance Co., in detail. This is done in Table 3. It will be noted that the experience of the several States is not always uniform, but that, in general, the following comments seem to be warranted:

The tuberculosis death rate for a population of over 41,000,000 was 57.9 per 100,000 in 1927, as compared with 63.7 in 1926, which was the lowest year of record.

The death rate from cancer for a population group almost as large showed only a slight increase over 1926. Although the rate for this population group exhibited a continuation of an apparent upward trend, the increase in 1927 over 1926 was smaller than that for any of the previous four years.

TABLE 3.—*Mortality from certain causes in several States and cities and in a group of insured wage earners* *

TUBERCULOSIS, ALL FORMS (31-37)

State, city, or population group	Rate per 1,000 population				
	1927	1926	1925	1924	1923
Connecticut	66.8	78.2	75.3	81.5	89.3
Kansas	35.3	41.0	43.0	41.7	41.9
Minnesota	58.3	63.6	61.0	66.4	73.5
Montana	65.2	67.6	68.5	79.4	73.4
Nebraska	32.3	34.8	35.1	35.8	34.1
New York (excluding New York City)	77.3	84.8	88.7	91.4	100.9
Ohio	70.8	79.1	74.2	81.3	85.8
Pennsylvania	69.9	77.0	76.9	81.9	85.1
Virginia:					
White	67.6	73.3	73.2	75.9	81.2
Colored	181.4	180.1	198.7	201.5	217.7
Wisconsin	59.3	64.8	61.0	62.9	65.8
Boston	86.1	100.9	100.9	100.9	102.7
Buffalo	81.3	94.7	87.5	96.8	99.3
Chicago	82.8	83.2	83.2	82.7	80.9
Detroit	91.4	93.5	90.4	100.4	95.5
New York City	86.1	93.0	93.2	95.8	95.7
Philadelphia	85.5	96.0	101.2	103.8	110.9
Providence	57.3	53.6	61.5	75.6	86.6
Montreal	126.7	139.4	(1)	(1)	(1)
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	93.5	99.5	98.2	104.4	110.5

CANCER (43-49)

Connecticut	106.8	106.7	107.6	104.1	98.2
Kansas	100.6	91.9	84.3	75.8	80.1
Minnesota	101.9	99.7	104.3	99.5	98.8
Nebraska	101.6	94.7	95.8	86.8	82.8
New York (excluding New York City)	123.8	122.0	121.2	119.9	123.6
Ohio	98.5	100.3	92.1	95.2	94.5
Pennsylvania	95.3	96.4	91.8	91.5	89.9
Virginia:					
White	64.9	66.7	64.3	64.2	63.5
Colored	52.8	49.2	55.9	53.4	52.0
Wisconsin	101.0	106.4	103.4	98.9	91.6
Boston	154.8	149.8	148.7	153.1	148.2
Buffalo	126.0	121.3	121.7	113.3	109.7
Chicago	109.6	106.4	107.5	108.1	102.2
Detroit	77.9	78.1	72.5	89.4	79.9
New York City	124.7	118.7	115.4	112.5	106.1
Philadelphia	113.4	116.9	111.2	114.1	117.0
Providence	119.3	136.1	123.0	119.0	123.3
Montreal	85.9	88.8	(1)	(1)	(1)
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	75.3	75.1	71.8	71.5	72.7

DIABETES MELLITUS (57)

Nebraska	22.0	17.7	20.2	18.5	22.5
New York (excluding New York City)	24.4	23.8	22.6	21.4	24.5
Pennsylvania	19.0	19.6	18.2	18.6	18.8
Virginia:					
White	10.0	12.7	11.2	11.0	12.1
Colored	12.5	13.3	9.8	8.6	11.2
Boston	23.6	26.2	21.3	23.7	24.3
Buffalo	17.3	30.6	24.3	19.3	20.9
Chicago	22.7	25.6	21.5	18.9	21.7
New York City	24.4	25.1	22.3	20.2	22.9
Providence	18.7	22.9	23.5	18.0	26.9
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	17.0	17.0	15.5	15.1	16.2

* Rates for all years are based on tabulations made by the separate States and cities. Final figures of the United States Bureau of the Census may therefore differ slightly from the rates given in these tables.
[1] Not available.

TABLE 3.—*Mortality from certain causes in several States and cities and in a group of insured wage earners*—Continued

HEART DISEASE (87-90)

State, city, or population group	Rate per 1,000 population				
	1927	1926	1925	1924	1923
Nebraska	171.8	114.6	131.2	126.8	101.1
New York (excluding New York City)	286.8	302.8	273.4	261.3	266.7
Ohio	203.6	201.5	181.1	169.6	172.4
Pennsylvania	214.0	216.0	198.0	186.0	186.3
Virginia:					
White	144.2	154.9	140.1	142.0	134.2
Colored	222.8	209.6	211.5	202.3	190.6
Boston	269.1	289.6	257.6	224.3	244.0
Buffalo	192.9	267.0	253.9	134.1	134.7
Chicago	206.3	208.1	210.6	191.1	192.1
Detroit	136.1	143.6	126.6	137.6	136.7
New York City	267.8	277.9	266.3	271.4	245.5
Philadelphia	233.9	295.7	257.5	222.9	245.8
Providence	186.1	199.3	192.6	185.8	177.0
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	134.3	136.4	128.7	125.2	128.7

PNEUMONIA (ALL FORMS) (100, 101)

Connecticut	84.8	108.6	109.3	101.8	127.2
Kansas	50.9	59.1	66.0	67.3	89.6
Minnesota	63.1	70.2	70.7	69.4	76.1
Nebraska	62.1	85.7	83.5	87.0	92.0
New York (excluding New York City)	86.6	113.9	97.7	91.9	121.3
Ohio	78.4	97.3	87.6	91.7	128.7
Pennsylvania	98.1	133.0	126.0	137.0	155.4
Virginia:					
White	55.5	75.1	63.9	76.9	80.7
Colored	122.0	132.3	132.1	149.2	143.5
Wisconsin	64.8	82.5	88.7	89.4	106.3
Boston	140.3	162.9	151.5	131.8	170.4
Buffalo	112.4	129.0	128.2	93.3	114.2
Chicago	92.5	105.9	102.7	98.3	129.7
Detroit	98.8	153.6	126.0	134.6	185.6
New York City	126.2	177.6	142.9	157.0	138.9
Philadelphia	133.9	171.4	116.0	146.8	157.5
Providence	82.2	124.3	120.7	123.9	142.6
Montreal	111.8	155.0	(1)	(1)	(1)
Industrial policyholders, Metropolitan Life Insurance Co., ... and over	62.9	78.2	69.0	70.2	77.6

DIARRHEA AND ENTERITIS (UNDER 2 YEARS) (113)

Connecticut	11.2	16.0	18.6	19.8	21.8
Minnesota [2]	7.2	9.3	12.8	11.6	15.6
New York (excluding New York City)	13.9	18.5	24.7	21.0	29.1
Ohio	13.4	22.9	26.5	17.4	27.5
Pennsylvania	22.7	31.5	42.0	36.1	47.6
Virginia:					
White	23.3	33.9	35.2	27.9	36.5
Colored	50.6	51.2	62.5	49.5	61.9
Wisconsin	13.8	15.1	20.1	14.6	18.6
Boston	29.0	29.4	20.1	20.9	19.2
Buffalo	27.4	39.3	53.0	42.4	49.0
Chicago	17.3	19.4	29.6	29.6	37.9
New York City	12.3	16.2	19.7	18.7	24.6
Philadelphia	14.2	20.2	28.8	26.5	33.0
Providence	11.4	12.6	14.2	21.4	33.7
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	9.1	10.5	12.3	11.3	11.1

[1] Not available. [2] Diarrheal diseases of children.

TABLE 3.—*Mortality from certain causes in several States and cities and in a group of insured wage earners*—Continued

NEPHRITIS (ALL FORMS) (128, 129)

State, city, or population group	Rate per 1,000 population				
	1927	1926	1925	1924	1923
Nebraska	52.3	52.6	60.2	57.9	60.1
New York (excluding New York City)	124.4	123.8	118.2	111.8	117.3
Ohio	88.0	87.7	73.7	79.4	80.0
Pennsylvania	102.0	107.0	104.0	99.0	103.5
Virginia:					
White	92.6	99.9	94.8	87.0	82.1
Colored	143.8	140.6	146.1	135.1	123.3
Boston	83.6	83.9	75.8	74.3	84.2
Buffalo	51.3	52.3	65.2	66.0	79.7
Chicago	125.7	118.0	103.2	109.9	94.8
New York City	53.6	73.6	66.6	63.5	73.7
Philadelphia	105.0	98.4	109.9	114.8	148.6
Providence	112.3	128.8	117.7	110.7	95.7
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	70.5	74.9	71.2	66.5	69.6

The death rate for diabetes was slightly less than 1926 in a group of States with a population of slightly more than 25,000,000. It is interesting to note that in each of five large cities for which the diabetes rate is available, the death rate in 1927 exhibited a decrease as compared with 1926 in each instance. The diabetes death rate among the industrial policyholders of the Metropolitan Life Insurance Company exhibited no increase in 1927 as compared with 1926.

The death rate for heart disease in a group of States with a total population of nearly 32,000,000 also showed a slight decrease as compared with 1926, but otherwise the 1927 rate was considerably higher than the other three years of the five-year period considered. In some of the large cities the 1927 death rate from heart disease was even more favorable as compared with earlier years in the five-year period.

The 1927 death rate from pneumonia (all forms) was considerably below that for any of the other years in the five-year period, an indication which appeared not only for the population group as a whole but in each of the States and cities, as well as for the industrial policyholders.

The 1927 death rate for nephritis was also below that of 1926, but otherwise it was a continuation of the upward trend in a population group of about 32,000,000 persons. This indication is not so favorable as that furnished by the industrial experience of the Metropolitan Life Insurance Co., which showed that the 1927 death rate was not only lower than that of 1926 but was also lower than that of 1925.

The 1927 death rate for diarrhea and enteritis among persons under two years of age was extremely favorable, being well below that of any preceding year in a population group of approximately 35,000,000

persons. This was also borne out by the experience of the Metropolitan Life Insurance Co. for children between one and two years of age, and for each of the States and cities considered.

The infant mortality rate is given for two population groups in the general summary table (Table 1); one group includes a population of nearly 34,000,000, whereas the other group includes a population of nearly 24,000,000, but covers a longer period. For both the smaller and the larger population groups the infant mortality rate showed a marked decline in 1927 from the preceding year. The same indication is given by the more detailed series of rates in Table 4. It will be noted that for each of the nine States for which data are available for five years the 1927 infant mortality rate was definitely, and in some instances very markedly, below that of 1926 or of any of the four preceding years. The same was generally true of each of the seven large cities, although in one or two instances the 1927 rate was not lower than that of some previous year in the period considered.

TABLE 4.—*Infant mortality in 1923–1927 in certain States and cities*

State, city, or population group	Rate per 1,000 live births				
	1927	1926	1925	1924	1923
Connecticut	59	72	73	69	76
Michigan	68	78	76	72	80
Minnesota	52	57	60	56	61
Montana	66	74	69	66	72
Nebraska	51	59	58	55	57
New Jersey	61	70	69	70	72
New York (excluding New York City)	64	74	71	71	79
Pennsylvania	70	82	82	78	88
Virginia:					
White	62	72	67	65	70
Colored	107	110	111	104	114
Boston	77	85	85	74	83
Buffalo	71	84	86	84	90
Chicago	63	65	75	77	87
Detroit	70	85	80	78	88
New York City	56	68	65	68	66
Philadelphia	64	77	77	75	80
Providence	63	68	63	78	84

NO DIPHTHERIA IN WISCONSIN FOR A WEEK

Dr. C. A. Harper, State health officer of Wisconsin, reports that during the week ended September 1, 1928, not a single case of diphtheria was reported in the State of Wisconsin.

Doctor Harper says:

This is of special interest from the fact that in 1881, five years after the State Board of Health was organized, with the population of the State only half of the present population, there were 2,202 deaths from diphtheria. The records of that time are indefinite and incomplete; but if the real facts were known, at least another thousand deaths could be added to this number.

COURT DECISIONS RELATING TO PUBLIC HEALTH

City held liable for sewage pollution of stream.—(Oklahoma Supreme Court; City of Enid *v.* Brooks, 269 P. 241; decided July 24, 1928.) An action was brought against the city of Enid to recover damages for the pollution of a stream which extended into plaintiff's premises. The plaintiff alleged that the city had negligently operated and maintained its septic tanks and sewer system, and that the sewage, emptied from the septic tanks into the stream about a mile above plaintiff's premises, had polluted the stream to the injury of the plaintiff. It was further alleged that the plaintiff had been forced to abandon the dairy business because of the pollution of the stream, although her farm was specially suited for dairying purposes. A jury returned a verdict in favor of plaintiff and judgment was rendered thereon. On appeal, the city objected principally on the grounds that the evidence was insufficient to support the verdict and that the verdict was contrary to the evidence and the court's instructions. Regarding these objections the supreme court said:

* * * We think there was ample evidence of failure to use ordinary care in the maintaining and operating of the sewer system during at least the greater part of the two years covered by this suit.

* * * We think there can be no doubt but that the evidence is sufficient to raise the issue of failure to use ordinary care, on the part of the city, to show a causal relation between the negligence and the injury complained of, and to also show a substantial injury to the usable value of plaintiff's home and farm, and also a damage by reason of the discomfort, annoyances, and personal inconveniences caused plaintiff by the defendant. * * *

The city further contended that the negligence of the city's officers in the disposition of the sewage of the city was not a negligence of the city in its corporate capacity, for the reason that the operation of the sewer system was a governmental act which did not render the city liable for such negligent acts. The court's conclusion on this point was "that the city is liable to a riparian owner for damages sustained by reason of the negligent operation of a municipal sewer system by its officers and agents."

Still another contention of the city was that, since the evidence disclosed that the stream was polluted by storm sewers which drained areas about various industrial plants, etc., the plaintiff was not entitled to recover. But the court stated that "The fact that the stream may have been polluted from other sources would be no defense or excuse for the defendant to add thereto, and would be no defense to a recovery for any damages caused by its act."

City held liable for sewage pollution of spring and lake.—(Missouri Supreme Court, Division No. 2; Windle et ux. *v.* City of Springfield, 8 S. W. (2d) 61; decided June 21, 1928.) An action was brought against the city of Springfield to recover damages for the pollution of

a spring and lake on plaintiffs' land. A jury found that the pollution was due to percolations from a sewer connection installed by contractors employed by the city. A judgment in favor of the plaintiffs was rendered by the trial court, and this judgment was affirmed by the supreme court on appeal. The reasoning of the latter court is shown by the following excerpts from its opinion:

The question of the defendant's liability under the facts in this case does not depend upon the character of its act in ordering the installation of this sewer. That it was constructed under its authority it concedes, and defendant contends that its act in so doing was not ultra vires. We are therefore confronted with this state of facts in determining the defendant's liability: Was the control and use of the sewer after its installation and during its operation such as to cause the damages complained of by the plaintiffs?

However uniform the rule may be as to the nonliability of a municipality for acts in the exercise of its governmental or legislative capacity, it does not apply when the municipality makes such a use of its own land after the construction of a sewer as to constitute, as at bar, a private nuisance. Here the sewer was constructed upon the land of the city. In its use sewage flowing through the sewer percolated the adjacent soil and contaminated the plaintiffs' spring and lake, rendering the water of same unfit for domestic or other use and ladening the air with foul odors.

This general rule, sanctioned by many courts of last resort, may, under the facts at issue, be held applicable in the determination of the instant case; if a sewer, whatever its plan or the conditions under which it was installed, is so constructed as to cause a positive and direct invasion of the plaintiffs' property by percolating the soil in such a manner as to contaminate the owner's water to such an extent as to render it unfit for use, then the city may be held liable in an action for damages arising from such injury. * * *

PUBLIC HEALTH ENGINEERING ABSTRACTS

Refuse Disposal Plants at Baltimore. Frank K. Duncan. *Engineering News-Record*, vol. 100, No. 4, January 16, 1928, pp. 152–154. (Abstract by C. C. Ruchhoft.)

Baltimore's first refuse incinerator, which was of the Davis type, with a rated capacity of 40 tons of mixed refuse per day, was completed in 1924 at a cost of $105,000. At that time the rubbish was collected by the city and, after delivery at the plant, was carried on a conveyor belt from which paper, rags, bottles, and iron were picked off by colored labor. The tailings were pushed by laborers into the charging holes of the flat stationary grate furnaces. There was no space for storage of the wet refuse in this plant and it could not be successfully operated. The plant was remodeled by building a storage space for 175 tons of refuse, and installing one Moore chain grate furnace after the removal of two flat grate furnaces. Its capacity was thereby increased to 200 tons of refuse for a 24-hour day. The city refuse later was collected and hauled by contract at $5.75 per ton. The remodeled incinerator has been in operation since October 1, 1926. During the first year the plant disposed of 38,257 tons of refuse, with a total operating cost of $71,105. The total receipts from the sale of salvaged material were $46,517. The net operating cost was $24,588, or $0.643 per ton. A second incinerator, with a capacity of 250 tons per 24 hours, was completed in December, 1927, and is briefly described.

The Utilization of Towns' Refuse and Refuse Fuels. Arthur B. Scorer. *The Surveyor*, vol. 73, No. 1878, January 20, 1928, pp. 65–67. (Abstract by C. C. Ruchhoft.)

The salvage system of refuse disposal is compared with the disposal of unscreened refuse in a destructor, with the production of steam and electric power. The author concludes that the latter method is the most economical and the most sanitary. The calorific value of the refuse is estimated at from 2,500 to 3,000 B. t. u. per pound. Such refuse utilized in a large steam turbine generating set should produce 224 kw. h. per ton. Examples of several steam-raising plants burning up to 240 tons of refuse per day are given. Part of the revenue of these plants is obtained from the sale of the clinker produced.

The Present Position of the Milk Supply. F. E. Wynne. *Journal of the Royal Sanitary Institute*, vol. 49, No. 1, July, 1928, pp. 3-9. (Abstract by O. C. Hopkins.)

This paper discusses generally the position of the milk supply of England and some of the problems. One of their big problems is "an old, and I fear, unteachable generation to eliminate, and a rising generation to educate."

"If a perfect method of reconstitution of milk could be discovered, then I think the bulk of the milk of this country could be dried, and practically all of our milk problems would be solved. The ease with which milk lends itself to adulteration or sophistication is another serious drawback to its value as a food."

The local authorities have the power to refuse registration to retailers who fail to comply with reasonable regulations, but they do not have the same power over the wholesaler and producer and are compelled to take refuge in pasteurization and graded milk. "The principle of grading milk does not appeal to me. It savors too much of condoning the sale of foul milk to the poor man, and the bacterial count as a test is impractical and absurd. The man who can pay an extra penny a pint is deprived of some 70,000 organisms per c. c."

The present act has repealed the old Dairies, Cowsheds, and Milkshops Orders, and with them have gone provisions as to the cubic air space in the cowsheds. This is a most unfortunate and retrograde step. The prevalence of tuberculosis among cattle is largely due to the conditions under which we still permit them to be kept.

"The plea that healthy conditions and cleanliness are prohibitive in cost is one in which I do not believe. It is not a matter of premises or material; it is a matter of personality."

Tin Cans and Glass Jars as Bacterial Contaminants in Canned Foods. Carl J. Fellers. *American Journal of Public Health and Nation's Health*, vol. 18, No. 6, June, 1928, pp. 763-770. (Abstract by C. T. Butterfield.)

The literature is reviewed, the methods are described, and the results obtained from the examination of 387 unused cans are given. The bacterial content of cans varied from 1,400 to 162,000 per can. The distribution of organisms by groups was, cocci, 28.1%; aerobic spore bearers, 14.8%; asporogenous bacilli, 10.4%; actinomyces, 6.7%; anaerobes, 2.1%; molds, 24.0%; yeasts, 5.6%; and the remainder undetermined.

Large cans contained more bacteria in proportion to size than small cans. No differences were observed in the amounts of contamination found in different locations. (Investigations were made in six canneries in the Northwest, in New York, and in the New England States.)

The author thinks that there is grave danger of introducing undesirable organisms, such as *Cl. botulinum*, by this means.

Twenty Years of Experience of Sanitary Progress in India. F. C. Temple. *Journal of the Royal Sanitary Institute*, vol. 49, No. 1, July, 1928, pp. 13–24. (Abstract by O. C. Hopkins.)

Sanitation such as was coming into being in England a hundred years ago was almost unknown in India 20 years ago. Comparatively few towns had a piped water supply, and a very few indeed an underground sewerage system; still fewer had any form of sewage disposal works.

The increase in the number of public water supplies from 35 in 1905 to 92 in 1927, in five provinces, is an indication of the progress made in the twenty-two years in those areas, and is a fair measure of the progress throughout India.

In 1905, rapid filters were just being introduced. Great efficiency was claimed for them, but they were promoted a little too energetically at first. Like almost every other appliance introduced from the West, they needed modification in detail to suit Indian conditions.

The raw river water in riverside waterworks was found often to contain fine silt which settled very slowly, or even failed to settle at all without the liberal use of alum or aluminum ferric, and that frequently caused the water to be acid. During the monsoon and rains the water gave an acid reaction before the coagulants were added. This was caused by the carbonic acid gas liberated by nitric acid precipitated with the rain.

Experiments were made with sulphuric acid and aluminum ferric as coagulants, which were very satisfactory. Now, by judicial use of sulphuric acid and soda ash, all but one ton of silt per million gallons is brought down in the settling basins, and the saving in the cost of the coagulants will pay the cost of the plant in three years.

During the 20 years under review, the purification of water in India has changed from a somewhat haphazard rule of thumb to a scientific technical process.

In drainage, the progress has been even greater. In 1905 few towns outside of Calcutta and Bombay were sewered at all. Very many had no proper drainage system for sullage and rainwater. The latter ran off by the roads and the sullage putrified in ill-shaped earth ditches. The night soil was collected by hand, carted, and trenched. A strong belief existed that the hand removal conservancy system was more satisfactory for dwellings than any water flushed house connection could be. This belief was fostered by the long delay in finding a design of a water-flushed toilet suited to Indian needs, the cost of which was not utterly out of proportion to the cost of the house which it served.

Experiments have shown that for Indian conditions two cubic feet per user, and 5 and 40 gallons limits of dilutions are approximately the correct septic tank capacity and sewage dilutions.

Coagulation Processes in the Purification of River Water. C. P. Mom. Mededeel. Dienst Volksgezondheid Nederland. Indie, 17, 1–12, 13–9 (1928). Abstract by J. A. Kennedy in *Chemical Abstracts*, vol. 22, No. 12, June 20, 1928, p. 2223.

"Coagulation of the colloidal clay in the water of the Tjiliwong by means of lime was investigated. Removal of the excess lime still present after coagulation and filtration by means of lime-absorbing materials gave unsatisfactory results. Different methods of removing excess lime are discussed; the difficulties experienced in this portion of the purification process are not sufficiently compensated for by the advantage of the sterilizing effect of the lime as a coagulating agent. Coagulation of the colloidal clay by means of $Fe_2(SO_4)_3$ and lime also was investigated. $Fe(OH)_3$, together with the $Ca(OH)_2$, constitutes the actual coagulating agent in this process. The practical value of $Fe_2(SO_4)_3$ lime coagulation is discussed. Its sterilizing influence when treating water rich in alkali is a great advantage. Its disadvantages are (1) difficulty of neutralizing the alkalinity reaction after coagulation, and (2) the reductive character of the $Fe_2(SO_4)_3$ which requires extra O_2 in oxidizing the water."

Oxidation Processes in the Purification of River Water. C. P. Mom. Mededeel. Dienst Volksgezondheid Nederland. Indie, 17, 21–32 (1928). Abstract by J. A. Kennedy in *Chemical Abstracts*, vol. 22, No. 12, June 20, 1928, p. 2223.

"Different methods of oxidizing organic matter which occurs in river water and hinders coagulation were examined. The catalytic influence was shown of sunlight and colloidal clay on the decomposition of $KMnO_4$, Cl_2, and Caporite. This is a Griesheim Electron preparation of Ca hypochlorite with a content of so-called active Cl_2 of about 70 per cent. It is fairly stable and can be kept for a long time. Chemically and physiologically it is practically as active as liquid Cl_2, and in many cases can replace the latter. *Cf.* Geneeskundig Tijdschrift voor Nederland. Indie, 63, No. 6 (1923). Sunlight brings about decomposition more quickly and affects these oxidizing agents favorably. It is strongest in the case of $KMnO_4$. Filtered river water decomposes less of the oxidizing agent than raw water. Colloidal clay advances the decomposition both of $KMnO_4$ and of Caporite. In the flocculated form, clay does not act as strongly. Cl_2 gas acted practically the same as Caporite. Colloidal kaolin has no influence upon the decomposition of $KMnO_4$, but it does influence that of Caporite. In practice, the pH generally proves to be of little importance. Glazed earthenware jars and glass cylinders were used in the work. Considerable discussion of the above is given by the author."

Activities of Plankton in the Natural Purification of Polluted Water. W. C. Purdy. *American Journal of Public Health and The Nation's Health*, vol. 18, No. 4, April, 1928, pp. 468–475. (Abstract by W. C. Purdy.)

The natural purification of polluted water includes, as an important part of its program, the varied activities of plankton and related organisms. The more important of these activities are: (1) Food habits, whereby the plankton organisms utilize a portion of the dissolved organic matter; (2) photosynthesis, by means of which the chlorophyll-bearing organisms yield oxygen to the water, supplementing that obtained from the air; (3) the potential energy of harmful organic matter is released to the water in harmless kinetic form in terms of motion by the actively-swimming plankton, and this operates to produce an intimate mixing and microscopic circulation of the polluted water which are undoubtedly beneficial in the scheme of purification.

DEATHS DURING WEEK ENDED SEPTEMBER 8, 1928

Summary of information received by telegraph from industrial insurance companies for the week ended September 8, 1928, and corresponding week of 1927. (From the Weekly Health Index September 13, 1928, issued by the Bureau of the Census, Department of Commerce)

	Week ended Sept. 8, 1928	Corresponding week, 1927
Policies in force	71, 654, 862	68, 672, 749
Number of death claims	10, 127	9, 642
Death claims per 1,000 policies in force, annual rate	7. 4	7. 3

Deaths from all causes in certain large cities of the United States during the week ended September 8, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, September 13, 1928, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Sept. 8, 1928		Annual death rate per 1,000 corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended Sept. 8, 1928 [2]
	Total deaths	Death rate [1]		Week ended Sept. 8, 1928	Corresponding week, 1927	
Total (68 cities)	5,961	10.3	11.3	703	726	[3] 57
Akron	32			7	1	76
Albany [4]	25	10.9	17.9	2	4	41
Atlanta	70	14.3	14.0	11	8	
White	35		9.8	4	5	
Colored	35	(5)	24.0	7	3	
Baltimore [4]	186	13.0	12.0	24	16	76
White	142		10.6	16	12	64
Colored	44	(5)	19.9	8	4	125
Birmingham	71	16.7	17.0	14	6	120
White	34		11.8	8	2	110
Colored	37	(5)	25.2	6	4	135
Boston	173	11.3	13.7	25	31	69
Buffalo	115	10.8	12.4	13	15	56
Cambridge	20	8.3	9.3	0	6	0
Camden	22	8.5	9.8	5	3	80
Canton	19	8.5	9.2	2	1	48
Chicago [4]	562	9.3	11.8	78	79	67
Cincinnati	108	13.6	19.5	15	26	91
Cleveland	143	7.4	9.3	13	19	35
Columbus	77	13.5	10.6	7	4	65
Dallas	37	8.9	11.8	8	8	
White	30		9.6	6	7	
Colored	7	(5)	26.6	2	1	
Denver	84	14.9	16.4	7	13	
Des Moines	28	9.6	9.5	1	1	17
Detroit	244	9.3	10.2	41	46	63
Duluth	26	11.6	7.7	0	1	0
El Paso	31	13.8	13.8	5	12	
Erie	21			3	2	62
Fall River [4]	30	11.7	9.4	1	3	17
Flint	39	13.7	9.1	11	4	140
Fort Worth	34	10.6	9.9	2	6	
White	23		7.6	1	3	
Colored	11	(5)	26.6	1	3	
Grand Rapids	25	8.0	10.3	2	5	30
Houston	46			5	7	
Indianapolis	82	11.2	12.0	10	7	76
White	69		11.6	7	5	61
Colored	13	(5)	15.1	3	2	182
Jersey City	65	10.5	8.1	14	6	105
Kansas City, Kans	18	8.0	11.5	4	2	84
White	13		10.8	3	0	74
Colored	5	(5)	14.8	1	2	145
Kansas City, Mo	103	13.8	10.5	13	6	92
Knoxville	26	12.9	14.8	5	3	109
White	22		11.6	5	2	121
Colored	4	(5)	38.5	0	1	0
Los Angeles	205			10	9	29
Louisville	68	10.8	13.5	9	6	75
White	49		12.3	8	5	76
Colored	19	(5)	20.3	1	1	69
Lowell	22	10.4	12.3	5	3	105
Lynn	9	4.5	9.0	0	1	0
Memphis	59	16.2	17.5	11	3	129
White	38		13.5	11	2	206
Colored	21	(5)	24.7	0	1	0
Milwaukee	93	8.9	13.1	9	13	40
Minneapolis	70	8.0	8.7	4	9	24
Nashville	31	11.7	20.1	3	7	47
White	19		17.4	2	6	43
Colored	12	(5)	26.8	1	1	60

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births. Cities left blank are not in the registration area for births.
[3] Data for 67 cities.
[4] Deaths for week ended Friday, Sept. 7, 1928.
[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

Deaths from all causes in certain large cities of the United States during the week ended September 8, 1928, infant mortality, annual death rate, and comparison with corresponding week of 1927. (From the Weekly Health Index, September 13, 1928, issued by the Bureau of the Census, Department of Commerce)—Continued

City	Week ended Sept. 8, 1928		Annual death rate per 1,000 corresponding week, 1927	Deaths under 1 year		Infant mortality rate, week ended Sept. 8, 1928
	Total deaths	Death rate		Week ended Sept. 8, 1928	Corresponding week, 1927	
New Bedford	18	7.9	10.0	4	3	87
New Haven	21	5.8	6.5	4	2	56
New Orleans	136	16.6	17.1	15	15	73
White	77		13.3	8	7	58
Colored	59	(5)	27.9	7	8	102
New York	1,122	9.7	10.3	134	129	54
Bronx Borough	148	8.1	8.1	14	15	42
Brooklyn Borough	383	8.7	9.7	47	45	47
Manhattan Borough	439	13.1	13.4	62	60	73
Queens Borough	112	6.9	6.9	9	7	36
Richmond Borough	40	13.9	13.2	2	2	36
Newark, N. J	117	12.9	11.4	16	10	82
Oklahoma City	28			4	3	
Omaha	34	8.0	13.3	3	6	35
Paterson	17	6.1	10.9	0	3	0
Philadelphia	406	10.3	10.0	54	43	73
Pittsburgh	126	9.8	9.8	15	22	49
Portland, Oreg	52			3	3	32
Providence	44	8.0	8.0	6	3	52
Richmond	39	10.5	14.7	6	9	78
White	24		10.0	2	2	41
Colored	15	(5)	26.3	4	7	147
Rochester	56	8.9	10.4	1	8	8
St. Louis	186	11.5	11.1	12	15	40
St. Paul	47	9.7	9.8	3	4	29
Salt Lake City [4]	23	8.7	10.0	2	3	33
San Antonio	40	9.6	8.9	5	2	
San Diego	19	8.3	14.0	1	1	19
San Francisco	144	12.9	12.7	7	2	44
Schenectady	20	11.2	9.0	2	3	63
Seattle	66	9.0	8.9	2	2	21
Somerville	13	6.6	13.3	0	7	0
Spokane	33	15.8	20.1	1	1	26
Springfield, Mass	21	7.3	12.4	4	5	63
Syracuse	39	10.2	10.9	4	1	49
Tacoma	21	9.9	13.1	1	0	26
Toledo	56	9.3	12.3	3	9	29
Trenton	46	17.3	13.7	2	10	34
Utica	22	11.0	14.1	3	4	68
Washington, D. C	95	9.0	11.0	7	13	40
White	63		9.9	2	8	17
Colored	32	(5)	14.2	5	5	92
Waterbury	13			0	1	0
Wilmington, Del	22	9.0	10.7	3	0	79
Worcester	43	11.4	9.9	2	3	24
Yonkers	21	9.1	10.5	4	1	91
Youngstown	33	9.9	16.0	3	4	40

[4] Deaths for week ended Friday, Sept. 7, 1928.

[5] In the cities for which deaths are shown by color, the colored population in 1920 constituted the following percentages of the total population: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.

PREVALENCE OF DISEASE

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

UNITED STATES

CURRENT WEEKLY STATE REPORTS

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

EDITORIAL NOTE: The compilation of cases of communicable diseases reported by telegraph by the State health officers for the week ended September 15, 1928, will appear in the Public Health Reports for September 28, 1928, and in the future these reports will be published one week later than they have been heretofore. This change will make possible the inclusion of all delayed reports in this tabulation and will remove a factor of delay in the final issuance of the Public Health Reports. This current telegraphic information will continue to be mailed out in mimeographed form to State health officers, however, and will be forwarded, as usual, during the week immediately following that for which the reports are made.

Reports for Week Ended September 8, 1928

SOUTH DAKOTA

	Cases
Diphtheria	2
Measles	1
Poliomyelitis	2
Scarlet fever	2
Smallpox	1
Typhoid fever	1

NORTH CAROLINA

Diphtheria	72
Measles	16
Poliomyelitis	2
Scarlet fever	51
Smallpox	8
Typhoid fever	54

Report for Week Ended August 25, 1928

NEW YORK

	Cases
Diphtheria	109
Influenza	11
Measles	92
Meningococcus meningitis	36
Poliomyelitis	96
Scarlet fever	45
Typhoid fever	64

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
August, 1928										
Arizona	0	4	1	1	15	----	0	----	1	3
Connecticut	6	47	11	1	122	----	13	30	0	19
Nebraska	0	22	8	----	14	----	4	54	38	25
North Dakota	9	18	6	----	13	----	51	53	0	1

August, 1928

	Cases
Anthrax:	
Connecticut	1
Chicken pox:	
Connecticut	23
Nebraska	17
North Dakota	7
Dysentery:	
Connecticut (bacillary)	3
German measles:	
Connecticut	7
Lead poisoning:	
Connecticut	1
Leprosy:	
Arizona	1
Lethargic encephalitis:	
Connecticut	2
North Dakota	1
Mumps:	
Arizona	8
Connecticut	39
Nebraska	15
North Dakota	1

August, 1928—Continued

	Cases
Paratyphoid fever:	
Connecticut	1
Nebraska	3
Rabies in animals:	
Connecticut	1
Rabies in man:	
Nebraska	1
Septic sore throat:	
Connecticut	6
Nebraska	2
Trachoma:	
Arizona	7
Undulant (Malta) fever:	
Arizona	2
Connecticut	1
North Dakota	2
Vincent's angina:	
North Dakota	10
Whooping cough:	
Arizona	8
Connecticut	266
Nebraska	75
North Dakota	57

OUTBREAK OF PARATYPHOID FEVER IN ROCK COUNTY, WIS.

The Director of the Bureau of Communicable Diseases of the State Board of Health of Wisconsin states that the 126 cases reported in the Public Health Reports, August 3, 1928, page 2041, as typhoid fever were cases of paratyphoid B. The outbreak occurred in Rock County, Wis., and was due largely to a carrier who worked in the preparation of ice cream.

PLAGUE-INFECTED GROUND SQUIRRELS IN CALIFORNIA

The Director of the State Department of Public Health of California has reported that plague infection in ground squirrels has been proved by animal inoculation in a squirrel received August 27, 1928, which was found dead in Conejo, Fresno County, and in one lot of ground squirrels received August 27, 1928, from a ranch one-fourth mile southwest of Triunfo, Ventura County.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 97 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 31,310,000. The estimated population of the 91 cities reporting deaths is more than 30,615,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended September 1, 1928, and September 3, 1927

	1928	1927	Estimated expectancy
Cases reported			
Diphtheria:			
42 States	771	1,224	
97 cities	335	497	513
Measles:			
41 States	548	673	
97 cities	127	123	
Poliomyelitis:			
41 States	324	537	
Scarlet fever:			
42 States	673	1,046	
97 cities	195	336	285
Smallpox:			
42 States	147	127	
97 cities	3	23	16
Typhoid fever:			
42 States	1,060	1,234	
97 cities	174	190	204
Deaths reported			
Influenza and pneumonia:			
91 cities	341	351	
Smallpox:			
91 cities	0	1	
St. Joseph, Mo	0	1	

City reports for week ended September 1, 1928

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding weeks of the preceding years. When the reports include several epidemics or when for other reasons the median is unsatisfactory, the epidemic periods are excluded and the estimated expectancy is the mean number of cases reported for the week during non-epidemic years.

If the reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1919 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviation from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Population July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND									
Maine:									
Portland	76,400	0	0	0	0	0	0	0	1
New Hampshire:									
Concord	[1] 22,546	0	0	0	0	0	0	0	1
Vermont:									
Barre	[1] 10,008	0	0	0	0	0	0	0	0
Massachusetts:									
Boston	787,000	4	25	3	0	0	3	0	2
Fall River	131,000	0	1	0	0	0	4	0	1
Springfield	145,000	1	0	1	0	0	8	0	0
Worcester	193,000	0	3	4	0	0	2	2	0
Rhode Island:									
Pawtucket	71,000	0	0	0	0	0	0	0	1
Providence	275,000	0	4	2	0	0	20	0	3
Connecticut:									
Bridgeport	[2]	0	4	3	0	0	0	0	2
Hartford	164,000		3						
New Haven	182,000	0	2	0	0	0	1	0	1
MIDDLE ATLANTIC									
New York:									
Buffalo	544,000	2	11	7		0	0	2	6
New York	5,924,000	3	83	74	4	2	19	3	72
Rochester	321,000	0	5	2		1	2	0	4
Syracuse	185,000	2	2	2		0	1	2	0
New Jersey:									
Camden	131,000	2	2	0	0	0	0	0	1
Newark	459,000	3	6	7	2	0	2	3	1
Trenton	134,000	0	2	0	0	0	0	0	0
Pennsylvania:									
Philadelphia	2,008,000	9	33	22	0	2	3	0	32
Pittsburgh	637,000	1	13	5	0	1	3	3	8
Reading	114,000	0	2	1	0	0	3	0	0
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	411,000	5	4	5	0	2	1	0	6
Cleveland	960,000	2	25	9	5	0	10	4	6
Columbus	285,000	0	2	1	1	0	1	1	0
Toledo	295,000	4	6	0	1	1	1	0	6
Indiana:									
Fort Wayne	99,900	0	1	0	0	0	0	0	2
Indianapolis	367,000	0	3	0	0	0	0	0	2
South Bend	81,700		1						
Terre Haute	71,900	0	0	0	0	0	0	0	0
Illinois:									
Chicago	3,048,000	3	43	55	3	2	15	4	36
Springfield	64,700	0	1	0	0	0	0	0	2
Michigan:									
Detroit	[1] 1,242,044	8	31	21	0	0	4	3	15
Flint	136,000	2	4	0	0	0	0	0	0
Grand Rapids	156,000	0	2	0	0	1	1	2	0

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended September 1, 1928—Continued

Division, State, and city	Population July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST NORTH CENTRAL—continued									
Wisconsin:									
Kenosha	52,700		0						
Milwaukee	517,000	6	8	0	0	0	9	2	7
Racine	69,400	1	1	0	0	0	0	0	0
Superior	[1] 39,671	0	0	1	0	0	2	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	113,000	1	0	1	0	0	0	0	1
Minneapolis	434,000	4	13	3	0	0	1	0	2
St. Paul	248,000	1	11	1	0	0	0	0	3
Iowa:									
Davenport	[1] 52,469	0	0	0	0		0	0	
Sioux City	78,000	0	1	0	0		0	0	
Waterloo	36,900	0	0	0	0		0	1	
Missouri:									
Kansas City	375,000	0	3	0	0	0	0	1	5
St. Joseph	78,400	0	1	0	0	0	0	0	0
St. Louis	830,000	1	19	18	0	0	0	2	
North Dakota:									
Fargo	[1] 26,403	0	0	0	0	0	0	0	1
Grand Forks	[1] 14,811	0	0	0	0		0	0	
South Dakota:									
Aberdeen	[1] 15,036	3	0	0	0		1	0	
Sioux Falls	[1] 30,127	0	0	0	0		0	0	
Nebraska:									
Omaha	216,000	0	6	3	0	0	0	0	2
Kansas:									
Topeka	56,500	0	1	0	0	1	1	0	0
Wichita	92,500	0	1	0	0	0	0	0	1
SOUTH ATLANTIC									
Delaware:									
Wilmington	124,000	0	1	0	0	0	0	0	2
Maryland:									
Baltimore	808,000	2	15	8	3	0	0	2	14
Cumberland	[1] 33,741	0	0	0	0	0	0	0	0
Frederick	[1] 12,035	0	0	0	0	0	0	0	0
District of Columbia:									
Washington	528,000	0	7	12	0	0	0	0	8
Virginia:									
Lynchburg	[3] 38,493	0	1	1	0	0	0	0	0
Norfolk	174,000	0	1	0	0	0	0	0	2
Richmond	189,000	0	2	2	0	0	0	0	5
Roanoke	61,900	1	3	3	0	0	1	0	0
West Virginia:									
Charleston	50,700	0	1	0	0	0	0	0	2
Wheeling	[1] 56,208	0	1	0	0	0	0	1	0
North Carolina:									
Raleigh	[1] 30,371	0	1	1	0	0	0	0	0
Wilmington	37,700	0	0	0	0	0	0	0	1
Winston-Salem	71,800	0	2	0	0	0	0	0	1
South Carolina:									
Charleston	74,100	0	1	0	1	0	0	1	1
Columbia	41,800	0	1	0	0	0	0	1	1
Greenville	[1] 27,311		1						
Georgia:									
Atlanta	(2)	0	4	2	1	0	1	0	2
Brunswick	[1] 16,809	0	0	0	0	0	0	0	0
Savannah	94,900	0	1	0	5	0	0	0	1
Florida:									
Miami	[3] 131,286	0	2	1	1	0	1	0	1
St. Petersburg	[3] 47,629		0			0			0
Tampa	102,000	0	2	2	0	2	0	0	1

[1] Estimated, July 1, 1925. [2] No estimate made. [3] Special census.

City reports for week ended September 1, 1928—Continued

Division, State, and city	Population July 1, 1926, estimated	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
			Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
EAST SOUTH CENTRAL									
Kentucky:									
Covington	58,500	1	0	1	0	0	0	0	1
Louisville	311,000	0	3	3	0	0	0	0	7
Tennessee:									
Memphis	177,000	0	3	0	0	1	0	0	2
Nashville	137,000	0	2	2	0	0	0	0	3
Alabama:									
Birmingham	211,000	0	4	0	0	0	2	0	7
Mobile	66,800	0	0	2	3	0	0	0	0
Montgomery	47,000	0	1	0	0	----	0	0	----
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	[1] 31,643	0	0	1	0	----	0	1	----
Little Rock	75,900	0	0	0	0	0	0	0	1
Louisiana:									
New Orleans	419,000	0	6	5	5	1	0	0	3
Shreveport	59,500	0	1	0	0	0	0	0	2
Oklahoma:									
Oklahoma City	[2]	0	2	2	3	0	0	0	2
Tulsa	133,000	0	0	0	0	----	1	0	----
Texas:									
Dallas	203,000	0	4	8	0	0	0	1	1
Fort Worth	159,000	0	2	2	0	0	0	0	2
Galveston	49,100	0	0	0	0	0	0	0	0
Houston	[1] 164,954	0	2	7	0	0	0	0	4
San Antonio	205,000	0	1	4	0	0	0	0	5
MOUNTAIN									
Montana:									
Billings	[1] 17,971	0	0	0	0	0	0	0	0
Great Falls	[1] 29,883	1	0	0	0	0	0	0	0
Helena	[1] 12,037	0	0	0	0	0	0	0	0
Missoula	[1] 12,668	0	0	0	0	0	0	0	0
Idaho:									
Boise	[1] 23,042	0	0	1	0	0	0	0	0
Colorado:									
Denver	285,000	4	10	2	----	2	1	6	3
Pueblo	43,900	0	2	1	0	0	1	0	2
New Mexico:									
Albuquerque	[1] 21,000	2	1	3	0	0	0	2	0
Utah:									
Salt Lake City	133,000	1	2	1	0	0	0	3	1
Nevada:									
Reno	[1] 12,665	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	[2]	3	2	0	0	----	0	0	----
Spokane	109,000	7	1	1	0	----	2	0	----
Tacoma	106,000	0	2	0	0	0	0	3	1
Oregon:									
Portland	[1] 282,383	0	5	1	0	1	1	1	3
California:									
Los Angeles	[2]	0	23	6	4	1	2	3	8
Sacramento	73,400	2	2	0	0	0	0	1	0
San Francisco	567,000	5	11	1	2	0	1	0	3

[1] Estimated, July 1, 1925.

[2] No estimate made.

City reports for week ended September 1, 1928—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
NEW ENGLAND											
Maine:											
Portland	1	1	0	0	0	0	1	0	0	0	15
New Hampshire:											
Concord	0	0	0	0	0	0	0	0	0	0	7
Vermont:											
Barre	0	3	0	0	0	0	0	0	0	1	3
Massachusetts:											
Boston	14	15	0	0	0	11	4	3	0	27	182
Fall River	1	0	0	0	0	3	1	0	0	9	
Springfield	2	2	0	0	0	4	0	0	0	0	29
Worcester	2	0	0	0	0	2	0	0	0	2	34
Rhode Island:											
Pawtucket	0	0	0	0	0	0	0	0	0	1	10
Providence	2	3	0	0	0	1	1	4	0	0	45
Connecticut:											
Bridgeport	1	3	0	0	0	2	0	0	0	4	32
Hartford	2		0				1				
New Haven	2	1	0	0	0	0	2	3	0	7	31
MIDDLE ATLANTIC											
New York:											
Buffalo	5	4	0	0	0	5	3	0	0	52	110
New York	26	11	0	0	0	108	44	25	3	89	1,273
Rochester	2	0	0	0	0	1	2	1	0	2	55
Syracuse	3	0	0	0	0	1	1	0	0	17	44
New Jersey:											
Camden	1	1	0	0	0	0	1	3	0	2	31
Newark	4	1	0	0	0	9	2	0	1	29	91
Trenton	0	0	0	0	0	2	1	0	0	2	29
Pennsylvania:											
Philadelphia	20	10	0	0	0	33	12	5	0	47	440
Pittsburgh	9	2	0	0	0	13	3	2	1	24	159
Reading	0	0	0	0	0	0	0	1	0	16	26
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	4	2	1	0	0	11	2	3	0	6	146
Cleveland	11	8	0	0	0	16	5	3	0	47	175
Columbus	3	0	0	0	0	9	1	0	0	14	76
Toledo	4	2	0	0	0	5	2	2	0	17	65
Indiana:											
Fort Wayne	1	0	0	0	0	3	1	1	0	1	32
Indianapolis	2	4	0	0	0	3	1	2	2	4	101
South Bend	1		0				0				
Terre Haute	0	1	0	0	0	1	0	0	0	1	25
Illinois:											
Chicago	26	17	1	0	0	49	7	3	1	72	642
Springfield	1	0	0	0	0	0	0	0	0	1	14
Michigan:											
Detroit	25	9	1	0	0	33	5	6	0	175	276
Flint	4	0	0	1	0	2	2	2	0	11	40
Grand Rapids	3	2	1	0	0	0	1	0	0	6	32
Wisconsin:											
Kenosha	1		0				0				
Milwaukee	7	4	0	0	0	7	1	1	0	104	89
Racine	2	0	0	0	0	0	0	0	0	3	8
Superior	1	0	1	0	0	0	0	1	0	0	7
WEST NORTH CENTRAL											
Minnesota:											
Duluth	3	2	0	0	0	0	0	0	0	3	16
Minneapolis	13	6	1	0	0	3	1	1	1	1	73
St. Paul	5	8	1	0	0	5	1	0	0	18	43
Iowa:											
Davenport	1	1	0	0			0	0		0	
Sioux City	0	1	0	0			0	0		1	
Waterloo	0	0	0	0			0	0		0	
Missouri:											
Kansas City	2	1	1	0	0	1	2	7	0	2	68
St. Joseph	1	2	0	0	0	1	0	1	0	0	13
St. Louis	9	7	0	0	0	17	7	7	1	18	195

City reports for week ended September 1, 1928—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST NORTH CENTRAL—continued											
North Dakota:											
Fargo	0	1	0	0	0	0	0	0	0	0	8
Grand Forks	1	0	0	0	----	----	0	0	----	0	----
South Dakota:											
Aberdeen	0	1	0	0	----	----	0	0	----	9	----
Sioux Falls	0	1	0	0	----	----	0	0	----	0	3
Nebraska:											
Omaha	2	0	0	0	0	3	0	1	0	1	49
Kansas:											
Topeka	1	0	0	0	0	0	0	0	0	5	21
Wichita	1	0	0	0	0	2	2	3	1	3	25
SOUTH ATLANTIC											
Delaware:											
Wilmington	0	0	0	0	0	0	1	1	1	0	35
Maryland:											
Baltimore	6	4	0	0	0	12	10	4	0	83	195
Cumberland	0	0	0	0	0	0	1	1	1	0	9
Frederick	0	0	0	0	0	0	1	2	0	0	1
District of Col.:											
Washington	4	1	0	0	0	7	4	1	0	6	111
Virginia:											
Lynchburg	0	0	0	0	0	0	1	1	0	0	5
Norfolk	0	0	0	0	0	2	2	1	0	1	----
Richmond	3	0	0	0	0	7	2	4	0	0	43
Roanoke	1	3	0	0	0	1	0	0	0	0	18
West Virginia:											
Charleston	1	0	0	0	0	0	1	0	0	0	7
Wheeling	2	0	0	0	0	1	0	1	0	1	12
North Carolina:											
Raleigh	0	0	0	0	0	0	0	0	0	0	11
Wilmington	0	0	0	0	0	0	0	0	0	0	8
Winston-Salem	1	3	0	0	0	1	2	0	0	0	16
South Carolina:											
Charleston	0	0	0	0	0	2	2	6	0	0	23
Columbia	0	0	0	0	0	1	2	0	2	1	17
Greenville	0	----	1	----	----	----	0	----	----	----	----
Georgia:											
Atlanta	4	4	1	0	0	8	5	----	0	2	49
Brunswick	0	0	0	0	0	0	0	0	1	0	8
Savannah	0	1	0	0	0	3	1	2	0	0	41
Florida:											
Miami	0	0	0	0	0	1	0	0	0	7	28
St. Petersburg	0	----	0	----	0	2	0	----	0	----	8
Tampa	1	1	0	0	0	1	1	1	0	0	27
EAST SOUTH CENTRAL											
Kentucky:											
Covington	0	2	0	0	0	3	1	0	0	0	17
Louisville	2	6	0	0	0	4	5	2	1	0	89
Tennessee:											
Memphis	1	10	0	0	0	5	6	9	0	0	68
Nashville	2	1	0	0	0	1	7	8	1	2	46
Alabama:											
Birmingham	3	0	0	0	0	6	6	4	1	9	65
Mobile	0	0	1	0	0	0	1	2	0	0	24
Montgomery	0	0	0	0	----	----	1	2	----	0	----
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	0	0	0	----	----	0	0	----	1	----
Little Rock	0	0	0	0	0	1	2	1	0	0	----
Louisiana:											
New Orleans	1	2	0	0	0	11	4	4	0	1	118
Shreveport	1	0	0	0	0	3	1	1	0	0	34
Oklahoma:											
Oklahoma City	1	1	0	0	0	3	2	8	0	0	35
Tulsa	0	0	0	0	----	----	2	3	----	1	----

City reports for week ended September 1, 1928—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases reported	Cases, estimated expectancy	Cases reported	Deaths reported		Cases, estimated expectancy	Cases reported	Deaths reported		
WEST SOUTH CENTRAL—CON.											
Texas:											
Dallas	2	2	1	0	0	2	3	5	0	2	65
Fort Worth	1	2	0	0	0	2	1	1	0	0	34
Galveston	0	0	0	0	0	0	0	0	0	0	18
Houston	1	3	0	0	0	4	1	7	0	0	64
San Antonio	1	4	0	0	0	11	2	0	0	0	66
MOUNTAIN											
Montana:											
Billings	0	0	0	0	0	0	0	0	0	0	3
Great Falls	0	0	0	0	0	0	1	1	0	0	6
Helena	0	0	0	0	0	0	0	0	0	0	3
Missoula	0	0	0	0	0	0	0	0	0	0	-------
Idaho:											
Boise	0	0	0	0	0	0	0	0	0	1	6
Colorado:											
Denver	3	1	1	0	0	11	2	1	0	25	84
Pueblo	0	1	0	0	0	0	0	0	0	0	17
New Mexico:											
Albuquerque	0	1	0	0	0	5	0	0	0	0	16
Utah:											
Salt Lake City	1	1	0	0	0	0	1	3	0	5	25
Nevada:											
Reno	0	1	0	0	0	0	0	0	0	0	4
PACIFIC											
Washington:											
Seattle	4	2	0	0	-------	-------	2	3	-------	3	-------
Spokane	4	2	0	2	-------	-------	0	0	-------	3	-------
Tacoma	0	0	1	0	0	0	0	1	0	2	23
Oregon:											
Portland	2	1	5	8	0	3	1	0	0	0	55
California:											
Los Angeles	7	1	1	0	0	21	3	4	0	43	215
Sacramento	0	3	0	0	0	2	1	1	0	13	18
San Francisco	5	4	1	0	0	10	1	1	0	3	142

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston	0	0	0	0	2	0	2	14	0
Fall River	0	0	0	0	0	0	0	1	0
Worcester	0	0	0	0	0	0	0	2	0
Connecticut:									
Bridgeport	1	1	0	0	0	0	0	1	0
New Haven	0	0	0	1	0	0	0	1	1
MIDDLE ATLANTIC									
New York:									
Buffalo	0	0	0	0	0	0	0	4	2
New York	25	15	3	2	0	0	11	65	15
Syracuse	0	0	0	0	0	0	0	4	0
Pennsylvania:									
Philadelphia	5	1	2	2	0	0	1	1	0
Pittsburgh	1	0	0	0	0	0	0	0	0

City reports for week ended September 1, 1928—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	1	0	0	0	0	0	0	0	0
Cleveland	2	1	0	0	0	0	0	5	2
Toledo	0	0	0	0	0	0	0	1	0
Illinois:									
Chicago	4	6	0	0	2	2	5	3	2
Michigan:									
Detroit	0	0	1	0	0	0	1	3	0
Flint	0	0	0	0	0	0	0	1	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	0	0	0	0	0	0	0	1	0
St. Paul	0	0	0	0	0	0	1	0	1
Missouri:									
Kansas City	1	1	0	0	0	0	1	0	0
St. Louis	1	1	0	0	0	0	1	0	0
North Dakota:									
Fargo	0	0	1	0	0	0	0	0	0
Grand Forks	0	0	0	0	0	0	0	1	0
SOUTH ATLANTIC [2]									
Maryland:									
Baltimore	1	2	0	0	0	0	1	19	2
Cumberland	0	0	0	0	0	0	0	1	0
District of Columbia:									
Washington	1	1	0	0	0	0	0	3	0
Virginia:									
Lynchburg	0	0	0	0	0	0	0	1	0
West Virginia:									
Charleston	0	0	0	0	0	0	0	2	1
Wheeling	0	0	0	0	0	0	0	1	0
North Carolina:									
Winston-Salem	0	0	0	0	0	2	0	0	0
South Carolina:									
Charleston [1]	0	0	0	0	2	1	0	0	0
Georgia:									
Brunswick	0	0	0	0	0	1	0	0	0
Savannah [2]	0	0	0	0	1	1	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	0	0	0	0	2	1	0	0	0
Nashville	1	1	0	0	0	0	1	0	0
Alabama: [2]									
Birmingham	1	1	0	0	2	0	0	1	0
Montgomery	0	0	0	0	1	0	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	0	0	0	0	1	1	1	0	0
Shreveport	0	0	0	0	0	2	0	0	0
Oklahoma:									
Oklahoma City	1	1	0	0	0	1	0	0	0
Texas: [2]									
Dallas	0	0	0	0	1	1	0	0	0
MOUNTAIN									
Colorado:									
Denver	2	0	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	0	0	0	0	0	0	1	11	0
Spokane	0	0	0	0	0	0	0	3	0
Tacoma	0	0	0	0	0	0	0	1	0
Oregon:									
Portland	1	0	0	0	0	0	0	1	1
California:									
Los Angeles	1	2	0	0	0	0	0	0	0
San Francisco [2]	0	1	0	0	0	0	0	0	0

[1] Dengue; 4 cases at Charleston, S. C.

[2] Typhus fever: 14 cases; 7 cases at Savannah, Ga., 3 cases and 1 death at Tampa, Fla., 2 cases at Mobile, Ala., 1 case at Houston, Tex., and 1 case nonresident at San Francisco, Calif.

The following table gives the rates per 100,000 population for 101 cities for the five-week period ended September 1, 1928, compared with those for a like period ended September 3, 1927. The population figures used in computing the rates are approximate estimates as of July 1, 1928 and 1927, respectively, authoritative figures for many of the cities not being available. The 101 cities reporting cases had estimated aggregate populations of approximately 31,657,000 in 1928 and 31,050,000 in 1927. The 95 cities reporting deaths had nearly 30,961,000 estimated population in 1928 and nearly 30,370,000 in 1927. The number of cities included in each group and the estimated aggregate populations are shown in a separate table below.

Summary of weekly reports from cities, July 29 to September 1, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Aug. 4, 1928	Aug. 6, 1927	Aug. 11, 1928	Aug. 13, 1927	Aug. 18, 1928	Aug. 20, 1927	Aug. 25, 1928	Aug. 27, 1927	Sept. 1, 1928	Sept. 3, 1927
101 cities	[2] 65	78	60	90	[3] 54	80	[4] 64	81	[5] 56	[3] 84
New England	57	63	60	70	48	112	62	86	[6] 32	88
Middle Atlantic	67	92	60	97	55	94	66	78	58	77
East North Central	73	80	73	94	60	85	[7] 67	81	[8] 61	87
West North Central	66	42	58	67	57	44	64	53	51	69
South Atlantic	51	65	49	81	[3] 64	61	[3] 80	88	[3] 67	[3] 89
East South Central	20	30	10	25	40	51	35	61	40	51
West South Central	40	91	52	91	44	74	64	95	100	161
Mountain	25	134	35	179	27	54	[9] 46	134	44	117
Pacific	[2] 84	76	69	107	46	60	41	94	20	73

MEASLES CASE RATES

101 cities	[2] 99	48	58	28	[3] 36	32	[4] 28	25	[5] 21	[3] 21
New England	526	93	248	63	64	84	85	58	[6] 95	58
Middle Atlantic	78	43	51	28	40	34	21	24	16	18
East North Central	84	29	63	19	39	13	[7] 32	13	[8] 29	11
West North Central	14	34	18	22	21	22	16	16	4	16
South Atlantic	56	38	23	14	[3] 30	27	[3] 32	31	[3] 4	[3] 18
East South Central	20	10	25	15	20	5	10	25	10	10
West South Central	0	54	4	21	28	41	0	17	0	41
Mountain	97	45	44	36	44	18	[9] 9	27	18	9
Pacific	[2] 30	144	20	60	8	71	31	52	13	42

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1928 and 1927, respectively.
[2] Seattle, Wash., and Spokane, Wash., not included.
[3] Greenville, S. C., not included.
[4] South Bend, Ind., Greenville, S. C., and Boise, Idaho, not included.
[5] Hartford, Conn., South Bend, Ind., Kenosha, Wis., and Greenville, S. C., not included.
[6] Hartford, Conn., not included.
[7] South Bend, Ind., not included.
[8] South Bend, Ind., and Kenosha, Wis., not included.
[9] Boise, Idaho, not included.

Summary of weekly reports from cities, July 29 to September 1, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

SCARLET FEVER CASE RATES

	Week ended—									
	Aug. 4, 1928	Aug. 6, 1927	Aug. 11, 1928	Aug. 13, 1927	Aug. 18, 1928	Aug. 20, 1927	Aug. 25, 1928	Aug. 27, 1927	Sept. 1, 1928	Sept. 3, 1927
101 cities	[2] 48	51	36	57	[3] 30	50	[4] 33	54	[5] 33	[5] 57
New England	53	51	67	93	39	51	30	81	[6] 70	60
Middle Atlantic	28	35	21	39	20	31	18	37	14	38
East North Central	58	75	42	73	37	78	[7] 44	61	[8] 31	81
West North Central	68	61	68	75	60	63	49	61	55	69
South Atlantic	42	27	26	32	[3] 19	41	[3] 32	63	[3] 30	[3] 60
East South Central	65	51	35	35	25	20	45	86	95	76
West South Central	76	25	36	58	16	50	52	58	44	68
Mountain	27	126	16	117	27	81	[9] 64	63	35	63
Pacific	[2] 68	60	38	63	36	42	33	37	31	34

SMALLPOX CASE RATES

101 cities	[2] 4	6	1	4	[3] 0	5	[4] 2	5	[5] 1	[5] 4
New England	0	0	0	0	0	0	0	0	[6] 0	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	7	9	1	5	1	7	[7] 5	6	[8] 1	7
West North Central	0	0	2	4	0	10	0	4	0	2
South Atlantic	2	9	2	5	[3] 0	4	[3] 0	0	[3] 0	[3] 0
East South Central	15	5	0	0	0	25	0	25	0	0
West South Central	0	17	0	0	0	4	0	0	0	0
Mountain	35	18	0	9	0	18	[9] 9	27	0	36
Pacific	[2] 10	21	8	24	8	13	0	31	5	18

TYPHOID FEVER CASE RATES

101 cities	[2] 22	25	27	25	[3] 27	37	[4] 31	31	[5] 29	[5] 32
New England	5	7	16	30	16	30	16	33	[6] 25	21
Middle Atlantic	17	13	15	15	17	20	23	21	18	28
East North Central	10	9	14	14	18	19	[7] 18	11	[8] 15	15
West North Central	8	26	25	22	41	38	25	20	39	10
South Atlantic	44	58	53	45	[3] 32	81	[3] 50	58	[3] 44	[3] 71
East South Central	110	183	175	96	95	218	165	203	135	183
West South Central	60	50	72	87	96	79	52	74	72	54
Mountain	0	45	9	36	35	27	[9] 64	45	44	54
Pacific	[2] 27	13	15	10	26	31	26	21	26	8

INFLUENZA DEATH RATES

95 cities	6	2	5	3	[3] 3	4	[4] 4	5	[5] 3	[5] 4
New England	2	0	0	2	2	2	2	2	[6] 0	2
Middle Atlantic	6	1	5	2	0	2	3	2	3	3
East North Central	3	0	1	2	4	2	[7] 3	3	[8] 3	5
West North Central	2	2	4	6	0	0	0	2	2	4
South Atlantic	14	5	7	4	[3] 0	5	[3] 9	11	[3] 4	[3] 7
East South Central	0	5	10	5	0	11	0	16	5	5
West South Central	12	4	29	13	29	30	16	21	4	13
Mountain	0	9	9	0	0	0	[9] 0	9	18	18
Pacific	10	3	0	3	10	0	3	7	3	0

[2] Seattle, Wash., and Spokane, Wash., not included.
[3] Greenville, S. C., not included.
[4] South Bend, Ind., Greenville, S. C., and Boise, Idaho, not included.
[5] Hartford, Conn., South Bend, Ind., Kenosha, Wis., and Greenville, S. C., not included.
[6] Hartford, Conn., not included.
[7] South Bend, Ind., not included.
[8] South Bend, Ind., and Kenosha, Wis., not included.
[9] Boise, Idaho, not included.

Summary of weekly reports from cities, July 29 to September 1, 1928—Annual rates per 100,000 population compared with rates for the corresponding period of 1927—Continued

PNEUMONIA DEATH RATES

	Week ended—									
	Aug. 4, 1928	Aug. 6, 1927	Aug. 11, 1928	Aug. 13, 1927	Aug. 18, 1928	Aug. 20, 1927	Aug. 25, 1928	Aug. 27, 1927	Sept. 1, 1928	Sept. 3, 1927
95 cities	52	47	61	55	[3] 55	45	[4] 55	46	[5] 55	[3] 56
New England	57	33	48	77	37	49	44	51	[6] 30	49
Middle Atlantic	60	46	72	57	66	47	68	55	60	72
East North Central	31	44	33	41	43	35	[7] 40	34	[8] 51	51
West North Central	47	43	53	43	31	25	35	31	31	23
South Atlantic	49	52	58	70	[3] 55	52	[3] 60	36	[3] 73	[3] 42
East South Central	68	53	110	69	115	69	84	69	105	48
West South Central	86	68	107	55	57	68	86	64	66	81
Mountain	62	54	71	63	62	36	[9] 46	36	53	54
Pacific	78	62	57	55	61	72	51	62	41	55

[3] Greenville, S. C., not included.
[4] South Bend, Ind., Greenville, S. C., and Boise, Idaho, not included.
[5] Hartford, Conn., South Bend, Ind., Kenosha, Wis., and Greenville, S. C., not included.
[6] Hartford, Conn., not included.
[7] South Bend, Ind., not included.
[8] South Bend, Ind., and Kenosha, Wis., not included.
[9] Boise, Idaho, not included.

Number of cities included in summary of weekly reports, and aggregate population of cities of each group, approximated as of July 1, 1928 and 1927, respectively

Group of cities	Number of cities reporting cases	Number of cities reporting deaths	Aggregate population of cities reporting cases		Aggregate population of cities reporting deaths	
			1928	1927	1928	1927
Total	101	95	31,657,000	31,050,300	30,960,700	30,369,500
New England	12	12	2,274,400	2,242,700	2,274,400	2,242,700
Middle Atlantic	10	10	10,732,400	10,594,700	10,732,400	10,594,700
East North Central	16	16	7,991,400	7,820,700	7,991,400	7,820,700
West North Central	12	10	2,683,500	2,634,500	2,566,400	2,518,500
South Atlantic	21	21	2,981,900	2,890,700	2,981,900	2,890,700
East South Central	7	6	1,048,300	1,028,300	1,000,100	980,700
West South Central	8	7	1,307,600	1,260,700	1,274,100	1,227,800
Mountain	9	9	591,100	581,600	591,100	581,600
Pacific	6	4	2,046,400	1,996,400	1,548,900	1,512,100

FOREIGN AND INSULAR

THE FAR EAST

Report for the week ended August 25, 1928.—The following report for the week ended August 25, 1928, was transmitted by the eastern bureau of the health section of the secretariat of the League of Nations, located at Singapore, to the headquarters at Geneva.

Plague, cholera, or smallpox was reported at the following ports:

PLAGUE

India.—Bombay, Cochin.
Indo-China.—Saigon.

CHOLERA

India.—Bombay, Calcutta, Madras.
French India.—Pondicherry.
Siam.—Bangkok.
Indo-China.—Pnompenh.

SMALLPOX

India.—Bombay, Calcutta, Madras, Negapatam, Moulmein.
French India.—Pondicherry.
Dutch East Indies.—Belawan Deli, Pontianak, Surabaya.
China.—Hong Kong.
Iraq.—Basra.

CANADA

Provinces—Communicable diseases—Week ended August 25, 1928.—The Canadian Ministry of Health reports cases of certain communicable diseases from seven Provinces of Canada for the week ended August 25, 1928, as follows:

Disease	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	Total
Cerebrospinal fever			1				1	2
Influenza				1				1
Lethargic encephalitis			1					1
Poliomyelitis			2	1	16		4	23
Smallpox			8	2		1	21	32
Typhoid fever		9	18	14	3	4	5	53

Ontario Province — Communicable diseases — Comparative — Four weeks ended August 25, 1928.—The Provincial Board of Health of Ontario, Canada, reports cases and deaths from communicable diseases for the four weeks ended August 25, 1928, and the corresponding weeks of 1927, as follows:

Disease	July 29–Aug. 25, 1928		July 31–Aug. 27, 1927	
	Cases	Deaths	Cases	Deaths
Cerebrospinal meningitis	2	1		5
Chancroid			3	
Chicken pox	142		169	
Diphtheria	157	8	175	9
Dysentery	2	3	1	1

Disease	July 29–Aug. 25, 1928		July 31–Aug. 27, 1927	
	Cases	Deaths	Cases	Deaths
Endocarditis				1
Erysipelas			3	
German measles			21	
Goiter	1			
Gonorrhea	152		128	
Influenza	3	5	2	1
Lethargic encephalitis				1
Measles	265	1	205	
Mumps	171		52	
Paratyphoid fever	4			
Pneumonia		24		75
Poliomyelitis	3	1	3	
Scarlet fever	67		123	1
Septic sore throat	2	1	2	
Smallpox	5		69	
Syphilis	89		90	
Tetanus			1	
Tuberculosis	123	73	92	42
Typhoid fever	79	5	141	2
Whooping cough	430	1	297	3

Quebec Province—Communicable diseases—Week ended September 1, 1928.—The Bureau of Health of the Province of Quebec reports cases of certain communicable diseases for the week ended September 1, 1928, as follows:

Disease	Cases	Disease	Cases
Chicken pox	1	Scarlet fever	34
Diphtheria	29	Smallpox	9
Measles	4	Tuberculosis	50
Mumps	8	Typhoid fever	34
Ophthalmia neonatorum	1	Whooping cough	9
Poliomyelitis	2		

GREECE

Dengue.—Under date of September 7, 1928, the health section of the League of Nations reported that the epidemic of dengue fever was decreasing in Athens and Piraeus, but that the disease was spreading throughout Greece.

To September 4, 1928, cases were reported as follows:

	Cases
Darma	1,300
Kalamata	8,000
Kavalla	2,000
Lesbos	4,000
Patras	4,000
Salonica	9,000
Samos	700
Seres	1,500
Syra	3,000
Tripolitza	3,000
Yanina	1,000

Deaths have occurred in elderly persons, neglected cases, and sufferers from chronic diseases. Mosquitoes were said to be plentiful.

Italy and Malta were enforcing quarantine measures against Greece.

A later telegram, dated September 18, 1928, stated that the edidemic of dengue had not extended outside of Greece except to Rhodes and Dodecanese, where 100 cases were reported to September 15. The epidemic in Athens and Piræus was decreasing. The disease was spreading in the Provinces, especially in the south and southeast. There was less dengue in the north.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, health section of the League of Nations, and other sources. The reports contained in the following table must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given:

CHOLERA

[C indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	Week ended— June, 1928 9	16	23	30	July, 1928 7	14	21	28	August, 1928 4	11	18	25
Ceylon: Colombo	C										1							
	D										1							
China:																		
Canton	C			2		1	1			1	2	2	1	3		2	2	
	D			2		1	1			1	2	2	1	3		1	1	
Shanghai	C														2	1	P	
Swatow	C									3	7							
Dutch East Indies:																		
Java—Batavia	C																1	
India	C	12,391	13,236	21,279	32,564	30,177	7,479	8,174	8,028	7,665	9,840	11,184						
	D	6,750	7,282	11,877	20,432	20,162	5,361	5,355	5,054	4,344	5,468	6,005						
Bassein	D	1	2	51	41	40		8										
Bombay	C	1	1	3		1					4		2					
	D		1	3							3		2	6		1	2	
Calcutta	C	203	341	664	446	552	135	133	119	75	65	62	48	31	14			
	D	112	241	442	428	410	83	85	97	58	45	42	26	20	8	11	18	
Madras	C	2	14	10	22	27		3	14	12	13	4	10	45	111	216		
	D	4	18	4	18	16	6	1	5	9	5	3	6	17	56	99	66	
Madras Presidency	C	4,681	2,961	1,483		1,314	978											
	D	2,660	1,618	812		675	460											
Negapatam	C	4	4															
	D	6	4		2					13						1		
Rangoon	C	6	29	22	23	7	8	2	4				1		8	1		
	D	2	18	16	15	5	5	2	2				1		5	2	1	
Tuticorin	C			10	110											1		
	D			9	71													
Vizagapatam	D											4	1	2	6	12	13	

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

CHOLERA—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	Week ended— June, 1928 9	16	23	30	July, 1928 7	14	21	28	August, 1928 4	11	18	25
India (French):																		
Chandernagor	C	6	5	7										2	1	3	3	
	D	1	5	6										1	1	1	1	
Karikal	C	32	6		1										1	6	11	
	D	19	5		1										1	4	10	
Pondicherry	C	12	33	1	8							1		2	8	1		
	D	10	19	1	8							1		2	6		2	2
Indo-China (see also table below):																		
Pnompenh	C										1	2	1	1			1	1
	D										1	2	1	1			1	1
Saigon	C	4	16	96	116	15	5	1					2					
	D	1	8	59	76	9	1						1					
Tourane	C							1										
	D							1										
Kwangchow-Wan (see table below).																		
Persian Gulf:																		
Island of Henjam	C												1					
Jask	C													1				
Philippine Islands:																		
Bulacan Province—																		
Malolos	C													1				
Cagayan Province—																		
Ballesteros	C												1					
	D												1					
Pamplona	C							1										
	D							1										
Sanchez-Mira	C							4										
	D							2										
Cebu (port)	C													1				
Ilocos Norte Province	C										1							
	D										1							

Manila	C											4			1			
Pangasinan Province—																		
Bayambang	C											1						
	D											1						
Siam	C	200	295	291	349	202	51	49	43	60	58	35	10	60				
	D	139	214	218	234	127	36	30	30	48	39	29	7	48				
Ayudhaya	C						2								1	15	2	
	D						1									16	2	
Bangkok	C	101	60	60	74	50	3	3	1		3	5	1		1	1	1	
	D	66	36	33	35	26		2	2			2	1					1
Trad	C							1										
Straits Settlements: Singapore	C	3		2	1													
	D	1		2	1													
On vessel:																		
S. S. Hawaii, Maru at Singapore from Saigon, French Indo-China	C			11														
	D			7														
S. S. Kambangan at Batavia from Jeddah via Sabang and Palembang	C																1	P
S. S. Tairea at Penang from Madras via Negapatam	C																	

Place		July–September, 1927	October–December, 1927	January–March, 1928	April, 1928	May, 1928			June, 1928			July, 1928		
						1–10	11–20	21–31	1–10	11–20	21–30	1–10	11–20	21–31
Indo-China (French) (see also table above):														
Annam	C	3,179	370	389	46	4	26	13	22	8	9	8	5	3
Cambodia	C	251	337	312	196	34	47	20	28	82	111	92	25	38
Cochin-China	C	469	391	1,407	933	140	139	125	143	109	77	65	55	33
Laos	C	246	77											
Tonkin	C	1,297	3	1	6	9	1	16	8	2	1	5	1	1
Kwangchow-Wan	C	16					16						1	

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

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	June 3–30, 1928	Week ended— July, 1928 7	14	21	28	August, 1928 4	11	18	25	September, 1928 1	8
Algeria (see also table below):																	
Algiers	C				1												
Oran	C					1	2										
Arabia: Aden	C	178	343	651	224	7	1										
	D	104	206	529	191	9	1										
Plague-infected rats		P	P														
Argentina:																	
Avellaneda	C					1											
	D					1											
Buenos Aires	C	2				6	1										
	D					3	2										
Cordoba Province	C				5												
Entre Rios	C						5										
Loreto	C					3											
Rosario	C	4	1			1		1									
Sante Fe	C						9	1									
Santiago del Estero	C		1				10	1									
Suardi	C					2											
Azores: St. Michaels Island	C	8	3	3	5	1	1										
	D	4	1	2	2	1	1										
Bolivia: Valle Grande	C											P					
Brazil:																	
Bahia	C	5	24	28	6	3											
	D	4	19	21	6	3											
Porto Alegre	C		1														
Rio de Janeiro	C	4	3	3													
	D	1	2	3													
Plague-infected rats		1															
British East Africa (see also table below):																	
Tanganyiki	C	2	3							4	2						
	D	2	3		10			24		3	2						
Uganda	C	23	13			84	105										
	D	18	10			70	85										

Canary Islands:																	
Arrecife	C					1											
	D					1											
Lanzarote Village	C					1											
Las Palmas	C	1	1	4													
	D	1	1														
Palma Island	C														7		
	D														3		
Teneriffe	C		10														5
	D		4														3
Ceylon: Colombo	C	3	11	7	1	4	2										
	D	2	6	5	1	2	2										
Plague-infected rats		5	6														
China:																	
Amoy	C					5			P								
Hong Kong	C				2		1				1						
	D						1										
Dutch East Indies:																	
Celebes—Makassar	C	5	1														
	D	5	1														
Java	D	737	454														
Batavia and West Java	C	137	103	80	47	65	61	6	7	10	9						
	D	135	103	80	47	65	61	6	7	10	9						
Plague-infected rats				3	7	9	4			1	1			2			
East Java and Madura	C	7		4	4			1									
	D	7		4	4			1									
Kedoe Residency	C				4			P									
Surabaya Residency	C		1	1	1												
	D			1	1												
Ecuador (see also table below):																	
Alausi	C					1											
Egypt:																	
Alexandria	C	2	1			1		2				1	1			1	
	D	2	1			2											1
Amrieh District	C													13	13	4	1
	D															2	2
Assiout Province	C								1	1						1	
	D									1						1	
Beheira	C											1	1				3
Beni-Suef	C				12	79	25	11	3	5	6	1	1	1	3	5	6
	D				3	27	9		1	1	3				2	1	4
Girga	C																3
	D																3
Maghagha District	C				1												
	D				1												
Menufia	C					11											
	D					2											
Minieh Province	C				48	76	76	1	11		1						
	D				9	17	24	1	2								
Port Said	C										1	1					
	D															1	
Sidi Barani	C							10	1		1	10					
	D								7		1	1	1				

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

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	June 3–30, 1928	Week ended— July, 1928 7	14	21	28	August, 1928 4	11	18	25	September, 1928 1	8
Egypt—Continued.																	
Suez	C	4	13	14	5	3											
	D	2	9		13	1											
Plague-infected rats				2													
Tanta	C					1		1			1	1	1				
	D					1											
Greece:																	
Corfu	C						15					1					
	D						3										
Patras	C										1		1				
	D								1								
Hawaii Territory: Hawaii:																	
Hamakua District—																	
Hamakua	D		1														
Plague-infected rats						1							1				
Honokaa—Plague-infected rats						1											
Kukuihaele	D												1				
Plague-infected rats										1							
Kukaiau—Plague-infected rats													3				
Paauilo	D										1		1				
India	C	12,652	23,174	26,079	18,518	3,272	367	79	110								
	D	8,521	16,998	20,907	17,074	3,183	345	50	72								
Bassein	D	8	12	22	13	8	14		1	2							
Bombay	C	14	33	69	43	39	14				1						
	D	9	33	61	69	38	8				1	2	2	1			
Calcutta	D	1		2										2			
Madras Presidency	C	452	271	62	21	12	54	14	21	38							
	D	256	212	48	12	6	25	9	12	20							
Rangoon	C	35	48	30	16	14	31	9	12	11	11	7					
	D	30	43	26	14	15	28	10	11	10	8	7	8	6			
Vizagapatam	D						1										
Indo-China (see also table below):																	
Pnompenh	C							3		1				1			
	D							3		1				1			

Saigon	C						5								1		
	D						1								1		
Plague-infected rats							2										
Iraq:																	
Baghdad	C	4	2	5	11	13	9				1						
	D	2	2	5	6	3	4										
Plague-infected rats					4	3											
Dulafin Liwa	C	1			1												
Kwangchow-Wan (see table below).																	
Madagascar (see also table below):																	
Tamatave	C					1	20	3							1		
	D						8	3									
Nigeria (see also table below):																	
Lagos	C	10	8	7	17	28	43	15	14	14	10	14	12	15	10		
	D	11	8	6	18	28	42	15	14	14	9	15	11	16	10		
Plague-infected rats					8	55	57	23									
Paraguay: Ascuncion	C						5										
	D						2	2									
Peru (see table below).																	
Portugal: Lisbon	C						1										
Senegal (see also table below):																	
Thies and vicinity	C			8		72	52										
	D			4		40	40										
Siam	C	20	42	33	27	15	6	3	6	1							
	D	12	36	30	13	11	7	2	5	1							
Ayudhaya	C						2	2									
	D						1	2									
Bangkok	C	2	1	1	4												
	D	2	1	1	2												
Nagara	C					1	2										
Straits Settlements: Singapore	C	1	3	1													
	D	1	2	1													
Syria (see also table below):																	
Beirut	C						1	2	1	1	1						
Tunisia: Bengardane region	C			8													
	D			6													
Turkey: Adalia	C										1						
Union of South Africa:																	
Cape Province	C	1															
	D	1															
Orange Free State	C	5	5	5				P									
	D	4	1	5													
Union of Socialist Soviet Republics:																	
Astrakhan—																	
Axary District	C						3										
	D						2										
Krasnoiarsk District	D															1	
Chita District	C																1
Venezuela: State of Miranda—Tacata and Cua	C		P														
On vessel: S. S. Tymeric, at Barbados, from New Orleans	C					1											

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

PLAGUE—Continued

[C indicates cases; D, deaths; P, present]

Place		October–December, 1927	January–March, 1928	April, 1928	May, 1928	June, 1928	July, 1928	August, 1928
Algeria (see also table above).								
Algiers	C				1			
Angola	C	3						
British East Africa (see also table above):								
Kenya	C	62	65	17	11	58	97	
	D			5				
Ecuador: Guayaquil	C	18	20		1	5		
	D	5	8			2		
Plague-infected rats		31	75		1	4	7	
Indo-China (see also table above)	C	10	12	9	16			
Kwangchow-Wan	C		18	17	10			
Madagascar (see also table above)	C	692	940	95		104		
	D	605	864	90		94		
Ambositra Province	C	25	202	25	13			
	D	17	191	25	10			
Antisirabe Province	C	109	281	35	14	19		
	D	108	279	34	14	19		
Itasy Province	C	104	55	1				
	D	94	49	1				
Moramanga Province	C	95	56					
	D	83	55					

Place		October–December, 1927	January–March, 1928	April, 1928	May, 1928	June, 1928	July, 1928	August, 1928
Madagascar—Continued.								
Tamatave	C				1	7	22	
	D					7	14	
Tananarive Province	C	408	348	34	20	17		
	D	354	292	30	30	17	4	
Nigeria (see also table above)	C	63	41	18	30			
	D	61	41	17	30			
Peru	C	34	93		20			
	D	11	23		4			
Callao	D	3						
Lima	C	7	6		4			
	D	3			2			
Senegal (see also table above)	C		30	81	216	151		
	D		17	40	115	91		
Rufisque	C				17	29	18	2
	D				9	22	7	
Thies	C			30	72	243	103	78
	D			23	40	174	64	52
Tivaouane	C			51	105	169	84	9
	D			28	57	90	70	
Syria: Beirut (see also table above)	C	2				1	4	

PLAGUE RATS ON VESSELS

S. S. *Modemi* at Goteborg, Sweden, from Bahia and Buenos Aires via Cape Verde Islands, December 22, 1927
S. S. *Gydevore* at Landskrona, Sweden, from Rosario via Canary Islands, January 22, 1928.
S. S. *Dryden* at Liverpool from La Plata River ports, January 20, 1928.
S. S. *Sicily* at Liverpool from Buenos Aires and Rosario, June 8, 1928, 7 plague-infected rats.

SMALLPOX

[C, indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	June 3–30, 1928	Week ended— July, 1928 7	14	21	28	August, 1928 4	11	18	25	September 1	8
Algeria (see also table below)	C	71	72	3	12												
Algiers	C	15	10	5	4	5	15	1		2				2			
Oran	C	11	5	12	17	5	4			5	3	5					
Angola (see table below).																	
Arabia: Aden	C		1				11					1					
	D											1					
Brazil (see also table below):																	
Pernambuco	D					1											
Rio de Janeiro	C			1				1									
	D			1													
British East Africa (see also table below):																	
Kenya—Mombasa	C			2	1												
Tanganyiki	D	5															
British South Africa:																	
Northern Rhodesia	C	233	297	67	628	195	15	4	44			53					
	D	23	42	9	51	17	1		3	2		2					
Southern Rhodesia	C	3	7	7	24	13	36		1	2	19						
	D		1		10		4				4						
Canada:																	
Alberta	C	27	27	47	12	44	9			1	2			4	21		
Calgary	C			1													
Edmonton	C	2	9	7	3				1	1	2						
British Columbia—Vancouver	C	26	10	17	24	11	4	3	2	2	4						
Manitoba	C	1			7	4	10				4						
Winnipeg	C	2															
New Brunswick	C		1			1	7					1	2	2			
Ontario	C	243	147	83	50	41	33			6	5	2		1	2		
Kingston	C	1			3					2					1		
Ottawa	C	68	22	26	4	6	1								1	1	1
Totonto	C	20	14	9	11	12	3				1						
Quebec	C	26	54	112	83	78	81	21	16	12	13	5	9	5	8		
Montreal	C	8	9	9	9	3	11	3	1	1				2		6	
Quebec	C	16	13	10	23	47	52	21	9	7	7	4	3	4			
Sherbrooke	C			3			4										
Saskatchewan	C	97	22	33	52	28	16					4	1		1		
Moose Jaw	C	11	13	7	3	1		1									
Regina	C			3	8	1	1										
Saskatoon	C	15	2														

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

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	June 3–30, 1928	Week ended— July, 1928 7	14	21	28	August, 1928 4	11	18	25	September 1	8
Ceylon: Colombo	C	4	6	1													
	D	1		1													
China:																	
Amoy	C		1	6	9	3											
Antung	C				3												
Canton	C		2	7	2	2											
Chefoo	C			P		P	P	P									
	D		1														
Foochow	C	P	P	P	P		P		P								
Hong Kong	C	2	7	32	25	30	14	3	3	1	4	6	3	6	4		
	D	2	4	19	26	23	19	2	2		1	5	1	5	5		
Manchuria—																	
Changchun	C	4			4	6					1						
Fushun	C						6		1			1					
	D								1								
Harbin	C	5	7	7	10	27	31	7	2	2							
Kwantung	C						14					1					
	D											1					
Dairen	C	15	13	15	16	35	48	4	11	3	3			1			
	D	8	7	8			20	4	4	3	1			1			
Port Arthur	C								1			1					
	D											1					
Mukden	C	4	21	1	4	3	6										
	D						1										
Pensihu	C						1										
	D						1										
South Manchuria Railway Zone	C						5										
Shanghai—																	
Foreigners only	C	5	6	7	3	11	7	1	1			1	1				
Including natives	D	11	19	9	9	19	11	6	4			1		1			
Tientsin	C	48	20	13	17	9	14		1								
Chosen (see table below).																	
Curacao (alastrim)	C	2	3														
Dominican Republic: Santo Domingo	C			2	1												

Dutch East Indies:																	
Balikpapan	C							7									
	D							2									
Belawan Deli	C						11		2		2	5	1	2	1		
	D						3		1			2	1				
Borneo—Pontianak	C		1									3		1	1		
	D												1		1		
Java—																	
Batavia and West Java	C	4	2	5	1	2					2						
East Java and Madura	C	2	9		2		2										
	D		1		2												
Surabaya	C											1	3	2			
	D											1					
Palembang	C								1								
Sumatra—Medan	C	23	14	7	2	10	4		2	1	2	5					
	D	11	2	5	3	5			1	1		2					
Ecuador (see table below).																	
Egypt	C	1	2	52	12	1											
	D			33	7	1											
Behera Province	C								1								
Cairo	C	1															
France (see table below).																	
Gold Coast (see table below).																	
Great Britain:																	
England and Wales	C	1,530	1,473	1,341	1,344	1,199	1,146	182	177	173	149	126	111	114	141		
Birmingham	C	44	3	1	1		2		1								
Bradford	C	24	12	19	14	17	10	2									
Bristol	C	3	4	12	17	10	2								2		
Cardiff	C			5	3	2											
Castleford	C		4	36	69	24	18	2	5	4	3	6	2	1	1		
Hull	C						1	1	20	3		6	2	3	4		
Leeds	C	3	9	14	1		8		1			1					
Liverpool	C		1														
London	C	4	14	17	42	25	96	4	3	9	3	3		5	1		
Manchester	C	25	8	14	8	5	1										
Newcastle-on-Tyne	C	27	12	9	4	12	6		28				1		1		
Nottingham	C	27	11	13	17	20	3	2	1		3		3	5	2		
Plymouth	C													6			
Sheffield	C	8	6	1	14	4	2	1			1			1			
Stoke-on-Trent	C	1	15	12	32	24	14		3		2	4	4				
Weymouth	C								1								
Scotland—Arbroath	C												1				
Greece (see table below).																	
Hedjaz	C	35	115			6	14	8		5	5						
	D	23	46			2	1	1		2	3						
India	C	17,777	18,850	28,034	30,436	21,489	13,497	3,106	2,536								
	D	3,709	3,826	5,540	6,672	5,046	3,760	859	730								
Bassein	C	1			1												
Bombay	C	61	149	218	200	136	71	17	27	11	12	19	13	3			
	D	24	73	120	118	78	46	6	16	6	5	9	8	2			
Calcutta	C	58	71	134	171	130	61	19	15	11	7	10	3	3			
	D	34	50	104	130	101	50	13	10	8	4	9	1	3			

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

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	June 3-30, 1928	Week ended— July, 1928 7	14	21	28	August, 1928 4	11	18	25	September 1	8
India—Continued.																	
Karachi	C		1	1	2	3			2		1						
	D		1		1	1			1		1						
Madras	C	74	100	183	169	59	35	10	11	8	10	9	11	13			
	D	8	19	29	38	18	10	3	4	6	5	2	2	5			
Moulmein	C						1		2	2	5		3	3			
	D						1		1	1	4			2			
Negapatam	C	8	3		7	8	19		2	8	16	4	13	8			
	D	3			3	1	7		1	1	2		1	4			
Rangoon	C	275	377	320	167	36	30	2	1	4		1	1				
	D	64	104	102	79	13	6	1	1	1	1	1					
Tuticorin	C					3											
Vizagapatam	C	10	2	3	2	3	8		2	1				1			
	D	8				1	3		1	2				1			
India (French):																	
Chandernagor	C			5	5						1		2				
	D			1	1						1		1				
Pondicherry	C	47	9	18	36	32	13		3	5	4	4	13	13			
	D	47	9	18	36	23	13		3	5	4	4	11	2	6		
Indo-China (see also table below):																	
Pnompenh	C													2			
	D													2			
Saigon	C		3														
Iraq:																	
Baghdad	C	19	7	5	5	16	16	7	10	2	5		4	2	1	5	7
	D	11	4	4	3	6	10	3	6	2	4		1	1		2	5
Basra	C	1	7	5	4	3	2	6							2		1
	D			2	2	2	2	2							1		1
Italy:																	
Leghorn	C		1	1													
Palermo	C			5	10	6	10			4		6					
Rome and vicinity	C	3															
Ivory Coast (see table below).																	
Jamaica (outside Kingston) (alastrim)	C	5	10	13	4	2	3	1							1		

Japan:																	
Kobe	C					11											
Nagoya	C				6	2					1						
Osaka	C						4										
Tokyo City	C	4	4	15	8	2											
	D	1	2	1	1												
Tokyo prefecture (outside city)	C			24	1	1											
	D			1	2												
Yokohama	C				2	3											
	D					1											
Latvia (see table below).																	
Mauretania	C		P														
Mexico (see also table below):																	
Acapulco	C					2											
	D					2											
Jalisco (State)	C		P	P	P		21										
Guadelajara	D		1	2	12	13	10	1	1	3	4	1	4		2	1	
Manzanillo	D			1													
Mazatlan	D					3	2							3			
Mexico City and surrounding territory	C	2	1		1	2		1	2								
	D						1										
Reynosa	C									1							
Saltillo	D					2	2										
Tampico	C		1														
Morocco (see table below).																	
Nigeria (see also table below):																	
Lagos	C			1			1										
Southern Provinces	C		7	93			51										
	D			35			12										
Palestine: Jerusalem	C	1															
	D	1															
Persia (see table below).																	
Poland	C	3	1	1	9	1	3			2							
	D				1												
Portugal (see also table below):																	
Lisbon	C	12	20	5	6	7	7	3	1	1	3						
	D		1								1		1				
Oporto	C				1												
Senegal (see also table below): Dakar	C		34	29	16	29	8										
	D			20	8	7											
Siam	C	35	12	28	10	8	3	1									
	D	4	3	4	3	1	1										
Bangkok	C				1												
	D					1											
Spain (see also table below): Valencia	C		1	2													
Straits Settlements: Singapore	C	1	1	1	3		1										
Sudan (Anglo-Egyptian)	C	85	109	332	160	168	206	32	63		49	31	78	78	65	56	35
	D	48	27	100	32	20	37	5	18		12	9	6	6	13	7	6
Sudan (French) (see table below).																	
Syria (see table below).																	
Taiwan: Keelung	C						1										
Tunisia: Tunis	C	3	14	4	6	3	2	5		1		4					

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

SMALLPOX—Continued

[C indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	June 3–30, 1928	Week ended— July, 1928 7	14	21	28	August, 1928 4	11	18	25	September 1	8
Union of South Africa:																	
Cape Province	C	P															
Natal	C	P	P	P			1										
Orange Free State	C	P		P		P	P	P									
Transvaal	C				P	P	P										
Union of Socialist Soviet Republics (see table below).																	
Upper Volta	C		5	2	9								33				
	D												8				
Venezuela: Maracaibo	C	1															
	D	1	1										1				
On vessel:																	
S. S. Arendskerk at Singapore, from Amoy, China	C			P													
S. S. Kashgar at Kobe, from Shanghai	C				P												
S. S. Ronna at Penang, from Negapatam	C					P											
S. S. Theseus, from Jeddah to Penang	C								1								
S. S. Tjileboet at Hong Kong, from Shanghai	C				P												
S. S. Yarmouth at Kingston, Jamaica, from Habana, Cuba	C			1													
S. S. Victoria at Nome, Alaska	C						8										

Place		October–December, 1927	January–March, 1928	April, 1928	May, 1928 1–10	11–20	21–31	June, 1928 1–10	11–20	21–30	July, 1928 1–10	11–20	21–31	August, 1928 1–10	11–20
Algeria (see also table above)	C	682													
Oran	C	11													
Indo-China (French) (see also table above)	C	97	426	35	36	6	37	47		36	8	3	15	44	
Ivory Coast	C					7						4	5		
	D												2		

Senegal (see also table above)	C			51			20	23	14	2							
	D			7			9										
Dakar	C			11	12	7	5	4	1	3							
	D			8	4	3											
Sudan (French)	C		15	4	30	P	P	20				17					
	D				6												
Syria:																	
Aleppo	C	1	1						1	2							4
Beirut	C	2	75	9	2	3	2	1	7	2	4	1					
	D		2														
Damascus	C	47	14														

Place		October–December, 1927	January–March, 1928	April, 1928	May, 1928	June, 1928	July, 1928
Angola	C	151	47	7	1		
	D	2					
Congo	C	77	36				
Cuanza-Norte	C		1				
Cuanza-Sul	C	9	10				
Zaire	C	5					
Brazil (see also table above): Porto Alegre	C	5	1				
British East Africa (see also table above):							
Zanzibar	C	2					
	D	1					
Chosen	C	4	48	20	152		
	D	1	16	6	38		
Seoul	C		1				
Ecuador: Guayaquil	C	6	35	19	31	11	35
	D		1				
France	C	25	34	6	15	10	
Gold Coast	C	4	4				

Place		October–December, 1927	January–March, 1928	April, 1928	May, 1928	June, 1928	July, 1928
Greece	C	9	36	1	22	31	9
	D		4		1	2	1
Latvia	C	2	1				
Mexico (see also table above)	D	346	256				
Morocco	C	622	132	19	25	10	55
Nigeria (see also table above)	C	316	592				
	D	81	84				
Persia	D	2	7				
Portugal (see also table above)	C		258		98	74	
	D		30		9	3	
Spain (see also table above)							
Madrid	D	1					
Union of Socialist Soviet Republics:							
Railways, etc	C	33	59				
Other territories in Europe	C	1,255	1,717				
Transcaucasus, Siberia, and Central Asia	C	81	25				
Ukraine	C	48	27				

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

TYPHUS FEVER

[C indicates cases; D, deaths; P, present]

Place		Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	Week ended— June, 1928				July, 1928				August, 1928				September, 1928	
							9	16	23	30	7	14	21	28	4	11	18	25	1	8
Algeria (see also table below):																				
Algiers	C	1	3	9	4	13	28	1	2	1	1	----	2	----	1	4	3	----	----	----
	D		1		2		6													
Oran	C	2	10	4	11	4	5	1	----	1	2	6	6	2	1	1	1	----	----	----
	D				1			1												
Austria: Vienna	C	1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Bulgaria (see also table below):																				
Kustendil Department	C	----	----	----	----	----	----	----	----	----	2	----	----	----	----	----	----	----	----	----
Sofia	C	1	----	20	1	20	3	10	1	----	1	----	----	----	----	----	----	----	----	----
	D						2	3	1											
Chile:																				
Iquique	C	----	----	----	----	----	----	----	----	----	----	----	----	1	----	----	----	----	----	----
	D	----	----	----	----	----	----	----	----	----	----	----	1	----	----	----	----	----	----	----
Talcahuano	D	----	----	1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Valparaiso	C	----	1	----	----	----	----	1	----	----	----	----	2	----	----	----	----	----	----	----
	D	----	----	----	----	----	2	1	----	----	----	----	----	----	----	----	----	----	----	----
China (see also table below):																				
Manchuria—																				
Harbin	C	----	----	----	2	16	7	9	4	3	----	----	----	----	----	----	----	----	----	----
Kwantung	C	----	----	----	17	293	135	223	181	----	----	213	138	----	60	----	----	----	----	----
South Manchuria Railway Zone	C	----	----	----	----	----	----	7	3	----	----	5	1	----	----	----	----	----	----	----
Tientsin	C	----	----	----	----	2	----	----	----	2	----	----	----	----	----	----	----	----	----	----
Chosen (see table below).																				
Czechoslovakia (see table below).																				
Egypt	C	9	17	2	3	11	----	----	7	----	----	----	----	----	----	----	----	----	----	----
	D	2	8	1	1	2	----	----	3	----	----	----	----	----	----	----	----	----	----	----
Alexandria	C	----	----	----	----	----	----	----	----	----	----	1	----	----	1	----	----	----	----	----
Assiout Province	C	----	----	----	----	----	1	----	----	1	1	1	----	----	----	----	----	----	----	----
Assouan Province	C	----	----	----	----	----	1	----	----	1	----	----	----	----	----	----	----	----	----	----
Behera Province	C	----	----	29	32	43	3	----	3	1	2	----	----	----	----	----	----	----	----	----
	D	----	----	----	7	7	2	----	----	----	----	----	----	----	----	----	----	----	----	----
Cairo	C	----	----	2	4	----	----	----	----	----	----	1	----	----	----	----	----	----	----	----
	D	----	----	1	4	----	----	----	----	----	----	1	----	----	----	----	----	----	----	----
Dakalieh	C	----	----	----	----	----	1	----	----	----	1	----	----	----	----	----	----	----	----	----
Gharbieh Province	C	----	----	23	14	5	2	----	----	2	----	1	----	----	----	----	----	----	----	----
	D	----	----	----	5	----	1	----	1	1	----	----	----	----	----	----	----	----	----	----

Keneh Province	C			5	38				1											
	D				7				1											
Menoufieh Province	C				28	9	3		1	1										
	D				3	3	1		1											
Port Said	C											1	1			4	3	1		
Suez	C					1						1	1	2	1	1	1	1		1
	D					1														
Great Britain: London County	C						1	1												
Greece: Piræus	C								1											
Hungary: Budapest	D								2					2						
Ireland:																				
Belfast	C					2	1													
	D						1													
Irish Free State	C	1			1	4														
Cork County	C				1															
Galway County—Oughterard	C													10						
Kerry County—Cahirciveen	C														1					
Japan (see table below):																				
Hiogo	C								1											
Yamagata	C					2		2				1	1							
Latvia (see table below).																				
Lithuania (see table below).																				
Mexico (see also table below):																				
Durango	D										1									
Guadalajara	D					1														
Mexico City, including municipalities in Federal District	C	5	8	12	8	19	4	3	5	2	6	2	1	1	4	2				
	D	4	4	3	1	2					2		1		2					
Monterey	D			1																
Morocco (see also table below)	C	1,051	316	748	591	280	40	44	55	75	40	50	49	14	39	2				
Palestine	C	5	10	7	6	4	2	1	3	2	1	3	3		2	3	3	2	2	2
Peru (see table below).																				
Poland	C	346	265	382	144	226	28	39	35	32	25	30	15	26	7	19				
	D	19	26	25	12	17		3	2	1	1		2	2						
Portugal (see also table below): Oporto	C	1									1									
Rumania	C	39	68	141	142	99	36	21	18	5	8	8	8	9	8					
	D	9	5	11	12	8	6	4	1			1			1					
Syria (see also table below): Aleppo	C							2												
Tunisia	C	4	1	18	19	7		4	3											
Union of South Africa:																				
Cape Province	C	1	P		P	P		P	P	P	P	P	P	P						
Natal	C	1	2		P	3		P		P	P	P	P	P						
Orange Free State	C	P			P	P		P	P	P	P	P	P	P						
Transvaal	C					1														
Union of Socialist Soviet Republics (see table below).																				
Yugoslavia (see table below).																				
On vessel S. S. Gaika at Durban, Natal, from Mauritius	C		1																	

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

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		1927 July–September	1927 October–December	January–March, 1928	April, 1928 1–10	April, 1928 11–20	April, 1928 21–30	May, 1928 1–10	May, 1928 11–20	May, 1928 21–31	June, 1928 1–10	June, 1928 11–20	June, 1928 21–30	July, 1928 1–10	July, 1928 11–20	July, 1928 21–31	August, 1928 1–10	August, 1928 11–20
Algeria (see also table above)	C	110	12															
	D	13	1															
Algiers	C	10	2															
Bulgaria (see also table above)	C	43	4	39				26			16				1	3		3
	D	3	2	6							2							2
Morocco (see also table above)	C	231	123															

Place		January–March, 1928	April, 1928	May, 1928	June, 1928	July, 1928	August, 1928
Chosen	C	896		241	24		
	D	88		32	2		
Chemulpo	C	2		2			
Gensan	C	1					
	D	1					
Seoul	C	10	28	18			
	D	1	2	4			
Czechoslovakia	C	25					
Greece: Athens	C	4	13	11	9	6	
	D		2	2	1	1	
Japan	C			21			
Latvia	C	27	4	65	2		
Lithuania	C	223	66	64	10	8	11
	D	22	3	3			

Place		January–March, 1928	April, 1928	May, 1928	June, 1928	July, 1928	August, 1928
Mexico (see also table above)	D	46					
Peru:							
Arequipa	D	2	1				
La Oroya	C	P					
Turkey	C	17		7	2	6	2
	D	1		1			
Union of Socialist Soviet Republics:							
Railways, etc	C	199					
Transcaucasus, Siberia, and Central Asia	C	17					
Ukraine	C	1,476					
Other territories in Europe	C	5,167					
Yugoslavia	C	34	10	19	16	12	
	D	3	1	3	1	3	

YELLOW FEVER

[C indicates cases; D, deaths; P, present]

Place		Nov. 20–Dec. 17, 1927	Dec. 18, 1927–Jan. 14, 1928	Jan. 15–Feb. 11, 1928	Feb. 12–Mar. 10, 1928	Mar. 11–Apr. 7, 1928	Apr. 8–May 5, 1928	May 6–June 2, 1928	June 3–30, 1928	Week ended— July, 1928				August, 1928				September, 1928	
										7	14	21	28	4	11	18	25	1	8
Belgian Congo:																			
Boma	C		3																
	D		2																
Matadi	C		29	14	1		2	2											
	D		16	13															
Brazil:																			
Aracaju	D							2											
Bahia	C								4										1
	D															1			1
Estancia	C				1														
Pernambuco	C								1										
Rio de Janeiro	C							2	48	10	12	10	8	6	4	4			4
	D							2	15	5	7	9							
Sao Felix	C								P										
Dahomey: Grand Popo	C	1							3										
	D								2										
Gold Coast	C	1						2											
Ivory Coast	C		1						1										
	D		1						1										
Abidjan	C								1	1									
Ferkes-Sedougou	D													1					
Senegal: Dakar	C	7	2																
	D	7	2																