# PUBLIC HEALTH REPORTS

VOL. 44 MARCH 15, 1929 NO. 11

## RAT-FLEA SURVEY OF THE PORT OF NORFOLK, VA.

By H. E. HASSELTINE, *Surgeon, United States Public Health Service*

This report is one of a series of reports of rat-flea survey work done by the United States Public Health Service at different United States ports for the purpose of obtaining and recording data that might be useful in determining the bubonic-plague hazard at such ports.

One of the questions that has perplexed every American sanitarian who has been concerned with the prevention of the introduction of bubonic plague and the eradication or control of the disease when once introduced into the United States is, "Why have some of our largest and busiest seaports escaped infection, while others have become infected?" Thirty years ago the same question was being asked in reference to yellow fever, and scientific observation and research have evolved the correct answer in the case of yellow fever.

Robertson (1) suggests that the answer to this question lies in a seasonal variation, dependent upon climatic conditions, in the rat-flea prevalence at different ports; that is, ports having cold winter temperatures have a marked diminution of fleas in the cold weather and thereby escape plague epizootics. This observation is quite analogous to the well-known fact that yellow fever always ceases with the onset of freezing weather, though the infection-halting temperature line is less sharply marked when plague and its flea host are considered than it is in case of yellow fever and its mosquito host.

Since the discovery of the specific cause of plague in 1894, science has gradually accumulated evidence which establishes, beyond doubt, that plague (bubonic type) is essentially a disease of rodents and only accidentally a disease of man; that of all rodents the rat is the most prominent international carrier of infection from place to place; and that ectoparasites, particularly fleas, are the means by which plague is accidentally carried from rat to man. The observations of Cragg (2) and Hirst (3) indicate that *Xenopsylla cheopis* is the predominating rat flea in those parts of India that suffer from epidemic plague, and that under natural conditions probably only this species is a carrier of plague infection. Grubbs (4), under whose direction the survey reported herein was begun, while recognizing that plague may be transmitted by other species of fleas under exceptional

conditions, believes that, from a practical standpoint, *Xenopsylla cheopis* is the only flea that need be considered in the transmission of plague from rat to rat under natural conditions, and advocates the adoption of the *Xenopsylla cheopis* index as a measure of infectibility of any community. He holds that this index should be the average number of *Xenopsylla cheopis per live rat* in the locality under consideration.

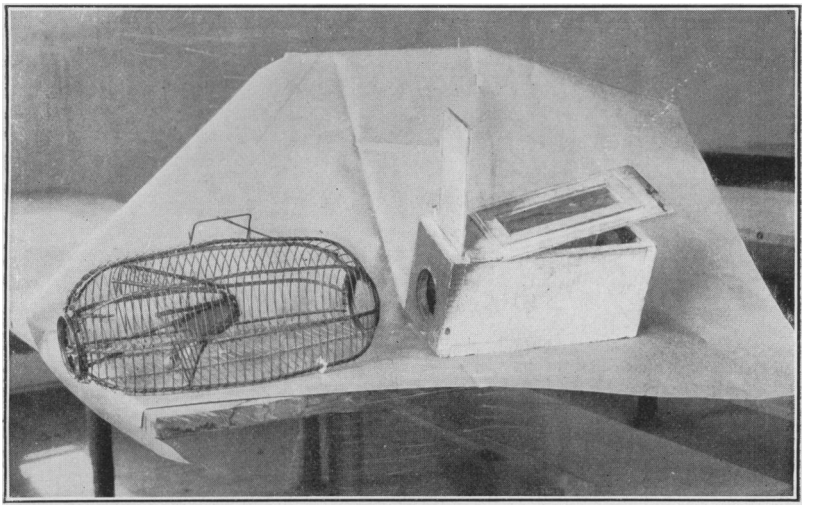
At the present time, measures designed to prevent the introduction of bubonic plague constitute a large part of the quarantine activities of the United States Public Health Service. Mindful of the vast amount of expense and inconvenience that resulted from anti-yellow-fever measures in the days when our knowledge of the disease was limited, we are now seeking ways and means of making our anti-plague measures more effective and less expensive.

To this end, rat-flea surveys are being carried on in various ports of the United States to determine the relative number of each species of fleas harbored by rats in each of such ports and, using these figures as an indicator of infectibility or noninfectibility, to ascertain at what points there is danger of the spread of bubonic plague, if the disease gains entrance. Similar work in various ports of the Western Hemisphere is advocated by the Pan American Sanitary Bureau, and the work reported herein has been carried on as nearly as possible under the conditions laid down by the Committee on Plague of the Pan American Sanitary Bureau (5). The data reported herein relate to the port of Norfolk, Va.

## METHODS

The survey in Norfolk began on March 16, 1927, and terminated on March 30, 1928. Live rats were caught in wire cage traps, and transported to the laboratory in the traps in which they were originally captured. The traps were disturbed as little as possible during transportation. In stormy weather they were covered with canvas or other suitable material, but the traps were not placed inside sacks during transportation to the laboratory. The procedure followed was the same as that followed in New York (6), San Juan, Porto Rico (7), and other ports, except that the rats were killed by choloroform and immediately combed, instead of being killed by methods using mechanical violence and then hung over water.

A small box with a removable top, in which a small piece of window glass was set, was used as a chloroforming chamber. In one end of the box a round hole was cut, which could be closed by a sliding partition, through which rats could pass from a cage trap; at the other end of the box was a piece of gauze saturated with chloroform. The interior of the box was at first painted white, but later it was lined with white paper, which was renewed when necessary. As soon as a



Box for killing rats by chloroform. When in use, the trap and box are placed end to end

rat had entered the box, the slide was dropped, and the opening of the trap was closed if there was more than one rat in the trap. Only one rat was chloroformed at a time. In this box approximately 1,500 rats were chloroformed with less than half a dozen escapes. As soon as the rat was dead, as observed through the glass window, it was removed from the box and a heavy forceps was clamped about the neck to prevent resuscitation, following which it was combed for fleas on a table covered with white paper. After removal of each dead rat, the box was inverted over the paper and rapped sharply to shake out any fleas that might be in the box. The next rat was introduced into the box and chloroformed while the first rat was being combed.

The advantages of this method over mechanical violence and hanging over water are as follows: (*a*) The fleas, as well as the rats, are killed by chloroform and no fleas escape; (*b*) all work on the body of the rat is completed before putrefaction begins; (*c*) it was found to save time, for in using the hanging-over-water method at the beginning of the survey, it was found necessary to comb the rats in order to make sure of getting all fleas.

Fleas and other ectoparasites were preserved in 80 per cent alcohol and examined, without clearing, under the microscope. The parasites were then returned to the 80 per cent alcohol and forwarded to the New York Quarantine Station laboratory, where they were cleared, mounted, and identified. The identification results reported by the New York laboratory are used as the basis of figures given in this report. Comparison with the findings of the Norfolk laboratory shows that the species of only six of the 4,898 fleas would have been reported differently had the Norfolk results been used. Each rat was autopsied, but no evidence of plague was found.

The entire survey was carried on by personnel of the United States Quarantine Station, Fort Monroe, Va., the rat laboratory being located at the detention division of the station on Craney Island. One employee attended the traps, killed and autopsied the rats, and collected the parasites under the supervision of the medical officer in charge.

## DISTRIBUTION OF RATS

The total recorded number of trap-days was 18,798, making the daily average number of traps 53. This average is based on 355 trapping days when the regular trapper was on duty. The records of number of trap-days on the remaining 25 days, when substitute trappers were on duty, were found incomplete, and so they have been disregarded. It is not believed that the average number of traps per day would be appreciably increased or decreased if the records for those 25 days could be used. Three hundred and ninety-

nine premises were trapped for one or more days. Rats were captured on 197 of these premises.

The total rat yield for the 380-day period was 1,561 rats, an average of 8.3 rats per hundred trap-days. Four rats were classified as *Rattus rattus rattus*, and the remaining 1,557 as *Rattus norvegicus*. Of the rats captured, 677 were males and 884 females; of the latter, 217 were found pregnant, the number of fetuses totaling 1,956, an average of approximately 9 fetuses per pregnant female. The largest number of fetuses found in any one rat was 14. Table 1 shows the distribution of rats by months.

TABLE 1.—*Distribution of rats by months*

| Month | Total number of rats | Rattus norvegicus | | | | | | | | Rattus rattus rattus | | | | | | | | Percentage of rats having fleas |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Adult male | Young male | Total male | Adult female | Young female | Total female | Pregnant female | Number of fetuses | Adult male | Young male | Total male | Adult female | Young female | Total female | Pregnant female | Number of fetuses | |
| 1927 | | | | | | | | | | | | | | | | | | |
| March | 57 | 16 | 4 | 20 | 30 | 7 | 37 | 13 | 110 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 35.1 |
| April | 221 | 63 | 27 | 90 | 97 | 34 | 131 | 43 | 384 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 30.3 |
| May | 171 | 35 | 35 | 70 | 51 | 50 | 101 | 20 | 172 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 58.5 |
| June | 187 | 57 | 31 | 88 | 60 | 39 | 99 | 25 | 215 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 57.8 |
| July | 216 | 79 | 31 | 110 | 74 | 31 | 105 | 19 | 176 | ---- | ---- | ---- | 1 | ---- | 1 | 0 | ---- | 54.2 |
| August | 122 | 51 | 7 | 58 | 54 | 10 | 64 | 18 | 163 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 75.4 |
| September | 118 | 51 | 9 | 60 | 48 | 10 | 58 | 10 | 89 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 55.1 |
| October | 129 | 32 | 17 | 49 | 55 | 24 | 79 | 23 | 230 | ---- | ---- | ---- | 1 | ---- | 1 | 1 | 10 | 77.5 |
| November | 83 | 31 | 9 | 40 | 32 | 11 | 43 | 13 | 112 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 75.9 |
| December | 72 | 28 | 5 | 33 | 27 | 11 | 38 | 7 | 65 | ---- | ---- | ---- | 1 | ---- | 1 | 0 | ---- | 56.9 |
| 1928 | | | | | | | | | | | | | | | | | | |
| January | 59 | 19 | 2 | 21 | 27 | 10 | 37 | 5 | 49 | ---- | 1 | 1 | 0 | ---- | 0 | 0 | ---- | 54.2 |
| February | 62 | 13 | 3 | 16 | 42 | 4 | 46 | 10 | 92 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 66.1 |
| March | 64 | 13 | 8 | 21 | 23 | 20 | 43 | 10 | 89 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 57.8 |
| Total | 1,561 | 488 | 188 | 676 | 620 | 261 | 881 | 216 | 1,946 | ---- | 1 | 1 | 3 | ---- | 3 | 1 | 10 | 56.6 |

Throughout the survey it was found that the vast majority of the premises trapped in Norfolk presented very favorable conditions for harborage and propagation of rats. Many buildings antedate the use of concrete for structural purposes, and, considering the city as a whole, very little rat-proof construction has been done. Some of the more recently built structures are relatively rat proof, but these are scattered among numerous old buildings that offer excellent rat harborage. Food for rats is abundant, particularly in the colored residential sections. Many families maintain chickens in the back yard, and kitchen garbage is thrown into the chicken yard. Under such conditions nothing but a marked rat infestation can be expected.

The city was divided into four zones as follows: Zone 1, the docks; zone 2, the water front, including all premises within two blocks of the water front; zone 3, commercial district; zone 4, remainder of the city. The line drawn between zones 3 and 4 was necessarily an arbi-

trary one, as certain streets extend commercial activities for considerable distances into residential sections, while, on the other hand, there are many residences, particularly of the poorer class, within the limits of zone 3. One *Rattus rattus rattus* was captured in each zone.

### DISTRIBUTION OF FLEAS

Table 2 shows the rat and flea catches by zones.

TABLE 2.—*Distribution of rats and fleas by zones*

| Zone | Number of premises trapped | Total trap days | Number of rats caught | Rats per 100 trap-days | Fleas recovered | | | | | | Total number of fleas per rat | Number of C. fasciatus per rat | Number of X. cheopis per rat |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | X. cheopis | C. fasciatus | L. musculi | Ct. canis | E. gallinacea | Total number of fleas recovered | | | |
| 1 | 21 | 1,976 | 74 | 3.74 | 8 | 78 | 0 | 1 | 0 | 87 | 1.18 | 1.05 | 0.108 |
| 2 | 43 | 2,953 | 77 | 2.61 | 359 | 63 | 0 | 7 | 0 | 429 | 5.57 | .82 | 4.66 |
| 3 | 162 | 4,210 | 593 | 14.09 | 2,043 | 409 | 6 | 12 | 0 | 2,470 | 4.17 | .69 | 3.44 |
| 4 | 173 | 9,659 | 817 | 8.46 | 1,589 | 314 | 0 | 8 | 1 | 1,912 | 2.34 | .38 | 1.94 |
| Total | 399 | 18,798 | 1,561 | 8.30 | 3,999 | 864 | 6 | 28 | 1 | 4,898 | 3.14 | .55 | 2.56 |

Eight hundred and eighty-three rats (56.6 per cent) harbored fleas, and a total of 4,898 fleas was recovered from these rats. Of this number of fleas, 3,999 (81.6 per cent) were *Xenopsylla cheopis*, 864 (17.7 per cent), *Ceratophyllus fasciatus*, and the remaining 0.7 per cent was made up of other species, chiefly *Ctenocephalus canis* (or *felis*).

Considered by zones, the greatest number of fleas per rat was found in zone 2 (5.56), followed in order by zone 3 (4.17), zone 4 (2.34), and zone 1 (1.18). Table 3 shows the rat and flea catch by months, and the total flea index and the *cheopis* and *fasciatus* indices for each month.

The greatest number of fleas found on one rat was 64. In the whole survey female fleas predominated, 2,663 female and 2,235 male fleas being taken and identified. The disproportion of the sexes was most noticeable in *Ceratophyllus fasciatus*, there being 579 females and 285 males. Practically the same proportion (19 females to 9 males) was found in *Ctenocephalus canis* (or *felis*), though their total number was small.

For practical purposes the total flea index is the sum of the *Xenopsylla cheopis* and *Ceratophyllus fasciatus* indexes, as only 35 fleas belonged to other species. As over 80 per cent of the fleas captured were *Xenopsylla cheopis*, the total flea index curve necessarily follows closely the *Xenopsylla cheopis* curve, although, of course, slightly higher. Since the *Xenopsylla cheopis* index is the figure of greatest

interest to sanitarians, this index will be used hereafter in the discussions in the report.

TABLE 3.—*Rat and flea catch by months*

| Month | Number of rats caught | Number of rats having fleas | Fleas | | | | | Total number of fleas | Total flea index | Fasciatus index | Cheopis index |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | X. c. | C. f. | C. t. c. | L. m. | E. g. | | | | |
| 1927 | | | | | | | | | | | |
| March | 57 | 20 | 1 | 48 | | | | 49 | 0.86 | 0.84 | 0.018 |
| April | 221 | 67 | 45 | 126 | | 2 | | 173 | .78 | .57 | .20 |
| May | 171 | 100 | 107 | 181 | | 4 | | 292 | 1.71 | 1.06 | .63 |
| June | 187 | 108 | 529 | 118 | | | | 647 | 3.46 | .63 | 2.83 |
| July | 216 | 117 | 660 | 48 | 13 | | | 721 | 3.34 | .22 | 3.06 |
| August | 122 | 92 | 1,023 | 9 | 9 | | | 1,041 | 8.53 | .074 | 8.39 |
| September | 118 | 65 | 369 | 12 | 4 | | | 385 | 3.26 | .102 | 3.26 |
| October | 129 | 100 | 611 | 26 | 2 | | 1 | 640 | 4.96 | .202 | 4.74 |
| November | 83 | 63 | 322 | 58 | | | | 380 | 4.58 | .70 | 3.88 |
| December | 72 | 41 | 129 | 46 | | | | 175 | 2.43 | .64 | 1.79 |
| 1928 | | | | | | | | | | | |
| January | 59 | 32 | 103 | 32 | | | | 135 | 2.29 | .54 | 1.75 |
| February | 62 | 41 | 79 | 82 | | | | 161 | 2.60 | 1.32 | 1.27 |
| March | 64 | 37 | 21 | 78 | | | | 99 | 1.55 | 1.22 | .34 |
| Total | 1,561 | 883 | 3,999 | 864 | 28 | 6 | 1 | 4,898 | 3.14 | .55 | 2.56 |

Chart 1 shows average relative humidity of Norfolk for a period of more than 10 years, the average mean temperature and average relative humidity for the period of the survey, the number of rats caught, and the *cheopis* and *fasciatus* indexes for each month of the survey. It will be noted that in this survey, as in surveys made elsewhere, the *cheopis* index curve follows fairly closely that of humidity. The humidity curve represents the average of the mean humidity figures given for each month by the United States Weather Bureau, at Norfolk. Humidity observations are made at 8 a. m., noon, and 8 p. m., and the mean of daily observations at each of these hours during the month is reported. One-third of the sum of these three reported mean humidities is represented by the humidity curve in Chart 1. When compared with the normal relative humidity for the locality, it is found that the humidity was below normal during the period of the survey, the departure from normal being greatest in January, 1928. In this survey the *cheopis* index curve has also followed the mean temperature curve within reasonable limits.

Although zone 2 shows the highest *cheopis* index when entire zones are considered, certain areas in zones 3 and 4 show a higher index. There was one area in zone 3, consisting of four adjoining blocks, that showed over seven *Xenopsylla cheopis* per rat, over one-fourth of the *Xenopsylla cheopis* captured in the whole survey coming from 150 rats caught in this section. One lunch room in this area yielded 42 rats which harbored 512 *Xenopsylla cheopis*, an average of 12.19 fleas per rat. While it serves no particular purpose to designate these foci in a report covering the city as a whole, knowledge of the

location of such flea foci may be of value to the health authorities in case the port has the misfortune of becoming infected with plague. Knowledge of such foci will indicate where antiplague measures should be applied first and with the greatest vigor.

One young opossum (*Didelphys virginiana*) was captured on June 23, 1927, in a cage trap set in zone 1. This animal was found to harbor 19 fleas, all *Ceratophyllus fasciatus*, which are not included in the nu-

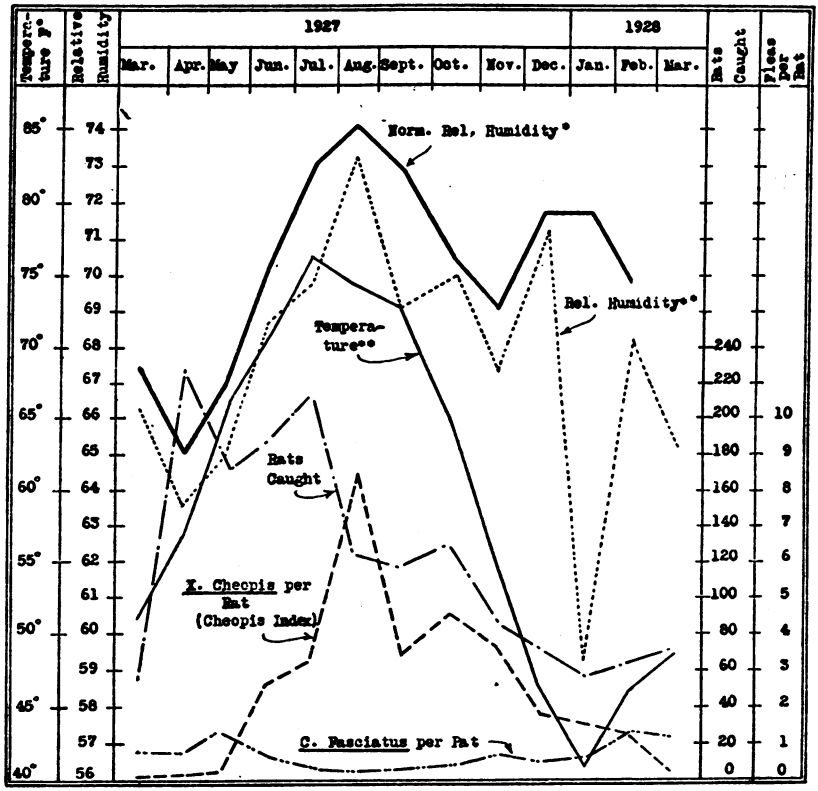



CHART 1.—Graphs showing the temperature, average relative humidity, number of rats caught, and number of fleas per rat at Norfolk, Va.

merical data given in this report. During the period of the survey, 34 rats were captured on the same premises, and these rats yielded a total of 64 fleas (4 *Xenopsylla cheopis*, 59 *Ceratophyllus fasciatus*, and 1 *Ctenocephalus canis*).

## COMPARISON OF RESULTS WITH OTHER PORTS

When compared with other ports where similar surveys have been made, we find the *cheopis* index of Norfolk distinctly higher than that of Boston or New York, ports that have not been visited by plague,

and which have a lower mean temperature, especially during the winter months. The index is considerably lower than that of San Juan, Porto Rico, a tropical port which has suffered from plague, and slightly lower than that of New Orleans, which also has had plague infection and has a mean temperature in the winter months higher than that of Norfolk. There is no record of plague ever having been present in Norfolk. In view of the number of rats and *Xenopsylla cheopis* fleas in Norfolk in the summer months, June to November, one would expect plague to spread if once introduced. The port must, therefore, be considered infectible until we have further information as to the exact critical *cheopis* index above which it may be expected that plague would spread. The degree of infestation of the rats of Norfolk with *Xenopsylla cheopis* differs from that of New Orleans in one respect: In New Orleans, *Xenopsylla cheopis* is the prevailing flea throughout the year, while in Norfolk it predominates during only eight months of the year. Whether this extremely marked reduction of the number of *Xenopsylla cheopis* in the winter months has been a factor in preventing the appearance of plague in Norfolk can not be stated at the present time. It is in accord with Robertson's (1) observations already referred to.

It has been observed in this survey that few rats were caught on docks that extend out into the harbor and allow ships to tie up on each side of the dock. A greater number of rats have been taken on docks that use only one side for the mooring of ships, the other side communicating in its entirety with the land. This latter style of dock is commonly found at river ports, and a few docks of Norfolk are of this type. Most of the Norfolk docks at which foreign ships tie up are of the long projecting type, and a majority of them are of recent construction, having concrete floors and steel or concrete warehouses. Whether rats are more likely to get to shore from vessels at a dock of the river type than at a projecting pier is a point that has received little discussion. The old style dock, built against a bank of earth, certainly offers greater advantage to rats in the matter of harborage and greater chance of escape to the land in avoiding capture than does a long projecting pier.

Another factor that undoubtedly has had an influence in keeping plague out of Norfolk is the character of shipping that comes from foreign ports. Norfolk is preeminently a coal port. A large number of vessels from foreign ports call for bunker coal only; others take coal cargoes. These vessels load at modern steel coal piers that are built high in the air. The vessels load quickly and are away from the pier in a few hours. A considerable number of vessels from foreign ports bring cargoes of fertilizer materials, such as nitrates, kainite, etc., which is not a cargo that attracts rats. It, therefore, seems probable that the character of the shipping entering Norfolk from

foreign ports is a factor in lessening the probability of plague infection. With the further development of the port to handle other kinds of cargoes, the danger of plague importation will increase, and measures to meet this increased danger should be invoked.

These measures should begin with changes of building ordinances whereby ratproof construction would be required in the future, thereby eliminating rat harborages. This should be supplemented by the efforts of every occupant to keep his premises free from rats, bearing in mind that continuous vigilance, rather than spasmodic "rat drives," is necessary in keeping down the rat population.

## OTHER ECTOPARASITES ENCOUNTERED

While searching rats for fleas some other ectoparasites were encountered, the majority being mites or lice. Tables 4 and 5 show the number of such parasites collected by months and by zones.

TABLE 4.—*Distribution of other parasites by months*

| Parasites | 1927 | | | | | | | | | | 1928 | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | March | April | May | June | July | August | September | October | November | December | January | February | March | |
| *Lice* | | | | | | | | | | | | | | |
| Polyplax spinulosa (Burmeister) | 7 | 205 | 5 | 2 | 13 | 1 | 0 | 18 | 0 | 4 | 6 | 0 | 1 | 262 |
| *Mites* | | | | | | | | | | | | | | |
| Laelaps echidninus (Berlese) | ---- | 97 | 175 | 72 | 1,201 | 151 | 262 | 534 | 107 | 30 | 8 | 1 | 8 | 2,646 |
| Laelaps hawaiiensis (Ewing) | ---- | ---- | ---- | ---- | 4 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 4 |
| Liponyssus bacoti (Hirst) | ---- | 1 | 2 | 6 | 1 | 5 | ---- | 3 | 1 | ---- | ---- | 1 | ---- | 20 |
| Veigaia sp. | ---- | ---- | ---- | ---- | 1 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1 |
| Total mites | ---- | 98 | 177 | 78 | 1,207 | 156 | 262 | 537 | 108 | 30 | 8 | 2 | 8 | 2,671 |

TABLE 5.—*Distribution of other parasites by zones*

| Zone | Mites | | | | Lice |
|---|---|---|---|---|---|
| | Laelaps echidninus | Laelaps hawaiiensis | Liponyssus bacoti | Veigaia sp. | Polyplax spinulosa |
| 1 | 39 | ---- | ---- | ---- | 208 |
| 2 | 172 | ---- | 1 | ---- | 0 |
| 3 | 227 | ---- | 13 | ---- | 12 |
| 4 | 2,233 | 4 | 6 | 1 | 42 |
| Total | 2,671 | 4 | 20 | 1 | 262 |

Barring one rat that was heavily infested with *Polyplax spinulosa* (200 lice being estimated on this rat), the number of lice is negligible.

The large number of mites taken from rats in zone 4 is due to heavy infestation of the rats caught on one public dump. This dump was

located on the bank of one of the estuaries of the Elizabeth River, the refuse being used to fill marshy ground. The water level rose and fell with the tide. A total of 1,208 mites was obtained from 95 rats caught on this dump, and of this number, 1,083 were recovered from 36 rats trapped at this location in July, 1927. Only 12 fleas were found on these 95 rats.

## SUMMARY

(1) A rat-flea survey conducted in Norfolk, Va., from March 16, 1927, to March 31, 1928, resulted in the capture of 1,561 rats, from which 4,898 fleas were taken.

(2) Of this number of fleas, 3,999 (81.6 per cent) were *Xenopsylla cheopis;* 864 (17.7 per cent) were *Ceratophyllus fasciatus;* 28 (0.6 per cent) were *Ctenocephalus canis* (or *felis*); 6 were *Leptopsylla musculi;* and 1 was *Echidnophaga gallinacea.*

(3) On the basis of the above figures, the rat-flea index for the whole period is 3.14, and the *Xenopsylla cheopis* index is 2.56, the *Ceratophyllus fasciatus* index, 0.55.

(4) The *cheopis* index was found highest on the water front (not including docks), followed in order by the commercial district, residential district, and docks.

(5) *Rattus norvegicus* was practically the only species of rat encountered, all except four being of this species.

(6) The *cheopis* index was found to follow fairly closely the seasonal variation curve of relative humidity and temperature.

(7) The high *cheopis* index in the summer months seems to indicate a favorable opportunity for the implantation of plague infection, while the marked diminution of fleas during the colder months may be a factor in counterbalancing the danger of plague infection of the port.

## CONCLUSIONS

Upon the basis of the findings of the 12 months included in the period of this survey, it is evident that *Xenopsylla cheopis* is the predominant rat flea in Norfolk for eight months of the year.

The *Xenopsylla cheopis* index (2.56) of Norfolk seems sufficiently high to warrant the sanitary authorities in considering the port as probably infectible with plague, and the port should be diligently guarded against the introduction of plague, especially during the warmer months of the year (June 1 to December 1). It appears that conditions in the city are highly favorable for the perpetuation of the rat genus and that Norfolk has, at least, the average density of rat population that prevails in most cities of the Atlantic seaboard.

ACKNOWLEDGMENTS

It is desired to acknowledge indebtedness to Dr. Powhatan S. Schenck, Director of Public Welfare of Norfolk, for assistance rendered by his own department, and the assistance of other departments of the city government. The aid of the Norfolk station of the United States Weather Bureau in furnishing meteorological data, and of Dr. H. E. Ewing, Associate Entomologist, Department of Agriculture, who identified a number of parasites collected during the survey, is also gratefully acknowledged. It is also desired to make record of the author's appreciation of the cooperation and assistance rendered by the medical officer in charge of the New York Quarantine Station and his assistants in identifying parasites and recording the data pertaining to them.

REFERENCES

(1) Robertson, H. McG.: A possible explanation of the absence of bubonic plague in cold countries. Pub. Health Rep., vol. 38, July 6, 1923, pp. 1519–1531.

(2) Cragg, F. W.:

Geographical distribution of Indian rat fleas as a factor in the epidemiology of plague. Indian Jour. Med. Res., vol. 9, October, 1921, pp. 374–398.

Further records of distribution of Indian rat flea, with a note on the correlation between the prevalence of *Xenopsylla cheopis* and plague mortality. Indian Jour. of Med. Res., vol. 10, April, 1923, pp. 953–961.

(3) Hirst, L. F.:

Transmission of plague by fleas of genus *Xenopsylla*. Indian Jour. of Med. Res., vol. 10, January, 1923, pp. 789–820.

On the spread of plague in the East Indies, Tr. Roy. Soc. Trop. M. and Hygiene, vol. 17, No. 3, 1923–24, pp. 101–127.

(4) Grubbs, S. B.: Bubonic plague and maritime quarantine. Pub. Health Rep., vol. 42, August 12, 1927, pp. 2045–2056.

(5) Grubbs, S. B., Sierra, Lucas, and Suarez, Pablo A.: Report of committee on plague, Pan American Conference of Directors of Health. Pub. Health Rep., vol. 41, Nov. 12, 1926, p. 2592.

(6) Fox, Carroll, and Sullivan, E. C.: A comparative study of rat-flea data for several seaports of the United States. Pub. Health Rep., vol. 40, September 11, 1925, pp. 1909–1934.

(7) Cox, O. H., Carrion, Arturo L., and Fox, Carroll: Rat-flea survey of the port of San Juan, Porto Rico. A preliminary report. Pub. Health Rep., vol. 43, March 16, 1928, pp. 611–616.

## ENDEMIC TYPHUS FEVER OF THE SOUTHEASTERN UNITED STATES: REACTION OF THE GUINEA PIG[1]

By KENNETH F. MAXCY, *Passed Assistant Surgeon, United States Public Health Service*

The susceptibility of the guinea pig to typhus fever was established by the early researches of Charles Nicolle and his coworkers in Tunis (1912) and by Gaviño and Girard (1912) working in Mexico. Since

[1] From the Hygienic Laboratory, United States Public Health Service.

this discovery most of the laboratory research which has been done on this disease has been based upon this readily available species of experimental animal. Consequently the manifestations of typhus in the guinea pig have been very thoroughly, even minutely, studied and described. (Nicolle, 1920; Otto and Papamarku, 1920; Friedberger and Schiff, 1922; da Rocha-Lima, 1919; Wolbach, Todd, and Palfrey, 1922; Weil and Breinl, 1923; Doerr and Pick, 1918; Hach, 1925, and others.)

In previous papers (Maxcy and Havens, 1923, Maxcy, 1926 (*a*) (*b*), 1928) attention has been called to a disease which is prevalent in the southeastern United States which resembles typhus clinically and gives a positive Weil-Felix reaction, but which differs from typhus in its relative mildness and certain well-marked epidemiological characteristics. It seems to be established that the disease with which we are here concerned is endemic and is not louse borne. The question arises, then, whether the virus of this disease is identical with that of Old World typhus and with that of Mexican typhus (tabardillo), diseases which are known to be transmissible by lice.

The work of Anderson and Goldberger (1912) leaves little doubt as to the similarity of the reaction in monkeys inoculated with a strain of virus from a New York case of "Brill's disease" as compared with that of monkeys inoculated with Mexican typhus (tabardillo) and the cross protection afforded by one virus to the other in this experimental animal. Moreover the reaction of the guinea pig to this strain of Brill's disease, as reported by Anderson (1914), corresponded to that of Old World typhus.

In spite of this evidence for the identity of the two diseases, it was thought possible that minor differences might exist which would serve to distinguish them. Moreover, it seemed expedient to work with strains which were derived from cases occurring in the cities of the southeastern United States where there is less chance of the direct importation of the infection from abroad.

While this work was in progress the very interesting reports of Mooser (1928) appeared which, taken together with the brief note of Neill in the Public Health Reports of 1918, indicated that guinea pigs inoculated with Mexican typhus present differences from those inoculated with Old World typhus. It was accordingly desirable to know with which of these the endemic typhus virus of the southeastern United States could be identified.

This report is a brief review of the information which has been obtained up to the present regarding the behavior of the virus of the endemic typhus (Brill's disease) of the United States in guinea pigs and a comparison with the known manifestations of the virus of Old World typhus and of Mexican typhus (tabardillo) in this species of experimental animal.

During the past five years repeated attempts have been made to establish a strain from human cases of this endemic typhus in Alabama, Georgia, North Carolina, and Virginia.[1] Many of these attempts were unsuccessful. In a few the result was apparently positive; but on account of failure, for one reason or another, to propagate the strain, the studies were not sufficiently complete to warrant publication. These experiences were none the less valuable in judging of the validity of the observations which have since been made. The material here presented has been derived from two strains which have been carried through a long series of passages and carefully studied.

## ORIGIN OF ENDEMIC STRAINS

*Strain "H"* was obtained at Savannah, Ga., in 1926, with the collaboration of Mr. Conrad Kinyoun, city bacteriologist, through the courtesy of the attending physician, Dr. Lawrence Lee.[2] The patient (W. C. H.) had a typical and rather severe case of endemic typhus fever of two weeks' duration with a well-marked eruption, considerable prostration, and a rather protracted convalescence. Serum obtained on the fifteenth day after onset agglutinated Proteus $X_{19}$ in a dilution of 1:320.

Six cubic centimeters of defibrinated blood obtained from this patient on the seventh day of his illness were injected intraperitoneally into a *Macacus rhesus*. This monkey reacted with fever after an incubation period of 10 days. By subsequent passages through two generations of monkeys [3] the strain of virus was established in guinea pigs. In guinea pigs the strain was maintained by passage through 25 generations, involving 219 animals.

*Strain "Wil"* was obtained at Wilmington, N. C., in 1928, with the collaboration of Dr. John H. Hamilton and Dr. David Murchison, through the courtesy of the attending physician, Doctor Bellamy. The patient (Mr. "B") had a typical clinical, though rather mild, attack of endemic typhus fever. His fever lasted about two weeks and the eruption was well developed. Serum obtained on the seventh day agglutinated Proteus $X_{19}$ up to a dilution of 1:160; a later observation could not be obtained.

Two to four cubic centimeters of defibrinated blood obtained from this patient on the seventh day of his illness were injected intraperitoneally into each of three guinea pigs. Guinea pig No. 1 showed

---

[1] The author desires to express his deep appreciation to associates and to physicians for their interest and assistance in these studies, particularly to Dr. L. C. Havens, director of the Alabama State Laboratories, Mr. Conrad Kinyoun, director of the Savannah Municipal Laboratory, Dr. John H. Hamilton, county health officer, and Dr. David Murchison, of Wilmington, N. C., and Dr. Foard McGinnes, director of the Virginia State Laboratories.

[2] Doctor Lee was the first physician to recognize the clinical syndrome of endemic typhus in Savannah and reported a case to the Georgia Medical Society in 1915.

[3] The reactions of these monkeys will be described in a subsequent paper.

a slight elevation of temperature on the tenth day, and No. 4 on the eighth day, but transfers from both remained normal throughout the period of observation subsequent to inoculation. On the other hand, guinea pig No. 3 showed a marked elevation of temperature on the eleventh day, and from this animal a strain was established which has been maintained since that time. Over 200 guinea pigs have been inoculated with this virus up to the present time.

## CONTROL STRAINS

During the time that the "H," or Savannah, strain was being studied, there was available in the laboratory for comparison, strain "W" of Old World typhus, which was brought from Poland by Dr. S. W. Wolbach [4] in 1921.

In the summer of 1928 the author obtained from Dr. F. Brienl, in Prague, a transfer from a strain of Old World typhus, and transported it successfully to the United States. This strain, called "B," is still being continued in guinea pigs at the Hygienic Laboratory after passage through some 200 animals.

Through the kindness of Dr. W. B. Wherry, a transfer of the strain "Mm" of "tabardillo," which was obtained from a case in Mexico City by Dr. H. Mooser, was received, and this, too, has been passed through some 20 generations involving about 100 animals.

Opportunity has therefore been had to study two strains of Old World typhus and one strain of Mexican typhus during the period that observations were made on the endemic strains of virus which are the subject of this report. As the reaction of the guinea pig to Old World typhus has already been fully described by many authors, and as Mooser (1928) has recently given a full description of Mexican typhus in guinea pigs, it is unnecessary here to detail the behavior of these strains. It suffices to say that they conformed satisfactorily to the descriptions available in the literature.

## TECHNIQUE

The guinea-pig stock was purchased from dealers and placed under observation for from one to six months before use. Sound male animals were selected and isolated in small groups. Temperatures were taken each morning at about the same time. So far as possible, only those animals were used which showed a normal temperature range for at least two weeks preceding inoculation. In this way attempt was made to eliminate poor stock and natural guinea-pig infections.

A temperature in excess of 39.6° C. was looked upon as abnormal, but allowance was made for the transitory elevations of temperature

[4] This strain was observed for more than one year, about 400 guinea pigs having been inoculated with it.

to which guinea pigs are subject. By the use of large numbers of guinea pigs and repetition of experiments, effort has been made to avoid the errors arising from interpretation of temperature curves.

Animals were selected for transfer which had shown a satisfactory temperature curve throughout the period of incubation. They were etherized and bled from the heart. The heart blood was routinely cultured in broth for contaminations or secondary invaders. An inspection of the organs was then made for evidence of natural guinea-pig disease or of secondary contamination. Blood, brain emulsion, and testicular washings were used as a source of virus, and the inoculations were made intraperitoneally unless otherwise specified.

Blood was used in dosage of 1 to 5 c. c. Brain emulsion was prepared by grinding in a mortar the whole brain, or sometimes only one cortical hemisphere, adding gradually about 20 c. c. of normal salt solution. The average weight of a guinea-pig brain is about 3 grams; 2 c. c. of the emulsion of whole brain would therefore weigh about 0.3 gram. When only one hemisphere was utilized, the weight was figured as approximately one-third of the whole brain emulsion. The dosage of brain emulsion as expressed is only roughly approximate and relative, since the amount of virus in each brain varies widely with the individual guinea pig and with the time in the course of the infection, as has been shown by Weil and Breinl (1923).

Testicular washings were prepared by removing one testicle from the scrotal sac, without the parietal lamina of the tunica, through the peritoneal cavity and suspending it in 10 to 20 c. c. of normal salt solution. The testicle was gently agitated, but not crushed, in the solution for a few minutes. Dilutions of the resulting suspension were then made.

### MANIFESTATIONS OF THE ENDEMIC STRAIN OF VIRUS

*Incubation period.*—The temperature charts of guinea pigs which had developed a definite, uncomplicated febrile reaction following inoculation with blood or brain virus were analyzed. The average length of the period of incubation for 50 guinea pigs inoculated with the "H" strain was 6.9 days; for 50 inoculated with the "Wil" strain, 7.7 days. The shortest period was four days, occurring only three times in the "H" strain and twice in the "Wil" series. The longest was 14 days.

*Fever.*—The onset of the fever was abrupt, and the temperature frequently reached its highest level during the first 24 hours. The further course was irregular. The fever sometimes subsided in a day or two; more often it continued for about a week. The average duration, based upon 36 charts of the "H" strain, was 7.1; in an equal number of injections with the "Wil" strain it was 6.2. So far, no instance has been encountered in which the fever lasted more than 14 days.

The characteristics of the temperature curve are brought out in the accompanying graphs of guinea pigs inoculated with the "H" strain (fig. 1) and with the "Wil" strain (fig. 2) of endemic typhus.

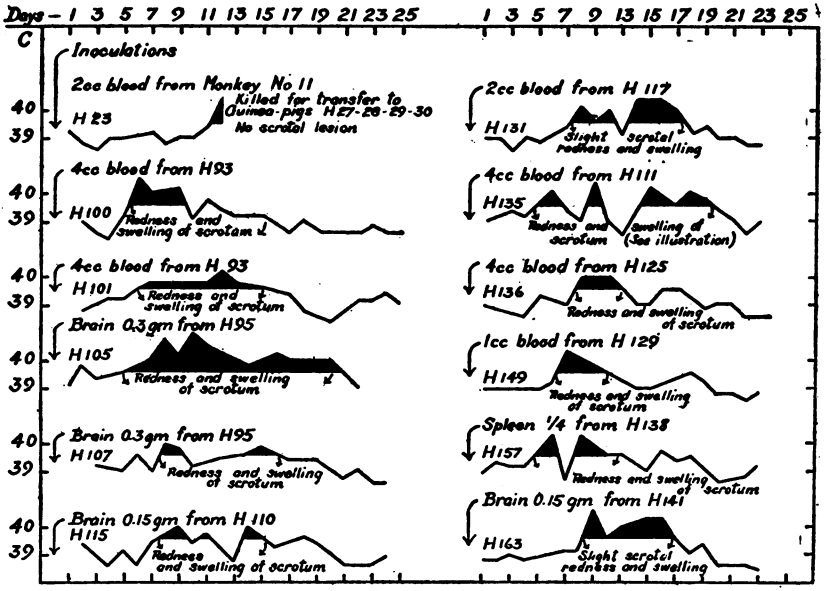



FIG. 1.—Temperature curves of guinea pigs inoculated with the "H" strain of endemic typhus virus from Savannah, Ga.

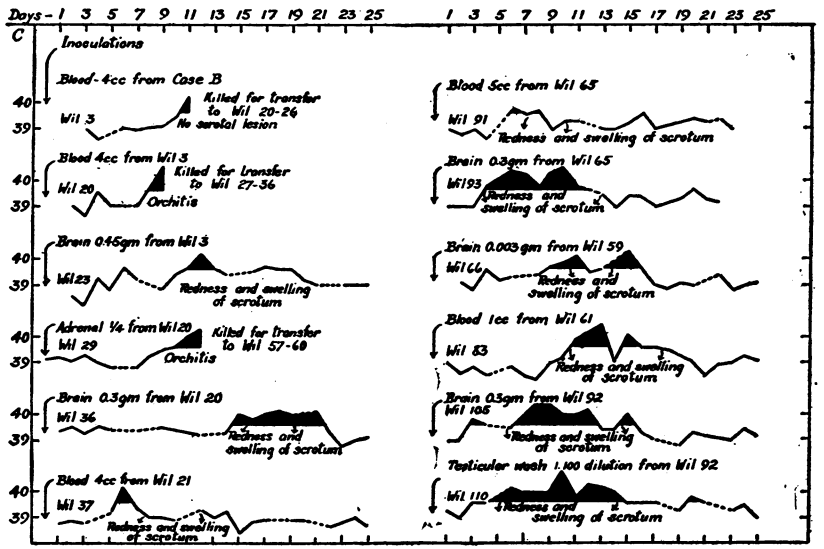



FIG. 2.—Temperature curves of guinea pigs inoculated with the "Wil" strain of endemic typhus virus from Wilmington, N. C.

For comparison, there are shown in Figure 3 a few temperature curves of guinea pigs inoculated with Mexican typhus and with Old World typhus. In general, it seems that the temperature curve of

endemic typhus conforms with that of the former rather than the latter, though the distinction is by no means a sharp one.

*Constitutional reaction.*—During the course of the fever the guinea pigs did not appear to be particularly ill. Their hair did not ruffle up as it does with so many infections. Their appetite and activity were reduced but slightly, if at all.

Some loss of weight was apparent when the fever was of several days' duration. The average gain of five guinea pigs in a period of three weeks preceding inoculation was 38 grams. During the 17 days following inoculation, during which they showed a well-marked febrile reaction, they lost an average of 60 grams. During nine days thereafter they had regained an average of 25 grams apiece.

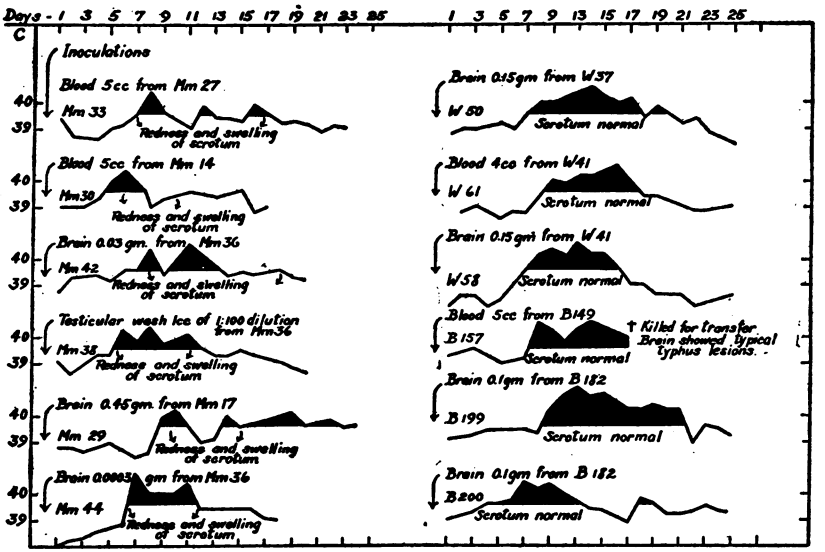



FIG. 3.—Temperature curves of guinea pigs inoculated with a Mexican (left) and an Old World (right) strain of typhus virus

The virus unaided did not appear to kill; deaths were rare, and when they occurred were generally to be accounted for by the presence of some latent natural disease, secondary invader, or contamination. Cultures of the heart blood in glucose broth in Smith tubes at the time of transfer were sterile except as contaminants or secondary invaders were occasionally encountered.

*Presence of the virus in other tissues.*—Besides blood, brain, and tunica vaginalis, virus was demonstrated in various organs—liver, spleen, kidney, and adrenal—of exsanguinated animals.

*Immunity to reinoculation.*—Animals which had recovered from an attack were immune to subsequent inoculation with a later generation of the same virus. This immunity lasts for at least a month or two. The limit of its duration has not been determined.

*Involvement of the scrotum and testis.*—The most striking manifestation of the endemic virus was uniform involvement of the scrotum of the type described by Neil in 1918 in Mexican typhus and more recently by Mooser (1928). It was obvious on casual inspection in more than 90 per cent of the male animals inoculated. Its presence was a more certain indication of successful infection than the temperature curve.

About the time of the onset of fever, perhaps a day or two before, or one or two days after, involvement of the scrotum became apparent. The redness was first seen over the proximal part and extended distally. Frequently it began on one side and later spread to the other. The involvement progressed until, on the second or third day, the scrotum became markedly swollen and tense; the skin over it was shiny and red. The redness was sometimes diffuse, sometimes blotchy. At this stage the testicles could not be readily replaced within the peritoneal cavity. As the swelling gradually subsided, the testes remained fixed in the scrotal sac and underwent apparent diminution in size; the redness disappeared, and the skin became wrinkled and finally returned to normal. The process never went on to a superficial necrosis, such as is seen in Rocky Mountain spotted fever.

*Pathology.*—Macroscopic post-mortem examination of animals killed during the course of the infection was uniformly negative, except with regard to the spleen and scrotal sac.

The spleen was usually normal in appearance during the early stages. If the fever was of long duration and the animal had been killed late, the spleen was often slightly enlarged and the Malpighian bodies were prominent. Rarely there was a thin fibrinous exudate which could be readily stripped off.

When the guinea pig was killed during the first 24 to 48 hours after onset of fever and the scrotal sac opened, the testes appeared swollen and the blood vessels supplying them engorged. On the second or third day a thin layer of exudate was evident. This tended to glue together the parietal and visceral tunica, forming easily broken adhesions. There were usually found at this time hemorrhages into the cremasteric fascia just external to the parietal lamina of the tunica vaginalis and beneath the visceral lamina over the testis especially near the upper pole at its juncture with the fat body. When the involvement was marked, the processus vaginalis became obliterated by adhesions and the tunica thickened. The testes diminished in size and became atrophic.

This process has been studied histologically by Dr. R. D. Lillie and will be reported subsequently.

When smears were made from the surface of the parietal and visceral tunica during the early stages of its involvement—that is,

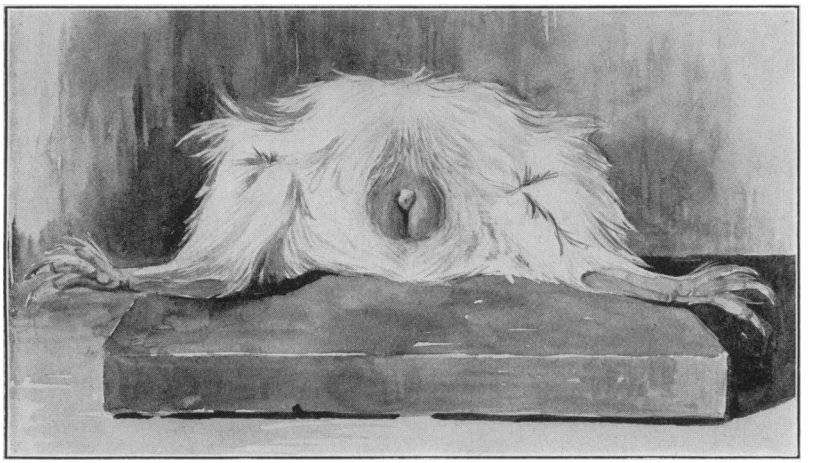


Figure 4.—Appearance of scrotum of normal guinea pig

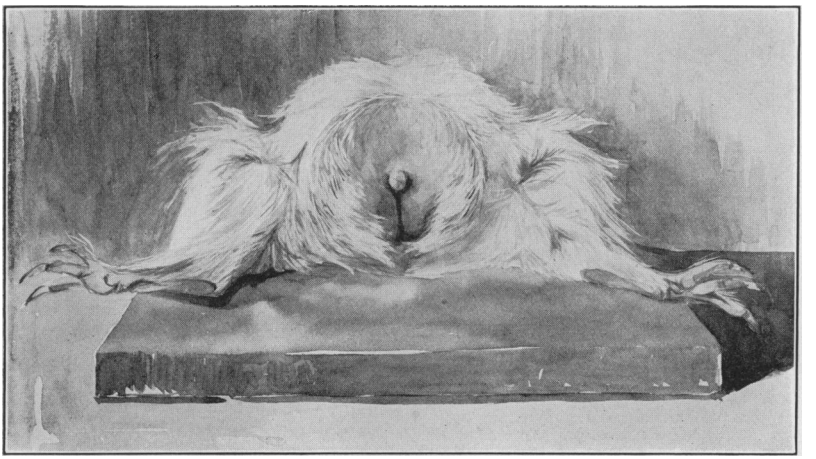


Figure 5.—Swelling of the scrotum of a guinea pig seven days after inoculation with the "H" strain of endemic typhus from Savannah, Ga. The skin over scrotum is shiny and red. This lesion is characteristic of the endemic strains and of Mexican typhus

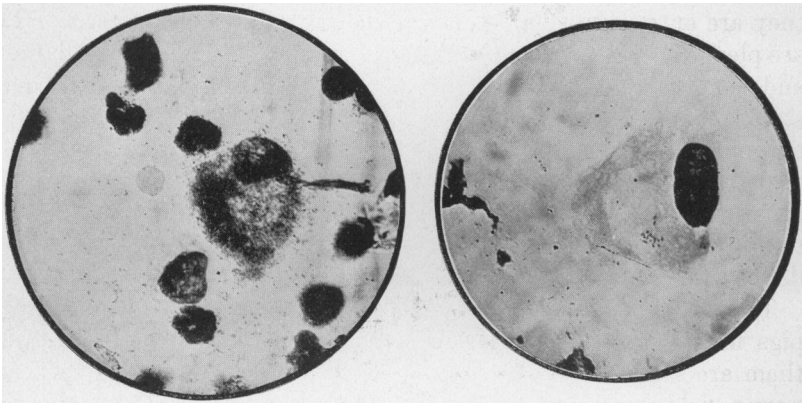


Figure 6.—Cells containing rickettsialike organisms, seen in smears from the tunica of guinea pigs "Wil 132" (left) and "Wil 160" (right) infected with endemic typhus. (Zeiss 3 mm., 1.4 N. A. apochrom. immers. × Homal III, 1,200 diameters)

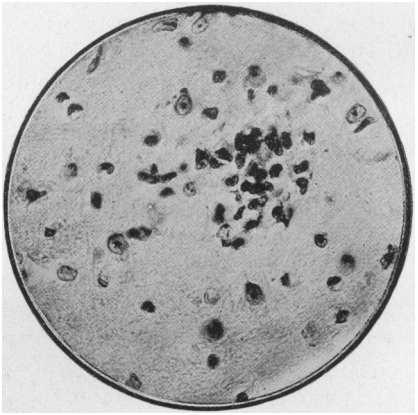


Figure 7.—Typhus node from the brain of guinea pig "Wil 125," endemic strain, killed 15 days after inoculation, on eleventh day of fever. (Zeiss 4 mm., 8.95 N. A. apochrom. × Homal III, 600 diameters)

within 24 to 48 hours after the redness and swelling had appeared—the minute intra-cellular organisms which have been described by Mooser (1928, *b*) were found. The morphology of these organisms is shown in the accompanying illustrations. It will be noted that they are extremely small as compared with common bacteria. They are pleomorphic rods, frequently so short as to be coccoid in character, and tend to appear in pairs, end to end as diplobacilli. With Giemsa stain they take a purple tinge against the faint blue color of the cytoplasm of the cell. The contour of the bacterial body is less sharply defined than is usual with ordinary bacteria. It seems to consist of two substances, one of which stains faintly, the other taking a deep stain, giving the appearance at times of a poorly defined polar body. They are Gram negative.

These organisms are constantly present in the tunica cells of guinea pigs infected with the endemic strain of typhus. Cells containing them are sometimes so numerous as to appear in almost every high-power field, occasionally several infected cells in the same field. More frequently it is necessary to search for a few minutes before such a cell is found. The organisms appear only in the epithelial type of cell which lines the tunica; they are not found in the leucocytes or lymphocytes, which are present in large numbers in the exudate. Cells which have been invaded become packed, and then tend to rupture when the smear is made, so that many organisms become strewn about near by. Cultures of material containing these cells made on ordinary laboratory media remain sterile.

It is not intended to discuss the significance of these organisms in relation to the etiology of the disease at this time. Morphologically they appear to be similar to the organisms which were described by Ricketts as present in the blood of patients with Mexican typhus and which were later identified by da Rocha Lima, Wolbach, and others with the organisms which they observed in the epithelial cells of the stomach of lice which had fed upon typhus patients and which are now called "rickettsiae."

*Histological preparations of the brain.*—Sections have been made from the brains of a large number of guinea pigs infected with the endemic strain, with the Mexican strain, and with the Old World strains, and examined by Dr. R. D. Lillie.[5] It suffices to state that nodes of the type described as characteristic of Old World typhus have been found rarely and with difficulty in brains from guinea pigs infected with the endemic strain and the Mexican strain. They are easily demonstrated in the guinea pigs inoculated with Old World virus in the same manner and with similar dosage.

[5] The details of this study will appear in a subsequent report.

## DISCUSSION AND SUMMARY

Blood from persons sick with the "endemic typhus" of southeastern United States injected into guinea pigs produces a definite febrile illness, with recovery and subsequent immunity to reinoculation. The reaction of the guinea pig appears to be identical with that produced by Mexican typhus, according to Mooser's description. It differs from that of the Old World typhus (1) in regard to the character of the fever curve, (2) in the relative rarity of the so-called typhus nodes in the histological preparation of the brain, and (3) in the presence of an obvious and well-defined scrotal lesion first described by Neill in 1918 in Mexican typhus.

So far as the differences in the temperature curve and in the relative frequency of occurrence of typhus nodes are concerned, these might be explained as due to strain variation. In a study of 13 strains obtained from cases in the same general locality in Poland, Hach (1925, *b*) found one strain in which, in spite of a very outspoken febrile reaction, the brain lesions were extremely hard to find. In another the temperature elevations were relatively slight, although the period of incubation and duration of the fever were essentially the same as in other strains.

On the other hand, the involvement of the scrotum is much more striking and extensive than has been observed or described in guinea pigs inoculated with Old World typhus. When this obvious involvement was first encountered in a strain obtained from a case in Montgomery, Ala., in 1925, it was thought possible that it might be due to a secondary or contaminating infection. Since that time the same finding has been present in three other strains which have been successively established from cases in Montgomery, Ala., Savannah, Ga., and Wilmington, N. C. It was observed by Dr. William Allan in a strain from a case in Charlotte, N. C. (personal communication). It has been constantly associated with the presence of the virus and not with other infections in guinea pigs. It has not been observed during the past two years in guinea pigs from the same stock which have been inoculated with two strains of Old World typhus, though much less extensive histological changes of a similar nature occur.

These findings have been so consistent that it seems to be established that the obvious involvement of the scrotum and the rarity of brain lesions are characteristic of the endemic typhus virus in guinea pigs as they are of Mexican virus. The demonstration of rickettsia-like organisms in the epithelial cells of the tunica brings additional evidence as to their identity.[6] It appears, therefore, that a North

[6] More recently, Dr. Henry Pinkerton, of the department of pathology, Harvard University (personal communication), has succeeded in demonstrating these minute intracellular organisms in the scrotal sac of guinea pigs infected with European typhus, even though the reaction be scarcely visible macroscopically.

American strain of typhus can be recognized and distinguished from Old World typhus, though the two be closely related immunologically.

The conclusion may be drawn that the disease which is endemic in our eastern seaports, Wilmington, N. C., Charleston, S. C., Savannah, Ga., Jacksonville, Fla., belongs to the typhus group, but is not dependent upon importation from across the sea. This disease has a common origin with the typhus of Mexico, even though transmission be effected by some agent other than that generally recognized for this disease, namely the louse.

## REFERENCES


Anderson, John F. (1914): The reaction of the guinea pig to the virus of typhus fever. J. Med. Res., vol. 30, pp. 467–473.

Anderson, John F., and Goldberger, Joseph (1912): Collected studies on typhus. Hyg. Lab. Bull. 86, U. S. Pub. Health Serv.

Doerr, R., and Pick, R. (1918): Experimentelle Untersuchungen über Infektion und Immunität bei Fleckfieber. Wien. klin. Wochenschr., vol. 31, pp. 829–834.

Friedberger, E., and Schiff, F. (1922): Weitere Beiträge zur experimentellen Fleckfieberinfektion des Meer schweinchens. Ztschr. f. Immunitätsforsch. u. Exp. Therap., Jena. 1. Teil, Orig., vol. 35, pp. 268–292.

Gaviño, A., and Girard, J. (1912): Estudio experimental sobre el tifo exantematico (Universidad Nacional de Mexico, 1911). Abstr. Centralbl. f. Bakteriol., etc., Jena, Abt. 1, Ref., vol. 53, pp. 342–344.

Hach, I. W.:

(*a*) (1925): Beiträge zur experimentellen Pathologie des Fleckfiebers. 1. Über den Fieberanfall bei Fleckfiebermeerschweinchen. Ztschr. f. Hyg. u. Infektionskrankh., vol. 104, pp. 319–336.

(*b*) (1928): 3. Zur Frage der Veränderlichkeit des Fleckfiebervirus Ztschr. f. Hyg. w. Infektionskrankh., vol. 104, pp. 337–346.

Maxcy, Kenneth F.:

(*a*) (1926): Clinical observations on endemic typhus (Brill's disease) in southern United States. Pub. Health Rep., vol. 41, No. 25, pp. 1213–1220.

(*b*) (1926): An epidemiological study of endemic typhus (Brill's disease) in the southeastern United States, with special reference to its mode of transmission. Pub. Health Rep., vol. 41, No. 52, pp. 2967–2995.

(1928): The distribution of endemic typhus (Brill's disease) in the United States. Pub. Health Rep., vol. 43, No. 47, pp. 3084–3095.

Maxcy, Kenneth F., and Havens, Leon C. (1923): A series of cases giving a positive Weil-Felix reaction. Am. J. Trop. Med., vol. 3, pp. 495–507.

Mooser, Herman (1928): Reaction of guinea pigs to Mexican typhus (Tabardillo). Preliminary note on bacteriologic observations. J. Am. Med. Assoc., vol. 91, pp. 19–20.

Mooser, H.:

(*a*) (1928): Ein Beitrag zur Ätiologie des Mexikanischen Fleckfiebers. Arch. f. Schiffs- u. Tropen-Hyg., vol. 32, pp. 261–264.

(*b*) (1928): Experiments relating to the pathology and the etiology of Mexican typhus (Tabardillo). 2. Diplobacillus from the proliferated tunica vaginalis of guinea pigs reacting to Mexican typhus. J. Inf. Dis., vol. 43, pp. 261–272.

Nicolle, Charles (1920): État de nos connaissances expérimentales sur le typhus exanthématique. Bull. de l'Inst. Pasteur, Paris, vol. 18, pp. 1–12.
Nicolle, Charles, Conseil, E., and Conor, A. (1912): Recherches expérimentales sur le typhus exanthématique entreprises à l'Institute Pasteur de Tunis pendant l'année 1911. Ann. de l'Institut Pasteur, Paris, vol. 26, pp. 250–280; 332–350.
Neill, M. H. (1917): Experimental typhus fever in guinea pigs. A description of a scrotal lesion in guinea pigs infected with Mexican typhus. Pub. Health Rep., vol. 32, No. 27, pp. 1105–1108.
Otto, R., and Papamarku, P. (1920): Weitere Beiträge zur experimentellen Fleckfieberinfektion des Meerschweinchens. Centralbl. f. Bakteriol., etc., Jena Abt. 1, Orig., vol. 84, pp. 12–19.
da Rocha-Lima, H. (1919): Ueber die Ätiologie des Fleckfiebers. Berlin Klinik, vol. 29, No. 325, pp. 1–26.
Weil, E., and Breinl, F. (1923): Experimental studies on infection and immunity in typhus. J. Infect. Dis., vol. 33, pp. 60–74.
Wolbach, S. B., Todd, J. L., and Palfrey, F. W. (1922): The etiology and pathology of typhus. Harvard Univ. Pr., Cambridge, Mass. 222 pp.

## COURT DECISIONS RELATING TO PUBLIC HEALTH

*Act requiring washhouses at certain coal mines held constitutional.*—(Tennessee Supreme Court; Sun Coal Co. *v.* State, 11 S. W. (2d) 893; decided December 8, 1928.) Chapter 24, Laws 1921, required that washhouses be provided at coal mines employing 50 or more persons. The appellant company, having been found guilty of a misdemeanor for failure to comply with the statute, attacked the constitutionality of same. It contended that the act was partial in its application, creating a class not founded upon any reasonable basis for classification, and arbitrary. With these views the supreme court did not agree, holding that the statute in question was constitutional and valid. The court said in part:

* * * It is contended that the legislature was without power to make the requirement of operators of coal mines, while not including in its application operators of other kinds of mines, foundries, and manufacturing plants. It is urged also that the classification is arbitrary, in that the statute is not made to apply to coal mines in which less than 50 employees are engaged.

The statute is clearly an exercise by the legislature of its police power. * * *

The extent of the industry, the number of employees engaged in coal mining, the financial ability of the industry to comply with the regulation, the conditions under which such employees are required to work, the general state of health of coal miners, the percentage of mortality among coal miners, the effect of coal dust upon the health of the miners, are all circumstances which may well be conceived as influencing the legislature in the enactment of the statute. If, upon consideration of these and other aspects of the industry, the legislature determined that the regulation was necessary to the preservation of the health of coal miners, the courts of the state are without power to review the exercise of legislative discretion and to say that the regulation was neither necessary nor desirable in the interest of the public welfare. Certainly we could not say as a matter of judicial knowledge that the same conditions which impelled the legislature to

enact the statute exist in equal degree in other mining or manufacturing enterprises.

* * * * * * *

Legislation designed to protect the health of coal miners can not be said to be founded upon an arbitrary classification, because it is not extended to other industries, in which the legislature may have found that working conditions were dissimilar.

Nor can we say that the failure to make the statute applicable to mines in which less than 50 employees are engaged is an arbitrary or unreasonable classification.

As pointed out in the brief of the learned assistant attorney general, even though the health of the employees in a smaller mine should be accorded the same protection, the expense of compliance with the statute may have been regarded by the legislature as too great a burden to be required of the smaller mine, and this consideration would furnish a reasonable basis for the classification. * * *

If the cost of compliance with the statute will increase the cost of mining coal in the larger mines, so as to put them at a disadvantage in competition with smaller mines not included in the statute, the hardship is one which the legislature must be deemed to have weighed in their consideration of the policy involved. It is not an argument against the validity of the statute or the power of the legislature to enact it. * * * The possible discrimination against the larger mines required to comply with the statute is an indirect effect of the statute, which can not affect the reasonableness of the classification made for the protection of the health of mine employees.

*Keeping of swine and dumping or leaving garbage in town restrained.*—(Massachusetts Supreme Judicial Court; Inhabitants of Swansea *v.* Pivo, 164 N. E. 390; decided January 5, 1929.) The board of health of the town of Swansea adopted the following regulations:

No person, firm or corporation shall keep or maintain within the limits of the town six or more swine over 3 months of age without a permit from the board of health.

No person, firm or corporation shall deposit, dump or leave within the limits of the town any swill or garbage without a permit from the board of health and in such case in no place other than that fixed by the board and described in such permit. * * *

Thereafter the defendant kept a large number of swine in the town without a permit from the board of health and in violation of the regulations. The board of health, acting under statutory authority, then directed the issuance of an order of prohibition against the defendant, having already determined that the keeping of swine and the dumping or leaving of garbage by the defendant was dangerous to the public health and a nuisance. The defendant failed to obey the order and suit was brought by the town to restrain him. A decree, entered in favor of the town, was affirmed by the supreme court. Points determined by the appellate court are set forth in the quotations from the opinion which follow:

The [master's] report discloses, it was admitted by the plaintiff, that the records of the meeting held on July 8, 1927, when the regulations were adopted,

and the records of the meeting of November 21, 1927, when the order of prohibition was voted, were amended by the clerk of the board of health the latter part of November or the first part of December, 1927, and that the amended records were signed by the clerk of the board. The master further found that "the amended records, * * * in evidence, are a true record of what took place at the meetings named." The records as amended plainly show that the regulations and order of prohibition were duly adopted. The clerk had power to amend his original records to conform to the truth. The amendments thus made became a part of the record and the whole record is to be considered as such. * * *

The town may maintain a suit in equity to enforce regulations adopted by its board of health, under the provisions of G. L. c. 111, sections 31, 122, 143; * * * As the original records were inaccurate and defective, it was within the power and was the duty of the clerk to amend them. It could be shown by a member of the board that the amended records were accurate. * * *

The defendant made an offer to prove that the board of health acted in bad faith in issuing the order of prohibition, and offered to show that the acts complained of did not constitute a nuisance and were not injurious to health. This evidence was rightly excluded. The proffered proof was not admissible in these proceedings. * * *

"The determination of the board of health is not a merely ministerial act; but is quasi judicial, in the sense that it is not to be contested or revised, except in the manner provided in the statute. * * *"

* * * It does not appear that any special authorization to continue the trade or employment pending this suit was given under G. L. c. 111, sec. 148.

---

## DEATHS DURING WEEK ENDED MARCH 2, 1929

*Summary of information received by telegraph from industrial insurance companies for the week ended March 2, 1929, and corresponding week of 1928. (From the Weekly Health Index, March 7, 1929, issued by the Bureau of the Census, Department of Commerce)*

| | Week ended Mar. 2, 1929 | Corresponding week, 1928 |
|---|---|---|
| Policies in force | 73, 396, 493 | 70, 380, 930 |
| Number of death claims | 19, 215 | 15, 679 |
| Death claims per 1,000 policies in force, annual rate | 13. 7 | 11. 6 |

*Deaths from all causes in certain large cities of the United States during the week ended March 2, 1929, infant mortality, annual death rate, and comparison with corresponding week of 1928. (From the Weekly Health Index, March 7, 1929, issued by the Bureau of the Census, Department of Commerce)*

| City | Week ended Mar. 2, 1929 | | Annual death rate per 1,000 corresponding week, 1928 | Deaths under 1 year | | Infant mortality rate week ended Mar. 2, 1929 [2] |
|---|---|---|---|---|---|---|
| | Total deaths | Death rate [1] | | Week ended Mar. 2, 1929 | Corresponding week, 1928 | |
| Total (65 cities) | 8,994 | 15.8 | 14.5 | 956 | 872 | [3] 82 |
| Akron | 47 | | | 7 | 8 | 72 |
| Albany [4] | 41 | 17.8 | 15.2 | 2 | 2 | 40 |
| Atlanta | 93 | 19.1 | 19.3 | 6 | 10 | 62 |
| White | 52 | | | 1 | 6 | |
| Colored | 41 | [5] | [5] | 5 | 4 | |
| Baltimore [4] | 280 | 17.6 | 17.2 | 27 | 21 | 87 |
| White | 197 | | | 17 | 19 | 68 |
| Colored | 83 | [5] | [5] | 10 | 2 | 158 |
| Birmingham | 87 | 20.5 | 18.3 | 16 | 13 | 145 |
| White | 40 | | | 3 | 6 | 45 |
| Colored | 47 | [5] | [5] | 13 | 7 | 298 |
| Boston | 298 | 19.5 | 17.0 | 36 | 35 | 100 |
| Bridgeport | 38 | | | 3 | 6 | 52 |
| Buffalo | 154 | 14.5 | 15.6 | 17 | 18 | 73 |
| Cambridge | 32 | 13.3 | 12.9 | 2 | 4 | 36 |
| Camden | 50 | 19.3 | 13.1 | 4 | 4 | 69 |
| Canton | 33 | 14.8 | 10.3 | 3 | 2 | 71 |
| Chicago [4] | 878 | 14.5 | 13.7 | 99 | 84 | 88 |
| Cincinnati | 151 | | | 18 | 21 | 105 |
| Cleveland | 246 | 12.7 | 10.9 | 36 | 28 | 106 |
| Columbus | 99 | 17.3 | 15.0 | 7 | 7 | 66 |
| Dallas | 69 | 16.6 | 13.4 | 9 | 8 | |
| White | 55 | | | 8 | 6 | |
| Colored | 14 | [5] | [5] | 1 | 2 | |
| Dayton | 53 | 15.0 | 12.2 | 6 | 3 | 95 |
| Denver | 110 | 19.5 | 16.5 | 18 | 10 | 174 |
| Des Moines | 31 | 10.7 | 12.7 | 3 | 1 | 54 |
| Detroit | 357 | 13.5 | 12.1 | 45 | 54 | 72 |
| Duluth | 30 | 13.4 | 8.5 | 0 | 2 | 0 |
| El Paso | 33 | 14.6 | 21.3 | 10 | 7 | |
| Erie | 18 | | | 2 | 3 | 41 |
| Fall River [4] | 31 | 12.1 | 12.5 | 6 | 4 | 113 |
| Flint | 26 | 9.1 | 11.9 | 9 | 5 | 109 |
| Fort Worth | 35 | 10.7 | 11.3 | 6 | 2 | |
| White | 27 | | | 4 | 1 | |
| Colored | 8 | [5] | [5] | 2 | 1 | |
| Grand Rapids | 37 | 11.8 | 12.4 | 4 | 3 | 60 |
| Houston | 66 | | | 6 | 5 | |
| White | 47 | | | 4 | 4 | |
| Colored | 19 | [5] | [5] | 2 | 1 | |
| Indianapolis | 129 | 17.7 | 14.4 | 10 | 7 | 80 |
| White | 109 | | | 9 | 3 | 83 |
| Colored | 20 | [5] | [5] | 1 | 4 | 60 |
| Jersey City | 82 | 13.2 | 12.9 | 9 | 10 | 70 |
| Kansas City, Kans | 36 | 15.9 | 12.8 | 3 | 1 | 66 |
| White | 28 | | | 2 | 0 | 50 |
| Colored | 8 | [5] | [5] | 1 | 1 | 179 |
| Kansas City, Mo | 145 | 19.4 | 15.4 | 17 | 12 | 143 |
| Knoxville | 30 | 14.9 | 15.9 | 0 | 4 | 0 |
| White | 16 | | | 0 | 3 | 0 |
| Colored | 14 | [5] | [5] | 0 | 1 | 0 |
| Los Angeles | 352 | | | 26 | 21 | 76 |
| Louisville | 126 | 20.0 | 14.9 | 10 | 8 | 81 |
| White | 107 | | | 10 | 4 | 93 |
| Colored | 19 | [5] | [5] | 0 | 4 | 0 |
| Lowell | 46 | | | 5 | 1 | 113 |
| Lynn | 31 | 15.4 | 12.9 | 1 | 1 | 27 |

[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 71 cities.
[4] Deaths for week ended Friday.
[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; Houston, 25; 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 March 2, 1929, infant mortality, annual death rate, and comparison with corresponding week of 1928. (From the Weekly Health Index, March 7, 1929, issued by the Bureau of the Census, Department of Commerce)*—Continued

| City | Week ended Mar. 2, 1929 | | Annual death rate per 1,000 corresponding week, 1928 | Deaths under 1 year | | Infant mortality rate week ended Mar. 2, 1929 |
|---|---|---|---|---|---|---|
| | Total deaths | Death rate | | Week ended Mar. 2, 1929 | Corresponding week, 1928 | |
| Memphis | 94 | 25.8 | 18.7 | 11 | 4 | 130 |
| White | 52 | | | 5 | 2 | 95 |
| Colored | 42 | (2) | (2) | 6 | 2 | 188 |
| Milwaukee | 132 | 12.7 | 9.9 | 21 | 20 | 92 |
| Minneapolis | 97 | 11.1 | 10.1 | 10 | 8 | 62 |
| Nashville | 86 | 32.2 | 20.6 | 9 | 6 | 145 |
| White | 61 | | | 6 | 3 | 130 |
| Colored | 25 | (2) | (2) | 3 | 3 | 189 |
| New Bedford | 24 | | | 3 | 1 | 64 |
| New Haven | 44 | 12.2 | 13.4 | 7 | 6 | 107 |
| New Orleans | 153 | 18.6 | 20.2 | 13 | 10 | 65 |
| White | 88 | | | 7 | 5 | 49 |
| Colored | 65 | (2) | (2) | 6 | 5 | 101 |
| New York | 1,795 | 15.6 | 14.7 | 179 | 185 | 73 |
| Bronx Borough | 203 | 11.2 | 12.7 | 20 | 20 | 59 |
| Brooklyn Borough | 603 | 13.7 | 13.1 | 62 | 73 | 63 |
| Manhattan Borough | 751 | 22.4 | 19.4 | 79 | 73 | 97 |
| Queens Borough | 179 | 11.0 | 11.6 | 11 | 18 | 45 |
| Richmond Borough | 59 | 20.5 | 16.0 | 7 | 1 | 127 |
| Newark, N. J | 142 | 15.7 | 13.6 | 16 | 20 | 84 |
| Oakland | 68 | 13.0 | 14.5 | 6 | 5 | 67 |
| Oklahoma City | 33 | | | 5 | 2 | 100 |
| Omaha | 82 | 19.2 | 12.4 | 13 | 5 | 152 |
| Paterson | 35 | 12.6 | 17.7 | 3 | 4 | 53 |
| Philadelphia | 653 | 16.5 | 15.3 | 53 | 64 | 75 |
| Pittsburgh | 221 | 17.1 | 14.0 | 29 | 25 | 100 |
| Portland, Oreg | 79 | | | 2 | 2 | 23 |
| Providence | 100 | 18.3 | 11.2 | 8 | 8 | 70 |
| Richmond | 61 | 16.4 | 16.9 | 8 | 4 | 112 |
| White | 35 | | | 2 | 3 | 42 |
| Colored | 26 | (2) | (2) | 6 | 1 | 246 |
| Rochester | 91 | 14.5 | 13.4 | 8 | 5 | 68 |
| St. Louis | 285 | 17.6 | 18.0 | 26 | 19 | 88 |
| Salt Lake City [1] | 62 | 23.5 | 14.0 | 8 | 8 | 123 |
| San Antonio | 68 | 16.3 | 27.8 | 17 | 7 | |
| San Diego | 46 | 20.1 | 20.5 | 0 | 2 | 0 |
| San Francisco | 188 | 16.8 | 13.7 | 13 | 6 | 83 |
| Schenectady | 34 | 19.1 | 15.1 | 4 | 2 | 127 |
| Seattle | 95 | 13.0 | 10.6 | 7 | 0 | 74 |
| Somerville | 24 | 12.2 | 11.7 | 3 | 3 | 108 |
| Spokane | 39 | 18.7 | 20.6 | 7 | 0 | 182 |
| Springfield, Mass | 48 | 16.8 | 12.9 | 4 | 6 | 66 |
| Syracuse | 52 | 13.6 | 16.5 | 6 | 7 | 72 |
| Toledo | 74 | 12.4 | 14.7 | 7 | 15 | 65 |
| Trenton | 64 | 24.1 | 13.2 | 4 | 9 | 72 |
| Utica | 35 | 17.6 | 18.1 | 2 | 3 | 51 |
| Washington, D. C | 183 | 17.3 | 13.6 | 10 | 14 | 59 |
| White | 121 | | | 3 | 7 | 25 |
| Colored | 62 | (2) | (2) | 7 | 7 | 133 |
| Waterbury | 31 | | | 1 | 2 | 25 |
| Wilmington, Del | 35 | 14.2 | 8.5 | 4 | 1 | 104 |
| Worcester | 66 | 17.5 | 14.8 | 9 | 12 | 113 |
| Yonkers | 20 | 8.6 | 14.2 | 5 | 6 | 117 |
| Youngstown | 40 | 12.0 | 8.7 | 5 | 3 | 72 |

[1] Deaths for week ended Friday.

[2] 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; Houston, 25; 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

**Reports for Weeks Ended March 2, 1929, and March 3, 1928**

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 2, 1929, and March 3, 1928*

| Division and State | Diphtheria | | Influenza | | Measles | | Meningococcus meningitis | |
|---|---|---|---|---|---|---|---|---|
| | Week ended Mar. 2, 1929 | Week ended Mar. 3, 1928 | Week ended Mar. 2, 1929 | Week ended Mar. 3, 1928 | Week ended Mar. 2, 1929 | Week ended Mar. 3, 1928 | Week ended Mar. 2, 1929 | Week ended Mar. 3, 1928 |
| New England States: | | | | | | | | |
| Maine | 1 | 6 | 124 | ------- | 395 | 35 | 1 | 0 |
| New Hampshire | 1 | 4 | 55 | 11 | 16 | 33 | 0 | 0 |
| Vermont | ------- | ------- | 2 | ------- | 66 | 21 | 0 | 0 |
| Massachusetts | 77 | 100 | 211 | 9 | 350 | 1,993 | 3 | 1 |
| Rhode Island | 8 | 9 | 8 | 1 | 77 | 29 | 0 | 0 |
| Connecticut [1] | 26 | 20 | 5,053 | 3 | 381 | 358 | 2 | 1 |
| Middle Atlantic States: | | | | | | | | |
| New York | 254 | 388 | [2] 101 | [2] 40 | 917 | 2,108 | 40 | 15 |
| New Jersey | 124 | 122 | 54 | 16 | 329 | 774 | 8 | 1 |
| Pennsylvania | 173 | 310 | ------- | ------- | 2,440 | 1,864 | 13 | 9 |
| East North Central States: | | | | | | | | |
| Ohio | 102 | 95 | 187 | 41 | 1,664 | 495 | 8 | 0 |
| Indiana | 22 | 25 | 34 | 31 | 419 | 190 | 0 | 0 |
| Illinois | 176 | 151 | 258 | 60 | 983 | 151 | 9 | 7 |
| Michigan | 93 | 77 | 34 | 8 | 542 | 1,135 | 34 | 6 |
| Wisconsin | 15 | 26 | 256 | 57 | 930 | 89 | 12 | 6 |
| West North Central States: | | | | | | | | |
| Minnesota | 23 | 13 | 4 | 5 | 470 | 13 | 2 | 0 |
| Iowa | 7 | 10 | ------- | ------- | 7 | 16 | 3 | 1 |
| Missouri | 54 | 54 | 143 | 47 | 496 | 184 | 34 | 3 |
| North Dakota | 6 | 8 | ------- | ------- | 54 | 7 | 0 | 0 |
| South Dakota | 1 | ------- | ------- | 3 | 92 | 39 | 0 | 0 |
| Nebraska | 15 | 17 | 8 | 17 | 95 | 8 | 5 | 2 |
| Kansas | 13 | 17 | 5 | 46 | 157 | 42 | 2 | 0 |
| South Atlantic States: | | | | | | | | |
| Delaware | 1 | 2 | ------- | 2 | 39 | 8 | 0 | 0 |
| Maryland [3] | 26 | 44 | 398 | 51 | 145 | 1,012 | 0 | 0 |
| District of Columbia | 11 | 21 | 10 | ------- | 11 | 113 | 0 | 0 |
| Virginia | ------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- |
| West Virginia | 14 | 12 | 72 | 34 | 167 | 87 | 3 | 0 |
| North Carolina | 42 | 20 | ------- | ------- | 104 | 3,692 | 1 | 1 |
| South Carolina | 21 | 19 | 1,053 | 1,028 | 10 | 1,237 | 0 | 0 |
| Georgia | 14 | 13 | 270 | 211 | 59 | 321 | 3 | 2 |
| Florida | 19 | 26 | 22 | 4 | 41 | 11 | 0 | 1 |

[1] Figures for 1929 include delayed reports.
[2] New York City only.
[3] Week ended Friday.

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 2, 1929, and March 3, 1928*—Continued

| Division and State | Diphtheria | | Influenza | | Measles | | Meningococcus meningitis | |
|---|---|---|---|---|---|---|---|---|
| | Week ended Mar. 2, 1929 | Week ended Mar. 3, 1928 | Week ended Mar. 2, 1929 | Week ended Mar. 3, 1928 | Week ended Mar. 2, 1929 | Week ended Mar. 3, 1928 | Week ended Mar. 2, 1929 | Week ended Mar. 3, 1928 |
| East South Central States: | | | | | | | | |
| Kentucky | ------- | 2 | 30 | ------- | 19 | 241 | 0 | 0 |
| Tennessee | 7 | 8 | 222 | 136 | 4 | 201 | 3 | 2 |
| Alabama | 17 | 34 | 279 | 247 | 136 | 292 | 1 | 0 |
| Mississippi | 4 | 12 | ------- | ------- | ------- | ------- | 1 | 2 |
| West South Central States: | | | | | | | | |
| Arkansas | 4 | 13 | 270 | 609 | 132 | 626 | 1 | 1 |
| Louisiana | 22 | 20 | 104 | 77 | 180 | 247 | 9 | 0 |
| Oklahoma [4] | 16 | 25 | 459 | 235 | 11 | 257 | 3 | 2 |
| Texas | 49 | 36 | 244 | 196 | 75 | 671 | 2 | 2 |
| Mountain States: | | | | | | | | |
| Montana | ------- | 13 | 5 | ------- | 115 | 3 | 1 | 4 |
| Idaho | ------- | 1 | 1 | ------- | 1 | ------- | 7 | 3 |
| Wyoming | ------- | ------- | 1 | ------- | 6 | 10 | 0 | 1 |
| Colorado | 18 | 10 | 5 | 24 | 3 | 30 | 8 | 12 |
| New Mexico | 17 | 4 | 3 | 5 | 3 | 168 | 2 | 0 |
| Arizona | 1 | 5 | 1 | 2 | ------- | 4 | 17 | 1 |
| Utah [3] | 2 | 6 | 15 | 3 | 1 | 1 | 26 | 1 |
| Pacific States: | | | | | | | | |
| Washington | 7 | 8 | 5 | 1 | 150 | 363 | 15 | 5 |
| Oregon | 10 | 17 | 96 | 33 | 185 | 98 | 2 | 2 |
| California | 59 | 121 | 167 | 57 | 40 | 205 | 22 | 6 |

| Division and State | Poliomyelitis | | Scarlet fever | | Smallpox | | Typhoid fever | |
|---|---|---|---|---|---|---|---|---|
| | Week ended Mar. 2, 1929 | Week ended Mar. 3, 1928 | Week ended Mar. 2, 1929 | Week ended Mar. 3, 1928 | Week ended Mar. 2, 1929 | Week ended Mar. 3, 1928 | Week ended Mar. 2, 1929 | Week ended Mar. 3, 1928 |
| New England States: | | | | | | | | |
| Maine | 0 | 0 | 46 | 26 | 4 | 0 | 0 | 2 |
| New Hampshire | 0 | 1 | 9 | 22 | 0 | 0 | 0 | 0 |
| Vermont | 0 | 0 | 9 | 2 | 2 | 0 | 0 | 0 |
| Massachusetts | 2 | 6 | 304 | 332 | 0 | 0 | 4 | 2 |
| Rhode Island | 0 | 0 | 19 | 36 | 0 | 0 | 0 | 0 |
| Connecticut [1] | 0 | 1 | 48 | 74 | 0 | 3 | 0 | 0 |
| Middle Atlantic States: | | | | | | | | |
| New York | 0 | 4 | 546 | 831 | 0 | 13 | 8 | 26 |
| New Jersey | 0 | 0 | 166 | 282 | 0 | 0 | 1 | 1 |
| Pennsylvania | 1 | 2 | 514 | 785 | 0 | 0 | 11 | 14 |
| East North Central States: | | | | | | | | |
| Ohio | 1 | 1 | 364 | 423 | 40 | 33 | 9 | 4 |
| Indiana | 0 | 0 | 255 | 180 | 41 | 126 | 1 | 1 |
| Illinois | 1 | 1 | 524 | 393 | 89 | 40 | 2 | 8 |
| Michigan | 0 | 0 | 348 | 326 | 44 | 22 | 2 | 6 |
| Wisconsin | 0 | 0 | 184 | 204 | 5 | 33 | 12 | 0 |
| West North Central States: | | | | | | | | |
| Minnesota | 0 | 0 | 122 | 173 | 3 | 4 | 3 | 1 |
| Iowa | 0 | 0 | 188 | 105 | 15 | 63 | 0 | 1 |
| Missouri | 1 | 0 | 122 | 109 | 33 | 35 | 7 | 2 |
| North Dakota | 0 | 1 | 87 | 52 | 8 | 1 | 0 | 5 |
| South Dakota | 0 | 0 | 59 | 26 | 25 | 0 | 0 | 1 |
| Nebraska | 1 | 1 | 209 | 134 | 124 | 64 | 2 | 1 |
| Kansas | 0 | 0 | 150 | 188 | 60 | 49 | 0 | 0 |
| South Atlantic States: | | | | | | | | |
| Delaware | 0 | 0 | 7 | 2 | 0 | 0 | 0 | 0 |
| Maryland [3] | 0 | 2 | 73 | 74 | 0 | 0 | 6 | 4 |
| District of Columbia | 0 | 0 | 23 | 45 | 0 | 0 | 1 | 0 |
| Virginia | ------- | 1 | ------- | ------- | ------- | ------- | ------- | ------- |
| West Virginia | 0 | 1 | 32 | 51 | 43 | 9 | 10 | 0 |
| North Carolina | 0 | 1 | 44 | 33 | 25 | 119 | 1 | 2 |
| South Carolina | 0 | 2 | 14 | 9 | 1 | 7 | 4 | 3 |
| Georgia | 0 | 0 | 17 | 15 | 14 | 0 | 0 | 4 |
| Florida | 1 | 0 | 18 | 11 | 1 | 12 | 6 | 15 |

[1] Figures for 1929 include delayed reports.
[3] Week ended Friday.
[4] Figures for 1929 are exclusive of Oklahoma City and Tulsa; and for 1928 are exclusive of Tulsa.

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended March 2, 1929, and March 3, 1928*—Continued

| Division and State | Poliomyelitis | | Scarlet fever | | Smallpox | | Typhoid fever | |
|---|---|---|---|---|---|---|---|---|
| | Week ended Mar. 2, 1929 | Week ended Mar. 3, 1928 | Week ended Mar. 2, 1929 | Week ended Mar. 3, 1928 | Week ended Mar. 2, 1929 | Week ended Mar. 3, 1928 | Week ended Mar. 2, 1929 | Week ended Mar. 3, 1928 |
| East South Central States: | | | | | | | | |
| Kentucky | 0 | 0 | 72 | 51 | 5 | 11 | 1 | 2 |
| Tennessee | 0 | 0 | 41 | 38 | 0 | 34 | 7 | 4 |
| Alabama | 1 | 0 | 20 | 18 | 26 | 26 | 3 | 14 |
| Mississippi | 2 | 2 | 13 | 24 | 0 | 10 | 8 | 4 |
| West South Central States: | | | | | | | | |
| Arkansas | 0 | 0 | 25 | 19 | 2 | 8 | 0 | 2 |
| Louisiana | 0 | 2 | 42 | 8 | 13 | 22 | 17 | 7 |
| Oklahoma[4] | 0 | 1 | 45 | 60 | 58 | 94 | 5 | 3 |
| Texas | 0 | 0 | 70 | 89 | 102 | 92 | 39 | 4 |
| Mountain States: | | | | | | | | |
| Montana | 0 | 0 | 47 | 23 | 14 | 18 | 0 | 0 |
| Idaho | 0 | 1 | 8 | 5 | 9 | 4 | 6 | 1 |
| Wyoming | 0 | 0 | 4 | 6 | 2 | 5 | 0 | 0 |
| Colorado | 1 | 0 | 66 | 158 | 48 | 20 | 0 | 2 |
| New Mexico | 0 | 0 | 15 | 35 | 2 | 1 | 3 | 0 |
| Arizona | 1 | 0 | 14 | 4 | 10 | 67 | 8 | 0 |
| Utah[3] | 0 | 0 | 15 | 4 | 1 | 13 | 1 | 1 |
| Pacific States: | | | | | | | | |
| Washington | 0 | 4 | 32 | 49 | 33 | 46 | 7 | 0 |
| Oregon | 0 | 3 | 66 | 26 | 50 | 58 | 3 | 0 |
| California | 2 | 8 | 513 | 182 | 74 | 32 | 14 | 7 |

[3] Week ended Friday.
[4] Figures for 1929 are exclusive of Oklahoma City and Tulsa; and for 1928 are exclusive of Tulsa.

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| *December, 1928* | | | | | | | | | | |
| Hawaii Territory | 4 | 44 | 149 | ---- | 32 | ---- | ---- | 8 | ---- | 9 |
| Wyoming | 1 | 11 | 961 | ---- | 5 | ---- | 0 | 60 | 26 | 1 |
| *January, 1929* | | | | | | | | | | |
| Arkansas | 24 | 59 | 15,677 | 143 | 111 | 65 | 0 | 97 | 6 | 16 |
| California | 67 | 345 | 3,352 | 7 | 192 | 6 | 9 | 1,581 | 228 | 28 |
| Colorado | 31 | 16 | 311 | ---- | 55 | ---- | 0 | 92 | 99 | 0 |
| Idaho | 36 | 19 | 83 | ---- | 25 | ---- | 0 | 88 | 201 | 22 |
| Indiana | 3 | 162 | 2,629 | ---- | 577 | ---- | 0 | 535 | 243 | 5 |
| Kansas | 18 | 69 | 3,201 | ---- | 170 | ---- | 2 | 486 | 174 | 8 |
| Mississippi | 5 | 83 | 62,829 | 1,520 | 1,888 | 292 | 2 | 70 | 6 | 23 |
| Montana | 21 | 6 | 1,423 | ---- | 541 | ---- | 0 | 154 | 63 | 1 |
| Oregon | 9 | 71 | 1,749 | ---- | 255 | ---- | 0 | 112 | 205 | 2 |
| South Dakota | 5 | 7 | 283 | ---- | 183 | ---- | 0 | 195 | 183 | 3 |
| Virginia | 6 | 173 | 53,088 | 33 | 446 | 17 | 0 | 233 | 6 | 14 |
| Washington | 25 | 55 | 639 | ---- | 222 | ---- | 1 | 141 | 260 | 8 |
| Wyoming | 4 | 6 | 739 | ---- | 9 | ---- | 0 | 54 | 18 | 0 |
| *February, 1929* | | | | | | | | | | |
| Porto Rico | ---- | 80 | 179 | 1,432 | 489 | 4 | 0 | ---- | 0 | 60 |

*December, 1928*

| | Cases |
|---|---|
| Chicken pox: | |
| Hawaii Territory | 19 |
| Wyoming | 104 |
| Conjunctivitis (follicular): | |
| Hawaii Territory | 113 |
| Impetigo contagiosa: | |
| Hawaii Territory | 5 |
| Leprosy: | |
| Hawaii Territory | 2 |
| Mumps: | |
| Hawaii Territory | 10 |
| Wyoming | 34 |
| Tetanus: | |
| Hawaii Territory | 4 |
| Trachoma: | |
| Hawaii Territory | 165 |
| Whooping cough: | |
| Hawaii Territory | 183 |
| Wyoming | 15 |

*January, 1929*

| | Cases |
|---|---|
| Chicken pox: | |
| Arkansas | 307 |
| California | 1,462 |
| Colorado | 195 |
| Idaho | 45 |
| Indiana | 331 |
| Kansas | 515 |
| Mississippi | 881 |
| Montana | 97 |
| Oregon | 128 |
| South Dakota | 75 |
| Virginia | 639 |
| Washington | 466 |
| Wyoming | 47 |
| Dysentery: | |
| California (amebic) | 3 |
| California (bacillary) | 2 |
| Mississippi (amebic) | 46 |
| Mississippi (bacillary) | 165 |
| Virginia | 32 |
| German measles: | |
| California | 70 |
| Colorado | 8 |
| Kansas | 139 |
| Montana | 3 |
| Washington | 40 |
| Wyoming | 3 |
| Granuloma, coccidoidal: | |
| California | 2 |
| Hookworm disease: | |
| Mississippi | 176 |
| Virginia | 13 |
| Impetigo contagiosa: | |
| Colorado | 12 |
| Oregon | 11 |
| Washington | 6 |
| Jaundice (epidemic): | |
| California | 1 |
| Lethargic encephalitis: | |
| California | 10 |
| Oregon | 1 |
| South Dakota | 1 |
| Washington | 1 |

*January, 1929*—Continued

| | Cases |
|---|---|
| Mumps: | |
| Arkansas | 92 |
| California | 1,152 |
| Colorado | 116 |
| Idaho | 15 |
| Indiana | 43 |
| Kansas | 278 |
| Mississippi | 391 |
| Montana | 11 |
| Oregon | 104 |
| South Dakota | 30 |
| Washington | 241 |
| Wyoming | 26 |
| Ophthalmia neonatorum: | |
| Arkansas | 2 |
| California | 4 |
| Kansas | 1 |
| Mississippi | 16 |
| Paratyphoid fever: | |
| Arkansas | 2 |
| California | 4 |
| Puerperal septicemia: | |
| Mississippi | 23 |
| Rabies in animals: | |
| California | 68 |
| Idaho | 1 |
| Mississippi | 8 |
| Oregon | 1 |
| Rabies in man: | |
| Indiana | 3 |
| Kansas | 1 |
| Scabies: | |
| Montana | 1 |
| Oregon | 8 |
| Washington | 4 |
| Septic sore throat: | |
| Oregon | 7 |
| Washington | 1 |
| Tetanus: | |
| California | 5 |
| Trachoma: | |
| Arkansas | 16 |
| California | 7 |
| Mississippi | 6 |
| Tularaemia: | |
| Kansas | 3 |
| Virginia | 1 |
| Undulant fever: | |
| California | 2 |
| Vincent's angina: | |
| California | 4 |
| Kansas | 3 |
| Whooping cough: | |
| Arkansas | 39 |
| California | 972 |
| Colorado | 39 |
| Idaho | 3 |
| Indiana | 248 |
| Kansas | 232 |
| Mississippi | 985 |
| Montana | 55 |
| Oregon | 5 |
| South Dakota | 19 |
| Virginia | 568 |

*January, 1929*—Continued

| Whooping cough—Continued. | Cases |
|---|---|
| Washington | 141 |
| Wyoming | 3 |

*February, 1929*

| Porto Rico: | |
|---|---|
| Colibacillosis | 2 |
| Dysentery | 241 |
| Filariasis | 2 |

*February, 1929*—Continued

| Porto Rico—Continued. | Cases |
|---|---|
| Leprosy | 1 |
| Mumps | 35 |
| Ophthalmia neonatorum | 3 |
| Puerperal fever | 16 |
| Tetanus | 16 |
| Tetanus, infantile | 38 |
| Trachoma | 2 |
| Whooping cough | 62 |

## 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 31,490,000. The estimated population of the 90 cities reporting deaths is more than 29,920,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

*Weeks ended February 23, 1929, and February 25, 1928*

| | 1929 | 1928 | Estimated expectancy |
|---|---|---|---|
| *Cases reported* | | | |
| Diphtheria: | | | |
| 46 States | 1,371 | 2,010 | ---- |
| 97 cities | 713 | 1,051 | 976 |
| Measles: | | | |
| 45 States | 8,681 | 16,969 | ---- |
| 97 cities | 2,766 | 5,893 | ---- |
| Meningococcus meningitis: | | | |
| 45 States | 194 | 89 | ---- |
| 97 cities | 121 | 39 | ---- |
| Poliomyelitis: | | | |
| 46 States | 22 | 37 | ---- |
| Scarlet fever: | | | |
| 46 States | 4,466 | 5,311 | ---- |
| 97 cities | 1,578 | 1,725 | 1,581 |
| Smallpox: | | | |
| 46 States | 963 | 1,215 | ---- |
| 97 cities | 71 | 148 | 103 |
| Typhoid fever: | | | |
| 46 States | 152 | 219 | ---- |
| 97 cities | 26 | 32 | 32 |
| *Deaths reported* | | | |
| Influenza and pneumonia: | | | |
| 90 cities | 1,374 | 1,054 | ---- |
| Smallpox: | | | |
| 90 cities | 0 | 0 | ---- |

## *City reports for week ended February 23, 1929*

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 1920 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, 1928, 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 | 78,600 | 0 | 2 | 0 | ------- | 0 | 44 | 0 | 4 |
| New Hampshire: | | | | | | | | | |
| Concord | (1) | 0 | 0 | 0 | ------- | 0 | 0 | 0 | 4 |
| Manchester | 85,700 | 0 | 1 | 1 | ------- | 6 | 0 | 0 | 3 |
| Nashua | (1) | 0 | 1 | 0 | ------- | 0 | 0 | 0 | 1 |
| Vermont: | | | | | | | | | |
| Barre | (1) | 0 | 0 | 0 | ------- | 0 | 0 | 2 | 1 |
| Massachusetts: | | | | | | | | | |
| Boston | 799,200 | 23 | 46 | 17 | 33 | 3 | 6 | 10 | 46 |
| Fall River | 134,300 | 0 | 4 | 4 | 3 | 3 | 3 | 0 | 6 |
| Springfield | 149,800 | 3 | 3 | 10 | 1 | 1 | 50 | 1 | 3 |
| Worcester | 197,600 | 1 | 3 | 2 | 3 | 2 | 6 | 1 | 3 |
| Rhode Island: | | | | | | | | | |
| Pawtucket | 73,100 | ------- | 1 | ------- | ------- | ------- | ------- | ------- | ------- |
| Providence | 286,300 | 0 | 10 | 14 | 1 | 4 | 37 | 1 | 11 |
| Connecticut: | | | | | | | | | |
| Bridgeport | (1) | 0 | 8 | 0 | 26 | 3 | 3 | 2 | 9 |
| Hartford | 172,300 | 15 | 8 | 1 | 4 | 1 | 15 | 3 | 6 |
| New Haven | 187,900 | 16 | 2 | 1 | 13 | 1 | 1 | 2 | 10 |
| **MIDDLE ATLANTIC** | | | | | | | | | |
| New York: | | | | | | | | | |
| Buffalo | 555,800 | 15 | 16 | 15 | 1 | 0 | 3 | 2 | 22 |
| New York | 6,017,500 | 259 | 225 | 178 | 126 | 47 | 72 | 96 | 236 |
| Rochester | 328,200 | 16 | 10 | 2 | 5 | 1 | 19 | 17 | 7 |
| Syracuse | 199,300 | 10 | 5 | 0 | ------- | 0 | 0 | 11 | 10 |
| New Jersey: | | | | | | | | | |
| Camden | 135,400 | 4 | 6 | 7 | 3 | 1 | 2 | 0 | 2 |
| Newark | 473,600 | 41 | 16 | 48 | 12 | 4 | 11 | 61 | 12 |
| Trenton | 139,000 | 0 | 3 | 1 | 3 | 2 | 1 | 0 | 4 |
| Pennsylvania: | | | | | | | | | |
| Philadelphia | 2,064,200 | 95 | 73 | 26 | 28 | 12 | 26 | 7 | 71 |
| Pittsburgh | 673,800 | 49 | 23 | 7 | 23 | 5 | 11 | 4 | 30 |
| Reading | 115,400 | 3 | 3 | 5 | ------- | 0 | 145 | 0 | 3 |
| Scranton | 144,700 | 1 | 4 | 2 | ------- | 0 | 42 | 0 | 0 |
| **EAST NORTH CENTRAL** | | | | | | | | | |
| Ohio: | | | | | | | | | |
| Cincinnati | 413,700 | 10 | 10 | 7 | 1 | 5 | 1 | 0 | 23 |
| Cleveland | 1,010,300 | 69 | 32 | 22 | 18 | 6 | 350 | 12 | 34 |
| Columbus | 299,000 | 11 | 4 | 0 | 7 | 7 | 5 | 0 | 11 |
| Toledo | 313,200 | 23 | 7 | 5 | 1 | 1 | 4 | 18 | 9 |
| Indiana: | | | | | | | | | |
| Fort Wayne | 105,300 | 5 | 3 | 0 | ------- | 2 | 11 | 0 | 3 |
| Indianapolis | 382,100 | 56 | 7 | 3 | ------- | 3 | 69 | 2 | 15 |
| South Bend | 86,100 | 6 | 1 | 0 | ------- | 0 | 39 | 0 | 3 |
| Terre Haute | 73,500 | 2 | 1 | 2 | ------- | 0 | 3 | 0 | 5 |
| Illinois: | | | | | | | | | |
| Chicago | 3,157,400 | 80 | 82 | 80 | 42 | 15 | 180 | 7 | 85 |
| Springfield | 67,200 | 5 | 1 | 0 | 4 | 3 | 0 | 0 | 0 |

[1] No estimate of population made.

*City reports for week ended February 23, 1929*—Continued

| Division, State, and city | Population July 1, 1928, 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** | | | | | | | | | |
| Michigan: | | | | | | | | | |
| Detroit | 1,378,900 | 65 | 57 | 45 | 33 | 9 | 22 | 18 | 60 |
| Flint | 148,800 | 24 | 3 | 1 | ------- | 2 | 4 | 0 | 8 |
| Grand Rapids | 164,200 | 7 | 3 | 0 | ------- | 0 | 112 | 0 | 5 |
| Wisconsin: | | | | | | | | | |
| Kenosha | 56,500 | 3 | 1 | 0 | ------- | 0 | 34 | 1 | 0 |
| Milwaukee | 544,200 | 67 | 19 | 3 | 2 | 0 | 279 | 4 | 9 |
| Racine | 74,400 | 9 | 3 | 3 | ------- | 0 | 275 | 0 | 2 |
| Superior | (1) | 1 | 0 | 0 | ------- | 0 | 0 | 1 | 3 |
| **WEST NORTH CENTRAL** | | | | | | | | | |
| Minnesota: | | | | | | | | | |
| Duluth | 116,800 | 14 | 0 | 0 | ------- | 4 | 0 | 44 | 2 |
| Minneapolis | 455,900 | 52 | 16 | 7 | ------- | 2 | 266 | 40 | 19 |
| St. Paul | (1) | 17 | 12 | 0 | ------- | 3 | 144 | 25 | 9 |
| Iowa: | | | | | | | | | |
| Davenport | (1) | 5 | 1 | 0 | ------- | ------- | 0 | 0 | ------- |
| Des Moines | 151,900 | 0 | 3 | 0 | ------- | ------- | 0 | 0 | ------- |
| Sioux City | 80,000 | 11 | 1 | 0 | ------- | ------- | 1 | 1 | ------- |
| Waterloo | 37,100 | 0 | 0 | 0 | ------- | ------- | 1 | 40 | ------- |
| Missouri: | | | | | | | | | |
| Kansas City | 391,000 | 7 | 7 | 3 | ------- | 3 | 196 | 0 | 17 |
| St. Joseph | 78,500 | 2 | 1 | 1 | ------- | 0 | 18 | 0 | 8 |
| St. Louis | 848,100 | 18 | 50 | 49 | 8 | ------- | 21 | 5 | ------- |
| North Dakota: | | | | | | | | | |
| Fargo | (1) | 1 | 0 | 0 | ------- | 0 | 4 | 1 | 0 |
| Grand Forks | (1) | 0 | 0 | 0 | ------- | ------- | 0 | 0 | ------- |
| South Dakota: | | | | | | | | | |
| Aberdeen | (1) | 0 | 0 | 0 | ------- | ------- | 22 | 0 | ------- |
| Sioux Falls | (1) | 0 | 0 | 0 | ------- | ------- | 97 | 0 | ------- |
| Nebraska: | | | | | | | | | |
| Omaha | 222,800 | 8 | 4 | 6 | ------- | 0 | 0 | 2 | 7 |
| Kansas: | | | | | | | | | |
| Topeka | 62,800 | 16 | 1 | 1 | 4 | 3 | ------- | 0 | 1 |
| Wichita | 99,300 | 0 | 3 | 1 | ------- | 0 | 0 | 5 | 6 |
| **SOUTH ATLANTIC** | | | | | | | | | |
| Delaware: | | | | | | | | | |
| Wilmington | 128,500 | 6 | 2 | 0 | ------- | 1 | 16 | 0 | 4 |
| Maryland: | | | | | | | | | |
| Baltimore | 830,400 | 59 | 29 | 10 | 122 | 9 | 2 | 97 | 49 |
| Cumberland | (1) | 0 | 1 | 0 | 2 | 0 | 3 | 3 | 3 |
| Frederick | (1) | 0 | 0 | 0 | ------- | 0 | 0 | 0 | 1 |
| District of Columbia: | | | | | | | | | |
| Washington | 552,000 | 33 | 18 | 18 | 28 | 4 | 8 | 9 | 15 |
| Virginia: | | | | | | | | | |
| Lynchburg | 38,600 | 4 | 1 | 0 | ------- | 0 | 1 | 42 | 1 |
| Norfolk | 184,200 | 10 | 1 | 0 | 8 | 0 | 2 | 108 | 17 |
| Richmond | 194,400 | 2 | 3 | 1 | 2 | 5 | 1 | 2 | 11 |
| Roanoke | 64,600 | 4 | 1 | 0 | ------- | 2 | 0 | 2 | 2 |
| West Virginia: | | | | | | | | | |
| Charleston | 55,200 | 2 | 0 | 0 | ------- | 0 | 6 | 0 | 1 |
| Wheeling | (1) | 9 | 1 | 0 | 6 | 2 | 50 | 10 | 2 |
| North Carolina: | | | | | | | | | |
| Raleigh | (1) | 5 | 0 | 0 | ------- | 2 | 0 | 0 | 4 |
| Wilmington | 39,100 | 5 | 0 | 0 | ------- | 0 | 0 | 0 | 4 |
| Winston-Salem | 80,000 | 3 | 1 | 4 | ------- | 0 | 0 | 1 | 10 |
| South Carolina: | | | | | | | | | |
| Charleston | 75,900 | 2 | 0 | 0 | 11 | 1 | 0 | 0 | 8 |
| Columbia | 50,600 | 3 | 1 | 0 | ------- | 1 | 1 | 0 | 1 |
| Greenville | (1) | 2 | 0 | 0 | ------- | 0 | 0 | 5 | 2 |
| Georgia: | | | | | | | | | |
| Atlanta | 255,100 | 2 | 3 | 2 | 56 | 7 | 1 | 4 | 7 |
| Brunswick | (1) | 4 | 0 | 0 | ------- | 0 | 0 | 0 | 1 |
| Savannah | 99,900 | 0 | 1 | 0 | 8 | 2 | 0 | 0 | 3 |
| Florida: | | | | | | | | | |
| Miami | 156,700 | 3 | 2 | 5 | 1 | 0 | 14 | 0 | 2 |
| St. Petersburg | 53,300 | ------- | 0 | ------- | ------- | 0 | ------- | ------- | 0 |
| Tampa | 113,400 | 2 | 2 | 1 | ------- | 1 | 0 | 2 | 0 |

[1] No estimate of population made.

*City reports for week ended February 23, 1929*—Continued

| Division, State, and city | Population July 1, 1928, 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 | 59,000 | 1 | 0 | 1 | ------- | 0 | 0 | 0 | 2 |
| Tennessee: | | | | | | | | | |
| Memphis | 190,200 | 4 | 4 | 5 | ------- | 5 | 0 | 1 | 6 |
| Nashville | 139,600 | 0 | 1 | 1 | ------- | 4 | 0 | 0 | 8 |
| Alabama: | | | | | | | | | |
| Birmingham | 222,400 | 2 | 2 | 2 | 50 | 2 | 0 | 7 | 5 |
| Mobile | 69,600 | 0 | 1 | 1 | 7 | 0 | 0 | 0 | 0 |
| Montgomery | 63,100 | 7 | 1 | 0 | 4 | ------- | 0 | 0 | ------- |
| WEST SOUTH CENTRAL | | | | | | | | | |
| Arkansas: | | | | | | | | | |
| Fort Smith | (1) | 0 | 0 | 0 | ------- | ------- | 0 | 1 | ------- |
| Little Rock | 79,200 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 4 |
| Louisiana: | | | | | | | | | |
| New Orleans | 429,400 | 0 | 13 | 22 | 32 | 19 | 12 | 0 | 22 |
| Shreveport | 81,300 | 0 | 1 | 0 | ------- | 0 | 0 | 1 | 3 |
| Oklahoma: | | | | | | | | | |
| Tulsa | 170,500 | 15 | 1 | 2 | ------- | ------- | 1 | 1 | ------- |
| Texas: | | | | | | | | | |
| Dallas | 217,800 | 11 | 6 | 15 | 5 | 9 | 5 | 0 | 10 |
| Fort Worth | 170,600 | 11 | 3 | 18 | 6 | 3 | 4 | 0 | 5 |
| Galveston | 50,600 | 0 | 1 | 0 | ------- | 0 | 0 | 0 | 1 |
| Houston | (1) | 2 | 3 | 6 | ------- | 0 | 0 | 0 | 9 |
| San Antonio | 218,100 | 0 | 2 | 2 | ------- | 5 | 2 | 0 | 15 |
| MOUNTAIN | | | | | | | | | |
| Montana: | | | | | | | | | |
| Billings | (1) | 1 | 1 | 0 | ------- | 0 | 0 | 0 | 0 |
| Great Falls | (1) | 5 | 0 | 0 | ------- | 1 | 48 | 4 | 1 |
| Helena | (1) | 0 | 0 | 0 | ------- | 0 | 25 | 0 | 2 |
| Missoula | (1) | 0 | 0 | 0 | 2 | 2 | 30 | 0 | 1 |
| Idaho: | | | | | | | | | |
| Boise | (1) | 2 | 0 | 0 | ------- | 0 | 0 | 0 | 0 |
| Colorado: | | | | | | | | | |
| Denver | 294,200 | 4 | 11 | 3 | 24 | 4 | 2 | 16 | 15 |
| Pueblo | 44,200 | 18 | 1 | 1 | ------- | 0 | 0 | 0 | 2 |
| New Mexico: | | | | | | | | | |
| Albuquerque | (1) | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 1 |
| Utah: | | | | | | | | | |
| Salt Lake City | 138,000 | 34 | 2 | 1 | ------- | 2 | 1 | 105 | 4 |
| Nevada: | | | | | | | | | |
| Reno | (1) | 0 | 0 | 0 | ------- | 0 | 0 | 0 | 1 |
| PACIFIC | | | | | | | | | |
| Washington: | | | | | | | | | |
| Seattle | 383,200 | 27 | 6 | 8 | ------- | ------- | 3 | 11 | ------- |
| Spokane | 109,100 | 13 | 3 | 4 | 6 | ------- | 44 | 0 | ------- |
| Tacoma | 110,500 | 8 | 1 | 1 | ------- | 0 | 0 | 21 | 3 |
| Oregon: | | | | | | | | | |
| Portland | (1) | 12 | 8 | 5 | 6 | 3 | 56 | 3 | 13 |
| Salem | (1) | 0 | 0 | 0 | 2 | 0 | 2 | 9 | 0 |
| California: | | | | | | | | | |
| Los Angeles | (1) | 70 | 39 | 17 | 66 | 7 | 11 | 26 | 29 |
| Sacramento | 75,700 | 12 | 2 | 2 | 6 | 2 | 0 | 4 | 3 |
| San Francisco | 585,300 | 34 | 22 | 12 | 14 | 3 | 2 | 2 | 6 |

[1] No estimate of population made.

*City reports for week ended February 23, 1929*—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 | 3 | 7 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 25 |
| New Hampshire: | | | | | | | | | | | |
| Concord | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| Manchester | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| Nashua | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 6 |
| Vermont: | | | | | | | | | | | |
| Barre | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 5 |
| Massashusetts: | | | | | | | | | | | |
| Boston | 83 | 68 | 0 | 0 | 0 | 11 | 1 | 1 | 0 | 26 | 219 |
| Fall River | 4 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 4 | 39 |
| Springfield | 10 | 9 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 46 |
| Worcester | 10 | 6 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 8 | 64 |
| Rhode Island: | | | | | | | | | | | |
| Pawtucket | 2 | | 0 | | | | 0 | | | | |
| Providence | 12 | 13 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 4 | 79 |
| Connecticut: | | | | | | | | | | | |
| Bridgeport | 13 | 7 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 39 |
| Hartford | 6 | 4 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 7 | 32 |
| New Haven | 11 | 5 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 3 | 38 |
| **MIDDLE ATLANTIC** | | | | | | | | | | | |
| New York: | | | | | | | | | | | |
| Buffalo | 28 | 27 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 35 | 149 |
| New York | 347 | 259 | 0 | 0 | 0 | 113 | 7 | 7 | 0 | 58 | 1,694 |
| Rochester | 12 | 4 | 0 | 0 | 0 | 4 | 1 | 0 | 0 | 17 | 89 |
| Syracuse | 16 | 5 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 30 | 61 |
| New Jersey: | | | | | | | | | | | |
| Camden | 7 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 31 |
| Newark | 42 | 20 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 23 | 142 |
| Trenton | 5 | 3 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 43 |
| Pennsylvania: | | | | | | | | | | | |
| Philadelphia | 100 | 65 | 0 | 0 | 0 | 35 | 2 | 1 | 0 | 57 | 556 |
| Pittsburgh | 35 | 24 | 0 | 0 | 0 | 16 | 1 | 1 | 1 | 30 | 212 |
| Reading | 5 | 9 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 5 | 20 |
| Scranton | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | |
| **EAST NORTH CENTRAL** | | | | | | | | | | | |
| Ohio: | | | | | | | | | | | |
| Cincinnati | 22 | 45 | 1 | 6 | 0 | 13 | 0 | 1 | 0 | 20 | 164 |
| Cleveland | 53 | 34 | 0 | 1 | 0 | 22 | 0 | 0 | 0 | 75 | 250 |
| Columbus | 12 | 1 | 2 | 0 | 0 | 4 | 1 | 0 | 0 | 7 | 95 |
| Toledo | 12 | 13 | 0 | 1 | 0 | 6 | 1 | 0 | 0 | 75 | 78 |
| Indiana: | | | | | | | | | | | |
| Fort Wayne | 6 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 36 |
| Indianapolis | 12 | 43 | 13 | 4 | 0 | 7 | 1 | 0 | 0 | 31 | 111 |
| South Bend | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| Terre Haute | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 |
| Illinois: | | | | | | | | | | | |
| Chicago | 142 | 129 | 3 | 1 | 0 | 53 | 3 | 2 | 0 | 28 | 766 |
| Springfield | 3 | 10 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 31 |
| Michigan: | | | | | | | | | | | |
| Detroit | 105 | 183 | 3 | 2 | 0 | 28 | 1 | 0 | 0 | 79 | 347 |
| Flint | 10 | 21 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 4 | 42 |
| Grand Rapids | 11 | 12 | 0 | 5 | 0 | 3 | 0 | 0 | 0 | 16 | 36 |
| Wisconsin: | | | | | | | | | | | |
| Kenosha | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | |
| Milwaukee | 33 | 36 | 0 | 1 | 0 | 4 | 0 | 0 | 0 | 77 | 100 |
| Racine | 6 | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 8 | 12 |
| Superior | 4 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| **WEST NORTH CENTRAL** | | | | | | | | | | | |
| Minnesota: | | | | | | | | | | | |
| Duluth | 8 | 6 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 30 |
| Minneapolis | 61 | 19 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 38 | 115 |
| St. Paul | 36 | 23 | 2 | 0 | 0 | 2 | 0 | 1 | 0 | 38 | 51 |

*City reports for week ended February 23, 1929*—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 | | | | | | | | | | | |
| Iowa: | | | | | | | | | | | |
| Davenport | 2 | 0 | 1 | 6 | ---- | ---- | 0 | 1 | ---- | 2 | ---- |
| Des Moines | 6 | 29 | 2 | 1 | ---- | ---- | 0 | 0 | ---- | 0 | 44 |
| Sioux City | 2 | 0 | 1 | 0 | ---- | ---- | 0 | 0 | ---- | 1 | ---- |
| Waterloo | 2 | 70 | 0 | 0 | ---- | ---- | 0 | 0 | ---- | 10 | ---- |
| Missouri: | | | | | | | | | | | |
| Kansas City | 14 | 29 | 3 | 4 | 0 | 5 | 0 | 0 | 0 | 6 | 123 |
| St. Joseph | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 27 |
| St. Louis | 45 | 21 | 3 | 1 | 0 | 7 | 1 | 2 | 0 | 44 | 274 |
| North Dakota: | | | | | | | | | | | |
| Fargo | 2 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 4 | 16 |
| Grand Forks | 1 | 5 | 1 | 0 | ---- | ---- | 0 | 0 | ---- | 0 | ---- |
| South Dakota: | | | | | | | | | | | |
| Aberdeen | 3 | 0 | 0 | 0 | ---- | ---- | 0 | 0 | ---- | 0 | ---- |
| Sioux Falls | 3 | 3 | 0 | 0 | ---- | ---- | 0 | 0 | ---- | 0 | 5 |
| Nebraska: | | | | | | | | | | | |
| Omaha | 5 | 3 | 5 | 1 | 0 | 3 | 0 | 0 | 0 | 2 | 68 |
| Kansas: | | | | | | | | | | | |
| Topeka | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 14 |
| Wichita | 4 | 19 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 42 |
| SOUTH ATLANTIC | | | | | | | | | | | |
| Delaware: | | | | | | | | | | | |
| Wilmington | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| Maryland: | | | | | | | | | | | |
| Baltimore | 41 | 26 | 0 | 0 | 0 | 17 | 1 | 0 | 0 | 88 | 263 |
| Cumberland | 1 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 9 |
| Frederick | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| District of Columbia: | | | | | | | | | | | |
| Washington | 27 | 25 | 1 | 0 | 0 | 17 | 1 | 0 | 0 | 36 | 161 |
| Virginia: | | | | | | | | | | | |
| Lynchburg | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 19 |
| Norfolk | 3 | 2 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 4 | ---- |
| Richmond | 4 | 4 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 2 | 81 |
| Roanoke | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| West Virginia: | | | | | | | | | | | |
| Charleston | 1 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 5 | 25 |
| Wheeling | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 21 |
| North Carolina: | | | | | | | | | | | |
| Raleigh | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| Wilmington | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 11 |
| Winston-Salem | 1 | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 7 | 22 |
| South Carolina: | | | | | | | | | | | |
| Charleston | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 37 |
| Columbia | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 14 |
| Greenville | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 6 | 12 |
| Georgia: | | | | | | | | | | | |
| Atlanta | 5 | 10 | 4 | 2 | 0 | 8 | 0 | 0 | 0 | 11 | 89 |
| Brunswick | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Savannah | 1 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 9 | 29 |
| Florida: | | | | | | | | | | | |
| Miami | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 32 |
| St. Petersburg | 0 | ---- | 0 | ---- | 0 | 0 | 0 | ---- | 0 | ---- | 12 |
| Tampa | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 7 | 23 |
| EAST SOUTH CENTRAL | | | | | | | | | | | |
| Kentucky: | | | | | | | | | | | |
| Covington | 2 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| Tennessee: | | | | | | | | | | | |
| Memphis | 6 | 12 | 2 | 0 | 0 | 4 | 1 | 0 | 0 | 1 | 63 |
| Nashville | 4 | 3 | 1 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 42 |
| Alabama: | | | | | | | | | | | |
| Birmingham | 2 | 4 | 6 | 0 | 0 | 4 | 0 | 0 | 0 | 2 | 64 |
| Mobile | 1 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 18 |
| Montgomery | 0 | 0 | 0 | 0 | ---- | ---- | 0 | 0 | ---- | 0 | ---- |

*City reports for week ended February 23, 1929*—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 | | | | | | | | | | | |
| Arkansas: | | | | | | | | | | | |
| Fort Smith | 1 | 0 | 0 | 0 | ---- | ---- | 0 | 0 | ---- | 0 | ---- |
| Little Rock | 1 | 4 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 3 | ---- |
| Louisiana: | | | | | | | | | | | |
| New Orleans | 8 | 40 | 2 | 0 | 0 | 22 | 2 | 1 | 0 | 0 | 199 |
| Shreveport | 1 | 3 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 26 |
| Oklahoma: | | | | | | | | | | | |
| Tulsa | 2 | 4 | 1 | 11 | ---- | ---- | 0 | 0 | ---- | 5 | ---- |
| Texas: | | | | | | | | | | | |
| Dallas | 3 | 10 | 4 | 23 | 0 | 0 | 0 | 0 | 0 | 1 | 61 |
| Fort Worth | 1 | 8 | 2 | 28 | 0 | 1 | 0 | 0 | 0 | 1 | 35 |
| Galveston | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 25 |
| Houston | 1 | 9 | 3 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 65 |
| San Antonio | 2 | 2 | 0 | 1 | 0 | 11 | 0 | 0 | 0 | 0 | 87 |
| MOUNTAIN | | | | | | | | | | | |
| Montana: | | | | | | | | | | | |
| Billings | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Great Falls | 2 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 4 | 11 |
| Helena | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| Missoula | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| Idaho: | | | | | | | | | | | |
| Boise | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| Colorado: | | | | | | | | | | | |
| Denver | 14 | 4 | 2 | 1 | 0 | 7 | 0 | 0 | 0 | 8 | 86 |
| Pueblo | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 12 |
| New Mexico: | | | | | | | | | | | |
| Albuquerque | 2 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 39 | 16 |
| Utah: | | | | | | | | | | | |
| Salt Lake City | 3 | 0 | 2 | 1 | 0 | 2 | 0 | 0 | 0 | 7 | 38 |
| Nevada: | | | | | | | | | | | |
| Reno | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| PACIFIC | | | | | | | | | | | |
| Washington: | | | | | | | | | | | |
| Seattle | 11 | 4 | 5 | 0 | ---- | ---- | 0 | 0 | ---- | 34 | ---- |
| Spokane | 6 | 4 | 10 | 1 | ---- | ---- | 0 | 0 | ---- | 0 | ---- |
| Tacoma | 3 | 2 | 3 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 26 |
| Oregon: | | | | | | | | | | | |
| Portland | 7 | 10 | 13 | 34 | 0 | 1 | 1 | 0 | 0 | 0 | 101 |
| Salem | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | ---- |
| California: | | | | | | | | | | | |
| Los Angeles | 33 | 56 | 7 | 0 | 0 | 26 | 1 | 2 | 0 | 18 | 311 |
| Sacramento | 2 | 23 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 9 | 42 |
| San Francisco | 17 | 32 | 3 | 0 | 0 | 8 | 0 | 0 | 0 | 16 | 174 |

| 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 | | | | | | | | | |
| New Hampshire: | | | | | | | | | |
| Manchester | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Massachusetts: | | | | | | | | | |
| Boston | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MIDDLE ATLANTIC | | | | | | | | | |
| New York: | | | | | | | | | |
| Buffalo | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| New York City | 29 | 18 | 2 | 2 | 0 | 0 | 1 | 3 | 0 |
| Rochester | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Syracuse | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

*City reports for week ended February 23, 1929*—Continued

| Division, State, and city | Meningococcus meningitis | | Lethargic encephalitis | | Pellagra | | Poliomyelitis (infantile paralysis) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Cases | Deaths | Cases | Deaths | Cases | Deaths | Cases, estimated expectancy | Cases | Deaths |
| **MIDDLE ATLANTIC—CON.** | | | | | | | | | |
| New Jersey: | | | | | | | | | |
| Newark | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Trenton | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Pennsylvania: | | | | | | | | | |
| Philadelphia | 8 | 5 | 1 | 1 | 0 | 0 | 1 | 0 | 1 |
| Pittsburgh | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **EAST NORTH CENTRAL** | | | | | | | | | |
| Ohio: | | | | | | | | | |
| Cincinnati | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cleveland | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Columbus | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Toledo | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Indiana: | | | | | | | | | |
| Indianapolis | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Illinois: | | | | | | | | | |
| Chicago | 15 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Michigan: | | | | | | | | | |
| Detroit | 18 | 9 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Flint | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wisconsin: | | | | | | | | | |
| Milwaukee | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **WEST NORTH CENTRAL** | | | | | | | | | |
| Minnesota: | | | | | | | | | |
| Duluth | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Iowa: | | | | | | | | | |
| Des Moines | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sioux City | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Missouri: | | | | | | | | | |
| Kansas City | 11 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| St. Louis | 6 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| North Dakota: | | | | | | | | | |
| Fargo | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **SOUTH ATLANTIC** | | | | | | | | | |
| Maryland: | | | | | | | | | |
| Baltimore | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 |
| Virginia: | | | | | | | | | |
| Lynchburg | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Richmond | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Roanoke | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| North Carolina: | | | | | | | | | |
| Wilmington | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Georgia: | | | | | | | | | |
| Atlanta | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| Savannah | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| Florida: | | | | | | | | | |
| Tampa | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **EAST SOUTH CENTRAL** | | | | | | | | | |
| Tennessee: | | | | | | | | | |
| Memphis | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nashville | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Alabama: | | | | | | | | | |
| Birmingham | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| Montgomery | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| **WEST SOUTH CENTRAL** | | | | | | | | | |
| Louisiana: | | | | | | | | | |
| New Orleans | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Oklahoma: | | | | | | | | | |
| Tulsa | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Texas: | | | | | | | | | |
| Dallas | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| Galveston | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Houston | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |

*City reports for week ended February 23, 1929*—Continued

| Division, State, and city | Meningococcus meningitis | | Lethargic encephalitis | | Pellagra | | Poliomyelitis (infantile paralysis) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Cases | Deaths | Cases | Deaths | Cases | Deaths | Cases, estimated expectancy | Cases | Deaths |
| MOUNTAIN | | | | | | | | | |
| Montana: | | | | | | | | | |
| Missoula | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Colorado: | | | | | | | | | |
| Denver | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pueblo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| Utah: | | | | | | | | | |
| Salt Lake | 6 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nevada: | | | | | | | | | |
| Reno | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PACIFIC | | | | | | | | | |
| Washington: | | | | | | | | | |
| Tacoma | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| California: | | | | | | | | | |
| Los Angeles | 3 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sacramento | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| San Francisco | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

The following table gives the rates per 100,000 population for 98 cities for the 5-week period ended February 23, 1929, compared with those for a like period ended February 25, 1928. The population figures used in computing the rates are approximate estimates, authoritative figures for many of the cities not being available. The 98 cities reporting cases had estimated aggregate populations of more than 31,000,000. The 91 cities reporting deaths had nearly 30,000,000 estimated population. 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, January 20 to February 23, 1929—Annual rates per 100,000 population compared with rates for the corresponding period of 1928* [1]

DIPHTHERIA CASE RATES

| | Week ended— | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Jan. 26, 1929 | Jan. 28, 1928 | Feb. 2, 1929 | Feb. 4, 1928 | Feb. 9, 1929 | Feb. 11, 1928 | Feb. 16, 1929 | Feb. 18, 1928 | Feb. 23, 1929 | Feb. 25, 1928 |
| 98 cities | 125 | 194 | 110 | 194 | 118 | 170 | [2] 122 | 177 | [3] 118 | 177 |
| New England | 201 | 172 | 109 | 193 | 118 | 136 | 131 | 172 | [3] 115 | 138 |
| Middle Atlantic | 136 | 252 | 133 | 279 | 141 | 231 | 147 | 235 | 139 | 224 |
| East North Central | 122 | 186 | 106 | 145 | 113 | 174 | [2] 114 | 169 | 106 | 169 |
| West North Central | 115 | 131 | 90 | 113 | 146 | 100 | 150 | 125 | 131 | 125 |
| South Atlantic | 79 | 149 | 107 | 180 | 67 | 121 | 73 | 155 | 67 | 168 |
| East South Central | 136 | 84 | 68 | 77 | 81 | 63 | 81 | 63 | 68 | 35 |
| West South Central | 119 | 166 | 99 | 154 | 119 | 130 | 119 | 126 | 182 | 191 |
| Mountain | 52 | 124 | 70 | 106 | 78 | 44 | 44 | 186 | 44 | 71 |
| Pacific | 95 | 161 | 67 | 156 | 70 | 133 | 80 | 82 | 110 | 161 |

[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, 1929 and 1928, respectively.
[2] Fort Wayne, Ind., not included.
[3] Pawtucket, R. I., not included.

*Summary of weekly reports from cities, January 20 to February 23, 1929—Annual rates per 100,000 population compared with rates for the corresponding period of 1928*—Continued

MEASLES CASE RATES

| | Week ended— | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Jan. 26, 1929 | Jan. 28, 1928 | Feb. 2, 1929 | Feb. 4, 1928 | Feb. 9, 1929 | Feb. 11, 1928 | Feb. 16, 1929 | Feb. 18, 1928 | Feb. 23, 1929 | Feb. 25, 1928 |
| 98 cities | 262 | 571 | 275 | 718 | 418 | 790 | [2] 407 | 885 | [2] 458 | 993 |
| New England | 672 | 1,078 | 518 | 1,508 | 566 | 1,614 | 545 | 1,658 | [2] 386 | 1,908 |
| Middle Atlantic | 86 | 484 | 93 | 620 | 129 | 649 | 114 | 702 | 140 | 880 |
| East North Central | 380 | 368 | 417 | 358 | 703 | 440 | [2] 768 | 530 | 882 | 564 |
| West North Central | 627 | 139 | 769 | 223 | 1,192 | 217 | 982 | 241 | 1,252 | 256 |
| South Atlantic | 84 | 1,469 | 103 | 1,823 | 133 | 2,034 | 135 | 2,275 | 167 | 2,489 |
| East South Central | 27 | 1,564 | 7 | 1,459 | 14 | 1,312 | 41 | 1,543 | 0 | 1,171 |
| West South Central | 36 | 507 | 36 | 928 | 36 | 1,321 | 51 | 1,925 | 83 | 1,986 |
| Mountain | 871 | 89 | 697 | 115 | 1,341 | 186 | 1,019 | 97 | 923 | 168 |
| Pacific | 77 | 435 | 102 | 709 | 140 | 719 | 170 | 693 | 150 | 750 |

SCARLET FEVER CASE RATES

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 98 cities | 230 | 278 | 233 | 270 | 247 | 300 | [2] 278 | 290 | [2] 261 | 291 |
| New England | 319 | 372 | 305 | 359 | 308 | 432 | 376 | 441 | [2] 285 | 414 |
| Middle Atlantic | 217 | 289 | 190 | 296 | 186 | 334 | 222 | 331 | 202 | 336 |
| East North Central | 262 | 301 | 280 | 289 | 318 | 310 | [2] 342 | 280 | 340 | 285 |
| West North Central | 296 | 274 | 306 | 248 | 311 | 291 | 366 | 266 | 373 | 276 |
| South Atlantic | 114 | 191 | 131 | 201 | 146 | 224 | 157 | 222 | 144 | 243 |
| East South Central | 231 | 112 | 156 | 70 | 244 | 77 | 258 | 98 | 183 | 98 |
| West South Central | 103 | 130 | 150 | 134 | 241 | 101 | 265 | 118 | 281 | 122 |
| Mountain | 104 | 301 | 61 | 381 | 113 | 540 | 87 | 346 | 113 | 204 |
| Pacific | 267 | 297 | 362 | 217 | 314 | 192 | 339 | 230 | 302 | 233 |

SMALLPOX CASE RATES

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 98 cities | 8 | 23 | 7 | 21 | 5 | 22 | [2] 8 | 20 | [2] 12 | 25 |
| New England | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | [2] 0 | 0 |
| Middle Atlantic | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| East North Central | 8 | 12 | 10 | 9 | 8 | 14 | [2] 15 | 12 | 15 | 13 |
| West North Central | 2 | 121 | 8 | 117 | 2 | 110 | 0 | 102 | 15 | 92 |
| South Atlantic | 7 | 15 | 11 | 19 | 0 | 23 | 2 | 27 | 4 | 29 |
| East South Central | 14 | 28 | 7 | 28 | 0 | 21 | 0 | 35 | 0 | 56 |
| West South Central | 47 | 20 | 28 | 12 | 51 | 16 | 24 | 20 | 99 | 8 |
| Mountain | 61 | 133 | 78 | 115 | 26 | 44 | 70 | 168 | 35 | 62 |
| Pacific | 20 | 59 | 7 | 59 | 7 | 69 | 25 | 18 | 20 | 125 |

TYPHOID FEVER CASE RATES

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 98 cities | 4 | 8 | 4 | 7 | 5 | 7 | [2] 5 | 5 | [2] 4 | 5 |
| New England | 2 | 21 | 2 | 14 | 2 | 9 | 5 | 5 | [2] 9 | 7 |
| Middle Atlantic | 2 | 5 | 4 | 5 | 4 | 6 | 4 | 3 | 4 | 5 |
| East North Central | 4 | 5 | 1 | 3 | 3 | 6 | [2] 2 | 3 | 2 | 1 |
| West North Central | 4 | 8 | 6 | 2 | 2 | 6 | 12 | 4 | 6 | 4 |
| South Atlantic | 2 | 8 | 7 | 6 | 6 | 10 | 6 | 8 | 4 | 10 |
| East South Central | 7 | 28 | 0 | 21 | 7 | 7 | 14 | 14 | 7 | 28 |
| West South Central | 24 | 41 | 8 | 41 | 28 | 41 | 12 | 12 | 8 | 16 |
| Mountain | 0 | 0 | 0 | 9 | 9 | 0 | 0 | 0 | 0 | 0 |
| Pacific | 10 | 0 | 7 | 10 | 7 | 0 | 7 | 8 | 5 | 5 |

[1] Fort Wayne, Ind., not included. [2] Pawtucket, R. I., not included.

*Summary of weekly reports from cities, January 20 to February 23, 1929—Annual rates per 100,000 population compared with rates for the corresponding period of 1928*—Continued

INFLUENZA DEATH RATES

| | Week ended— | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Jan. 26, 1929 | Jan. 28, 1928 | Feb. 2, 1929 | Feb. 4, 1928 | Feb. 9, 1929 | Feb. 11, 1928 | Feb. 16, 1929 | Feb. 18, 1928 | Feb. 23, 1929 | Feb. 25, 1928 |
| 91 cities | 131 | 20 | 85 | 20 | 58 | 18 | [2] 54 | 23 | [3] 45 | 22 |
| New England | 206 | 7 | 143 | 9 | 90 | 7 | 57 | 11 | [3] 42 | 7 |
| Middle Atlantic | 134 | 16 | 82 | 14 | 58 | 15 | 44 | 18 | 35 | 24 |
| East North Central | 70 | 12 | 48 | 13 | 28 | 10 | [3] 37 | 12 | 33 | 14 |
| West North Central | 69 | 15 | 57 | 15 | 51 | 6 | 33 | 9 | 45 | 3 |
| South Atlantic | 182 | 11 | 114 | 25 | 92 | 31 | 60 | 38 | 69 | 31 |
| East South Central | 615 | 100 | 296 | 100 | 126 | 54 | 222 | 54 | 81 | 46 |
| West South Central | 207 | 79 | 174 | 46 | 106 | 58 | 158 | 92 | 138 | 75 |
| Mountain | 70 | 80 | 35 | 53 | 78 | 53 | 87 | 71 | 78 | 35 |
| Pacific | 46 | 20 | 43 | 34 | 43 | 20 | 43 | 27 | 39 | 20 |

PNEUMONIA DEATH RATES

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 91 cities | 328 | 164 | 274 | 155 | 231 | 172 | [2] 223 | 177 | [3] 194 | 166 |
| New England | 468 | 126 | 511 | 126 | 387 | 149 | 305 | 170 | [3] 241 | 147 |
| Middle Atlantic | 454 | 183 | 360 | 178 | 298 | 201 | 254 | 196 | 192 | 156 |
| East North Central | 184 | 121 | 170 | 129 | 133 | 114 | [3] 185 | 137 | 170 | 156 |
| West North Central | 189 | 147 | 189 | 73 | 186 | 159 | 180 | 141 | 207 | 107 |
| South Atlantic | 388 | 214 | 268 | 207 | 240 | 230 | 243 | 216 | 238 | 231 |
| East South Central | 355 | 169 | 207 | 146 | 193 | 222 | 163 | 192 | 155 | 222 |
| West South Central | 308 | 271 | 199 | 212 | 199 | 204 | 219 | 283 | 260 | 275 |
| Mountain | 157 | 177 | 148 | 204 | 235 | 151 | 244 | 168 | 226 | 248 |
| Pacific | 128 | 145 | 118 | 128 | 134 | 182 | 128 | 172 | 134 | 115 |

[2] Fort Wayne, Ind., not included. [3] Pawtucket, R. I., not included.

*Number of cities included in summary of weekly reports, and aggregate population of cities of each group, approximated as of July 1, 1929 and 1928, 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 | |
|---|---|---|---|---|---|---|
| | | | 1929 | 1928 | 1929 | 1928 |
| Total | 98 | 91 | 31,568,400 | 31,052,700 | 29,995,100 | 29,498,600 |
| New England | 12 | 12 | 2,305,100 | 2,273,900 | 2,305,100 | 2,273,900 |
| Middle Atlantic | 10 | 10 | 10,809,700 | 10,702,200 | 10,809,700 | 10,702,200 |
| East North Central | 16 | 16 | 8,181,900 | 8,001,300 | 8,181,900 | 8,001,300 |
| West North Central | 12 | 9 | 2,712,100 | 2,673,300 | 1,736,900 | 1,708,100 |
| South Atlantic | 19 | 19 | 2,783,200 | 2,732,900 | 2,783,200 | 2,732,900 |
| East South Central | 6 | 5 | 767,900 | 745,500 | 704,200 | 682,400 |
| West South Central | 8 | 7 | 1,319,100 | 1,289,900 | 1,285,000 | 1,256,400 |
| Mountain | 9 | 9 | 598,800 | 590,200 | 598,800 | 590,200 |
| Pacific | 6 | 4 | 2,090,600 | 2,043,500 | 1,590,300 | 1,551,200 |

# FOREIGN AND INSULAR

## CANADA

*Provinces—Communicable diseases—Week ended February 16, 1929.*—The Department of Pensions and National Health reports cases of certain communicable diseases from eight Provinces of Canada for the week ended February 16, 1929, as follows:

| Disease | Nova Scotia | New Brunswick | Quebec | Ontario | Manitoba | Saskatchewan | Alberta | British Columbia | Total |
|---|---|---|---|---|---|---|---|---|---|
| Cerebrospinal fever | | | | 2 | | | | 1 | 3 |
| Influenza | 17 | | 18 | 203 | 3 | 1 | | 15 | 257 |
| Lethargic encephalitis | | | | | | | | 1 | 1 |
| Smallpox | | | | 38 | 2 | 13 | | 24 | 77 |
| Typhoid fever | | | 5 | 57 | 1 | | 4 | | 67 |

*Quebec Province—Vital statistics—Comparative—Year 1928, and December, 1928.*—Births, deaths, and marriages for the month of December, 1928, with the deaths from certain diseases for that month and the year 1928, compared with 1927 and 1926, are shown in the tables below.

| *December, 1928* | |
|---|---|
| Estimated population | 2,650,400 |
| Births | 6,315 |
| Birth rate per 1,000 population | 28.1 |
| Deaths | 3,948 |
| Death rate per 1,000 population | 17.6 |
| Deaths under 1 year | 845 |
| Infant mortality rate | 133.8 |
| Deaths from: | |
| Cancer | 171 |
| Cerebrospinal meningitis | 5 |
| Diabetes | 22 |
| Diarrhea | 79 |
| Diphtheria | 74 |
| Heart disease | 414 |

| *December, 1928*—Continued | |
|---|---|
| Deaths from—Continued. | |
| Influenza | 601 |
| Measles | 5 |
| Pneumonia | 538 |
| Poliomyelitis | 1 |
| Scarlet fever | 19 |
| Smallpox | 2 |
| Syphilis | 4 |
| Tuberculosis (pulmonary) | 202 |
| Tuberculosis (all other forms) | 43 |
| Typhoid fever | 23 |
| Violence | 70 |
| Whooping cough | 13 |

| | 1928 | | 1927 | | 1926 | |
|---|---|---|---|---|---|---|
| | Number | Per 1,000 population | Number | Per 1,000 population | Number | Per 1,000 population |
| Live births | 83,331 | 31.5 | 83,064 | 31.9 | 82,165 | 32.1 |
| Marriages | 19,145 | 7.2 | 18,551 | 7.1 | 17,827 | 7.0 |
| Deaths, all ages | 36,740 | 13.9 | 36,175 | 13.9 | 37,251 | 14.5 |
| Deaths under 1 year | 10,250 | | 10,739 | | 11,666 | |
| Deaths from: | | | | | | |
| Influenza— | | | | | | |
| December only | 601 | 268.1 | 77 | 34.8 | 128 | 58.8 |
| Year | 1,478 | 56.8 | 1,037 | 39.8 | 2,085 | 81.3 |
| Pneumonia and broncho-pneumonia— | | | | | | |
| December only | 538 | 240.0 | 235 | 106.2 | 290 | 132.3 |
| Year | 3,095 | 118.9 | 2,410 | 92.5 | 2,643 | 103.2 |
| Tuberculosis (pulmonary)— | | | | | | |
| December only | 202 | 89.7 | 197 | 89.0 | 204 | 93.7 |
| Year | 2,346 | 90.1 | 2,607 | 100.1 | 2,699 | 105.3 |

The deaths of infants under 1 year per 1,000 live births were: 1928, 123.0; 1927, 129.3; 1926, 142.0.

## CZECHOSLOVAKIA

*Communicable diseases—November, December, 1928.*—During the months of November and December, 1928, communicable diseases were reported in Czechoslovakia as follows:

| Disease | November | | December | |
|---|---|---|---|---|
| | Cases | Deaths | Cases | Deaths |
| Anthrax | 7 | 1 | 3 | ---- |
| Cerebrospinal meningitis | 8 | 4 | 15 | 4 |
| Diphtheria | 1,992 | 131 | 1,923 | 136 |
| Dysentery | 26 | ---- | 20 | ---- |
| Malaria | 8 | ---- | 6 | ---- |
| Paratyphoid fever | 20 | ---- | 17 | 1 |
| Puerperal fever | 55 | 15 | 69 | 26 |
| Scarlet fever | 3,206 | 44 | 2,731 | 65 |
| Trachoma | 211 | ---- | 185 | ---- |
| Typhoid fever | 758 | 51 | 615 | 43 |

## YUGOSLAVIA

*Communicable diseases—January, 1929.*—During the month of January, 1929, communicable diseases were reported from Yugoslavia as follows:

| Disease | Cases | Deaths | Disease | Cases | Deaths |
|---|---|---|---|---|---|
| Anthrax | 43 | 10 | Measles | 2,089 | 54 |
| Cerebrospinal meningitis | 11 | 9 | Scarlet fever | 2,275 | 423 |
| Diphtheria | 351 | 57 | Tetanus | 9 | 4 |
| Dysentery | 10 | ---- | Typhoid fever | 231 | 43 |
| Glanders | 1 | 1 | Typhus fever | 15 | 3 |

## 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 | | Aug. 26–Sept. 22, 1928 | Sept. 23–Oct. 20, 1928 | Oct. 21–Nov. 17, 1928 | Week ended— Nov. 24, 1928 | December, 1928 1 | 8 | 15 | 22 | 29 | January, 1929 5 | 12 | 19 | 26 | February, 1929 2 | 9 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ceylon | C | | | | | | | | | 5 | 2 | | | | | | |
| | D | | | | | | | | | 2 | 2 | | | | | | |
| Colombo | C | | | | | | | | | | | 3 | 1 | 1 | | | |
| | D | | | | | | | | | | | 1 | | | | | |
| Ingiriya Province | C | | | 1 | | | | | | | | | | | | | |
| | D | | | 1 | | | | | | | | | | | | | |
| China: | | | | | | | | | | | | | | | | | |
| Canton | C | 1 | | 2 | | | | | 2 | | | 1 | | | | | |
| | D | 1 | | | | | | | 1 | | | | | | | | |
| Kwantung—Dairen | C | 3 | | | | | | | | | | | | | | | |
| | D | 1 | | | | | | | | | | | | | | | |
| Shanghai | C | 2 | | | | | | | | | | | | | | | |
| | D | 3 | 3 | | | | | | | | | | | | | | |
| India | C | 32,287 | 17,028 | 20,937 | 5,581 | 6,932 | 5,661 | 5,354 | 4,602 | 4,507 | | | | | | | |
| | D | 17,731 | 10,187 | 12,490 | 3,369 | 4,505 | 3,706 | 3,370 | 2,839 | 2,673 | | | | | | | |
| Bassein | D | | | | | | | | | | | | 1 | 4 | 1 | | |
| Bombay | C | 6 | 15 | 1 | 3 | | 1 | | | | | | 1 | | | | |
| | D | 4 | 7 | 1 | 3 | | 1 | | | | | | | | | | |
| Calcutta | C | 68 | 41 | 219 | 87 | 61 | 52 | 47 | 28 | 12 | 33 | 30 | 23 | | | | |
| | D | 40 | 39 | 140 | 53 | 39 | 36 | 27 | 15 | 13 | 13 | 20 | 13 | 30 | 19 | 23 | |
| Madras | C | 149 | 97 | 203 | 32 | 32 | 11 | 28 | 6 | | 6 | 4 | 1 | | 1 | | |
| | D | 88 | 73 | 115 | 15 | 15 | 6 | 6 | 4 | 2 | 8 | 3 | | 1 | 4 | | |
| Madras Presidency | C | | | | | | 1 | | | | | | | | | | |
| | D | | | | | | 1 | | | | | | | | | | |
| Moulmein | D | | | | | | 1 | | | | | | | | | | |
| Negapatam | C | 1 | | | | | 1 | | | 3 | 1 | 2 | 8 | 9 | | 1 | |
| | D | 7 | 1 | | 1 | | | | | | | | | | | | |
| Rangoon | C | 2 | 1 | | 4 | 1 | | | | | | 6 | | | | | |
| | D | 2 | 2 | | 3 | 2 | | | | | 1 | 4 | 1 | 3 | 1 | 4 | |
| Tuticorin | C | 1 | 1 | | | 1 | 1 | | 33 | 39 | 27 | 16 | 31 | 31 | 7 | 16 | |
| | D | | | 1 | | | | | 19 | 18 | 15 | 9 | 15 | 21 | 5 | 11 | |
| Vizagapatam | D | 5 | | | | | | | | | | | | | | | |
| India (French): | | | | | | | | | | | | | | | | | |
| Chandernagor | C | 3 | 16 | 43 | 18 | 4 | 3 | | 2 | 1 | | 1 | | | | | |
| | D | 2 | 7 | 34 | 6 | 3 | 1 | | 2 | 1 | | 1 | | | | | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Karikal | C | 41 | 9 | 111 | 6 | ------ | 1 | ------ | 4 | 9 | 20 | 21 | 40 | 61 | ------ | ------ | ------ | | |
| | D | 26 | 8 | 85 | 3 | ------ | 1 | ------ | 4 | 8 | 13 | 16 | 34 | 46 | ------ | ------ | ------ | | |
| Pondicherry Province | C | 132 | 31 | 6 | 13 | 16 | 8 | ------ | 5 | 25 | 37 | 25 | 27 | 58 | ------ | ------ | ------ | | |
| | D | 72 | 19 | 5 | 9 | 11 | 7 | 3 | 3 | 12 | 21 | 19 | 22 | 45 | ------ | ------ | ------ | | |
| Indo-China (see also table below): | | | | | | | | | | | | | | | | | | | |
| Pnompenh | C | 3 | ------ | 1 | ------ | ------ | ------ | 1 | ------ | 1 | 3 | 2 | 1 | ------ | 1 | ------ | ------ | | |
| | D | 2 | ------ | 1 | ------ | ------ | ------ | 1 | ------ | 1 | ------ | ------ | ------ | ------ | 1 | ------ | ------ | | |
| Saigon | C | 2 | ------ | 1 | ------ | ------ | ------ | ------ | ------ | 3 | 1 | 2 | 3 | 1 | 2 | ------ | ------ | | |
| | D | 1 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 1 | 1 | 2 | 1 | 1 | 1 | ------ | ------ | | |
| Japan: Osaka | C | ------ | 1 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | | |
| Kwangchow-Wan (see table below). | | | | | | | | | | | | | | | | | | | |
| Siam | C | 21 | 14 | 47 | 26 | 20 | 29 | 29 | 35 | 45 | 84 | 60 | 59 | 72 | 29 | 35 | ------ | | |
| | D | 14 | 10 | 27 | 15 | 11 | 17 | 25 | 13 | 33 | 53 | 51 | 50 | 38 | 23 | 27 | ------ | | |
| Anthoang | C | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 4 | ------ | ------ | ------ | 1 | ------ | ------ | ------ | ------ | | |
| | D | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 1 | ------ | ------ | ------ | 1 | ------ | ------ | ------ | ------ | | |
| Ayudhaya | C | 1 | 7 | 15 | ------ | 2 | ------ | ------ | 1 | 2 | 8 | 5 | 1 | ------ | 2 | 1 | ------ | | |
| | D | 1 | 6 | 12 | ------ | 2 | ------ | ------ | 1 | 1 | 6 | 6 | 1 | ------ | 2 | 1 | ------ | | |
| Bangkok | C | 5 | 4 | 5 | 8 | 4 | 2 | 4 | 9 | 8 | 2 | 3 | 11 | 14 | 12 | 17 | 3 | | |
| | D | 1 | 1 | 3 | 7 | 1 | ------ | 4 | 3 | 1 | 2 | ------ | 18 | 8 | 8 | 9 | 1 | | |
| Chaxoengsao | C | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 1 | ------ | 3 | 5 | ------ | | |
| | D | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 1 | ------ | 3 | 5 | ------ | | |
| Dhannapuri | C | 3 | ------ | ------ | ------ | ------ | 2 | 4 | 2 | 3 | 9 | 2 | 2 | ------ | ------ | ------ | ------ | | |
| | D | 3 | ------ | ------ | ------ | ------ | 1 | 4 | 1 | 2 | 7 | ------ | 2 | ------ | ------ | ------ | ------ | | |
| Lobpuri | C | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 26 | 27 | 21 | ------ | ------ | ------ | ------ | | |
| | D | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 23 | 18 | 20 | ------ | ------ | ------ | ------ | | |
| Nondpuri | C | ------ | ------ | ------ | ------ | ------ | ------ | 1 | ------ | 4 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | | |
| | D | ------ | ------ | ------ | ------ | ------ | ------ | 1 | ------ | 2 | ------ | ------ | ------ | ------ | ------ | 1 | ------ | | |
| Pradhumdham | C | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 1 | ------ | | |
| | D | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 1 | ------ | | |
| Singhapuri | C | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 17 | 2 | ------ | 3 | 1 | ------ | | |
| | D | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 12 | 2 | ------ | 4 | 1 | ------ | | |
| Smud Prakar | C | ------ | ------ | ------ | ------ | ------ | 23 | 14 | 19 | 6 | 3 | 2 | 6 | ------ | 2 | 2 | ------ | | |
| | D | ------ | ------ | ------ | ------ | ------ | 15 | 13 | 4 | 5 | 1 | ------ | 5 | ------ | 2 | 1 | ------ | | |
| Smud Sagara | C | ------ | ------ | 27 | 16 | 12 | 3 | 3 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | | |
| | D | ------ | ------ | 12 | 6 | 6 | 1 | 3 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | | |
| On vessel: S. S. Glenapp, at Yokohama, from Shanghai | C | P | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | | |

| Place | | August, 1928 | September, 1928 | October, 1928 | | | November, 1928 | | | December, 1928 | | | January, 1929 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 1-10 | 11-20 | 21-31 | 1-10 | 11-20 | 21-30 | 1-10 | 11-20 | 21-31 | 1-10 | 11-20 | 21-31 |
| Indo-China (French) (see also table above): | | | | | | | | | | | | | | | |
| Annan | C | 11 | 4 | 4 | 5 | 2 | ------ | ------ | 5 | ------ | ------ | ------ | ------ | ------ | ------ |
| Cambodia | C | 38 | 16 | 6 | 19 | ------ | ------ | 4 | 17 | ------ | 21 | 4 | 26 | 25 | 28 |
| Cochin-China | C | 28 | 28 | 6 | 26 | 20 | 27 | 48 | 81 | ------ | 351 | 346 | 232 | 202 | 226 |
| Tonkin | C | 2 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Kwangchow-Wan | C | 1 | ------ | ------ | ------ | ------ | ------ | 1 | ------ | ------ | ------ | ------ | ------ | ------ | ------ |

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

### PLAGUE

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

| Place | | Aug. 26–Sept. 22, 1928 | Sept. 23–Oct. 20, 1928 | Oct. 21–Nov. 17, 1928 | Week ended— Nov. 24, 1928 | December, 1928 | | | | | January, 1929 | | | | February, 1929 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 8 | 15 | 22 | 29 | 5 | 12 | 19 | 26 | 2 | 9 | 16 | 23 |
| Algeria: | | | | | | | | | | | | | | | | | | |
| Algiers | C | | | 2 | | | | | | | | | | | | | | |
| Oran | C | | 1 | 2 | | | | | | | | | | | | | | |
| Phillippeville | C | | 2 | | | | | | | | | | | | | | | |
| Argentina: [1] | | | | | | | | | | | | | | | | | | |
| Buenos Aires [2] | | | | | | | | | | | | | | | | | | |
| Catamarca Province: Recreo | C | | | P | | | 9 | | | | | | | | | | | |
| Cordoba Province— | | | | | | | | | | | | | | | | | | |
| Canada Honda | C | | | 14 | | | | | | | | | | | | | | |
| Laborde | C | | | | | | | | | | 1 | | | | | | | |
| Jujuy Province: Perico | C | | | | | | | | | | 1 | | | | | 3 | | |
| Rosario | C | | | | | | | | | 1 | 1 | | | | | 1 | | |
| Santiago del Estero | C | | | 7 | | | | | | | | | | | | | | |
| Tucuman Province: El Mollar | C | | | | | | 5 | | | | | | | | | | | |
| Azores: St. Michaels Island | C | 2 | 3 | 3 | | | | | | | | | | | | | | |
| | D | | | 1 | | | | | | | | | | | | | | |
| Belgian Congo: | | | | | | | | | | | | | | | | | | |
| Djugu | C | | | 2 | | | | | | | | | | | | | | |
| Lenza | C | | | 1 | 1 | | | | | 1 | | | | | | | | |
| Brazil: Santos | C | | | | 2 | | | | | | | | | | | | | |
| British East Africa (see also table below): | | | | | | | | | | | | | | | | | | |
| Mombasa | C | 1 | 3 | | | | | | | | | | | | | | | |
| | D | 1 | 3 | | | | | | | | | | | | | | | |
| Plague-infected rats | | | 2 | | | | | | | | | | | | | | | |
| Tanganyika | C | 8 | | | | | | | | | | | | | | | | |
| | D | 8 | | | | | | | | | | | | | | | | |
| Uganda | C | 102 | 106 | 114 | 33 | | 51 | 40 | 36 | 21 | 51 | | | | | | | |
| | D | 64 | 86 | 103 | 33 | | 50 | 38 | 35 | 21 | 51 | | | | | | | |
| Canary Islands: | | | | | | | | | | | | | | | | | | |
| Las Palmas | C | 2 | 2 | | | | | | | | | | | | | | | |
| | D | 1 | 1 | | | | | | | | | | | | | | | |
| Teneriffe | C | 5 | 2 | | | | 1 | | | | | | | | | | | |
| | D | 3 | | | | | | | | | | | | | | | | |
| Laguna | C | | 4 | | | | | | | | | | | | | 1 | | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ceylon:** | | | | | | | | | | | | | | | | | | | |
| **Colombo** | C | 3 | 2 | 1 | | 1 | 1 | 2 | 2 | 1 | 2 | 3 | | 1 | 2 | 3 | | | |
| | D | 3 | 1 | 1 | | 1 | 1 | 2 | 2 | 1 | 2 | 3 | | 2 | 1 | 2 | | | |
| **Plague-infected rats** | | | 1 | | 3 | | 2 | | | | | | | | | 2 | | | |
| **Jaffna** | C | | 2 | 1 | | | | | | | | | | | | | | | |
| | D | | 2 | | | | | | | | | | | | | | | | |
| **China:** | | | | | | | | | | | | | | | | | | | |
| **Hainan** | C | | | | | | | | | | | | | | | | P | | |
| **Mongolia—** | | | | | | | | | | | | | | | | | | | |
| **Chien Chia Tien** | C | P | P | | | | | | | | | | | | | | | | |
| **Tungliao** | C | 220 | 173 | 19 | | | | | | | | | | | | | | | |
| **Urga** | C | P | | | | | | | | | | | | | | | | | |
| **Shansi—Fengchow** | C | | P | | | | | | | | | | | | | | | | |
| **Suyuan Province** | C | | | | | | | | | | | | | | | P | | | |
| **Dutch East Indies:** | | | | | | | | | | | | | | | | | | | |
| **Celebes—Makassar** | C | | 1 | | | | | | | | | | | | | | | | |
| | D | | 1 | | | | | | | | | 1 | | | | | | | |
| **Plague-infected rats** | | | 4 | 2 | | | | | | | | | | | | 1 | | | |
| **Java—** | | | | | | | | | | | | | | | | | | | |
| **Batavia and West Java** | C | 49 | 29 | 23 | 13 | 10 | 10 | 10 | 9 | 18 | 13 | 14 | | | | 1 | | | |
| | D | 49 | 29 | 22 | 13 | 10 | 9 | 10 | 9 | 18 | 12 | 14 | | | | | | | |
| **Plague-infected rats** | | | | | | | 1 | | | | | | | | | | | | |
| **East Java and Madura** | C | 1 | 16 | | | | | | | | | | | | | | | | |
| | D | 1 | 16 | | | | | | | | | | | | | | | | |
| **Surabaya Residency** | C | | 1 | 2 | | | 1 | | | | | | | | | | | | |
| | D | | 1 | 2 | | | | | | | | | | | | | | | |
| **Ecuador** (see table below). | | | | | | | | | | | | | | | | | | | |
| **Egypt:** | | | | | | | | | | | | | | | | | | | |
| **Alexandria** | C | 2 | | | | | | | | | | | | 2 | | | | | |
| | D | 1 | | | | | | | | | | | | 1 | | | | | |
| **Amrieh District** | C | 11 | 1 | | | | | | | | | | | | | | | | |
| | D | 5 | 1 | | | | | | | | | | | | | | | | |
| **Assiout Province** | C | 1 | 1 | 3 | | | | | | | | | | | | | | | |
| | D | 1 | 1 | 3 | | | | | | | | | | | | | | | |
| **Beheira Province** | C | 5 | 1 | | | | | | | | | | | | | | | | |
| | D | 2 | 1 | | | | | | | | | | | | | | | | |
| **Beni-Suef** | C | 16 | | | | 4 | | | | 4 | 2 | 3 | 1 | 2 | | | | | |
| | D | 5 | | | | 1 | | | | 1 | 1 | | | 3 | | | | | |
| **Dierout** | C | | | 1 | | | | | | | | | | | | | | | |
| | D | | | 1 | | | | | | | | | | | | | | | |
| **Girga** | C | 5 | | | 1 | | | | | | | | | | | | | | |
| | D | 4 | | | 1 | | | | | | | | | | | | | | |
| **Kena Province** | C | | | | 3 | 1 | | | | | | | | | | | | | |
| | D | | | | 2 | 1 | | | | | | | | | | | | | |
| **Menoufieh Province** | C | | | 7 | | | | | | | | | | | | | | | |
| **Tanta** | C | | | 5 | | | | | | | | | | | | | | | |

[1] During the period from Nov. 10 to Dec. 11, 1928, 13 cases of plague were reported at El Mollar, Tucuman Province, Argentina. During the same period 1 case of plague was reported at Chipion and 1 at Ucacha, both in Cordoba Province, Argentina.

[2] 18 plague-infected rats were reported at Buenos Aires, Argentina, from July 1 to Dec. 31, 1928.

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

### PLAGUE—Continued

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

| Place | | Aug. 26–Sept. 22, 1928 | Sept. 23–Oct. 20, 1928 | Oct. 21–Nov. 17, 1928 | Week ended— Nov. 24, 1928 | December, 1928 | | | | | January, 1929 | | | | February, 1929 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 8 | 15 | 22 | 29 | 5 | 12 | 19 | 26 | 2 | 9 | 16 | 23 |
| Greece (see also table below): | | | | | | | | | | | | | | | | | | |
| Athens and Piræus | C | 2 | 5 | 5 | | | | | | | | | | | | | | |
| Corfu | C | 1 | | | 1 | | | | | | | | | | | | | |
| Patras | C | 1 | | | | | | | | | | | | | | | | |
| Hawaii Territory—Hawaii: | | | | | | | | | | | | | | | | | | |
| Hamakua District—Honokaa | D | 2 | | | | | | | | | | | | | | | | |
| Plague-infected rats | | 4 | | | | | | | | | | | | | | | | |
| India | C | 3,354 | 6,209 | 8,710 | 1,930 | 1,953 | 1,816 | 2,068 | 1,750 | 1,239 | | | | | | | | |
| | D | 1,573 | 3,225 | 4,428 | 1,067 | 1,208 | 1,205 | 1,383 | 1,194 | 771 | | | | | | | | |
| Bassein | D | 1 | | 2 | | | | | | | | 1 | 1 | | 3 | | | |
| Bombay | C | 7 | 4 | 5 | | 4 | | | | | | | 1 | | | | | |
| | D | 6 | 5 | 2 | | 5 | | 1 | | | | | 1 | | 2 | | | |
| Plague-infected rats | | 20 | 13 | 7 | 10 | 10 | 8 | 4 | 7 | 5 | 14 | 9 | 11 | 10 | 11 | 6 | | |
| Calcutta | D | 1 | | | | | | | | | | | | | | | | |
| Cochin | D | | | | | | | | | | 10 | | | | | | | |
| Madras Presidency | C | 317 | 196 | 539 | 211 | 149 | 197 | 129 | 136 | 111 | 152 | 101 | | | | | | |
| | D | 147 | 97 | 235 | 71 | 69 | 108 | 59 | 69 | 41 | 73 | 48 | | | | | | |
| Rangoon | C | 17 | 7 | 2 | | | | 1 | | | | | | | | | | |
| | D | 15 | 5 | 3 | | | 1 | | 1 | | | | 1 | 1 | 2 | 1 | | |
| Plague-infected rats | | 2 | | 4 | | | | | | | | | | | | 5 | | |
| Indo-China (see also table below): | | | | | | | | | | | | | | | | | | |
| Pnompenh | C | 6 | 1 | 1 | | 2 | 1 | 1 | | 2 | 2 | 4 | 2 | 4 | 1 | 3 | | |
| | D | 4 | 1 | 1 | | 2 | 1 | 1 | | 1 | 2 | 3 | 2 | 4 | 1 | 2 | | |
| Saigon | C | | | 1 | | | | | | | | | | | | | | 1 |
| Tourane | C | | | | | | | | | | | | | | | | 5 | |
| Iraq: | | | | | | | | | | | | | | | | | | |
| Baghdad | C | 4 | | 9 | 3 | 2 | 4 | 1 | 1 | 2 | 5 | 1 | 2 | 1 | 3 | | | 1 |
| | D | 2 | | 5 | 2 | 1 | 2 | | 1 | 2 | 5 | | | 1 | 2 | | | |
| Plague-infected rats | | | | | | | | | | | | | | | 1 | 5 | | 6 |
| Naudham | C | | | | | | | | | | | | 2 | | | | | |
| | D | | | | | | | | | | | | 1 | | | | | |
| Plague-infected rats | | | | | | | | | | | | | | | | 1 | | |
| Madagascar (see also table below): | | | | | | | | | | | | | | | | | | |
| Tamatave | C | 9 | 13 | 7 | | | | | 2 | | | | 1 | | | | | |
| | D | 4 | 10 | 3 | 1 | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nigeria: | | | | | | | | | | | | | | | | | | |
| Lagos | C | 60 | 88 | 83 | 15 | 9 | 11 | 8 | 5 | 4 | 2 | 1 | 1 | 4 | 2 | | | |
| | D | 59 | 88 | 77 | 14 | 9 | 10 | 8 | 5 | 3 | 2 | 1 | 1 | 3 | 1 | | | |
| Plague-infected rats | | 62 | 91 | 145 | | 30 | | | | 13 | 15 | | | | | | | |
| Paraguay: Asuncion | C | | 3 | | | | | | | | | | | | | | | |
| Peru (see table below). | | | | | | | | | | | | | | | | | | |
| Senegal (see table below). | | | | | | | | | | | | | | | | | | |
| Siam | C | | | 1 | | | | 9 | | | | 4 | | | 6 | 1 | | |
| | D | | | 1 | | | | 8 | | | | 3 | | | 6 | 1 | | 1 |
| Bangkok | C | | | 1 | | | | | | | 2 | 2 | 1 | | | | | |
| | D | | | 1 | | | | | | | 1 | | 1 | | 1 | | | |
| Panknampo | C | | | | | | | 8 | | | | | | | | | | |
| | D | | | | | | | 7 | | | | | | | | | | |
| Straits Settlements: | | | | | | | | | | | | | | | | | | |
| Ipoh | C | 2 | | | | | | | | | | | | | | | | |
| | D | 2 | | | | | | | | | | | | | | | | |
| Penang | C | | 1 | | | | | | | | | | | | | | | |
| Singapore | C | | | | | | | | | | | | | | | | | 1 |
| | D | | | | | | | | | | | | | | | | | |
| Syria (see table below). | | | | | | | | | | | | | | | | | | |
| Turkey: | | | | | | | | | | | | | | | | | | |
| Adalia | C | | 1 | 1 | | | | | | | | | | | | | | |
| Constantinople | C | | 1 | | | | | | | | | | | | | | | |
| Union of South Africa: | | | | | | | | | | | | | | | | | | |
| Cape Province | C | | | 2 | 1 | | | | | | 2 | 2 | | | | | | |
| Orange Free State | C | | 1 | P | | | | | | | | 1 | | | | | | |
| Transvaal | C | | | | | | | | | | | 3 | | | | | | |
| Union of Socialist Soviet Republics: | | | | | | | | | | | | | | | | | | |
| Astrakan— | | | | | | | | | | | | | | | | | | |
| Kirghiz District | D | 54 | | | | | | | | | | | | | | | | |
| Krasnolarsk District | D | 1 | | | | | | | | | | | | | | | | |
| Chita District | C | 1 | | | | | | | | | | | | | | | | |
| Kalmouks District | C | | | 10 | | | | | | | | | | | | | | |
| | D | | | 7 | | | | | | | | | | | | | | |
| Kasacks | C | | | 7 | | | | | | | | | | | | | | |
| Ural Government | C | | | 7 | | | | | | | | | | | | | | |
| | D | | | 7 | | | | | | | | | | | | | | |
| Uruguay: Rivera | C | | | | | | | | | | | 1 | | | | | | |
| On vessel: | | | | | | | | | | | | | | | | | | |
| S. S. Automedon, at Penang, Straits Settlements | C | | P | | | | | | | | | | | | | | | |
| S. S. Halydan, at Bangkok, from Singapore | C | | | | | | | | | 1 | | | | | | | | |
| S. S. Sjomand, at Alexandria, from Batoum | C | | | | | | | | | | | | | 1 | | | | |

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

### PLAGUE—Continued

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

| Place | | August, 1928 | September, 1928 | October, 1928 | November, 1928 | December, 1928 | January, 1929 |
|---|---|---|---|---|---|---|---|
| British East Africa (see also table above): | | | | | | | |
| Kenya | C | 144 | 15 | 37 | 16 | 15 | ..... |
| | D | 34 | ..... | ..... | 2 | ..... | ..... |
| Uganda | C | 152 | 128 | 134 | ..... | ..... | ..... |
| | D | 141 | 98 | 108 | ..... | ..... | ..... |
| Ecuador: Guayquil | C | ..... | 3 | 3 | 21 | 20 | ..... |
| | D | ..... | ..... | 2 | 8 | 7 | ..... |
| Plague-infected rats | | ..... | 27 | 21 | 29 | 75 | ..... |
| Greece (see also table above) | C | ..... | ..... | ..... | 1 | 2 | 3 |
| | D | ..... | ..... | ..... | 1 | 1 | 1 |
| Indo-China (see also table above) | C | 2 | 6 | 2 | ..... | ..... | 11 |
| Madagascar (see also table above) | C | 65 | 59 | 88 | ..... | 282 | ..... |
| | D | 61 | 51 | 84 | ..... | 116 | ..... |
| Ambositra Province | C | 3 | ..... | 8 | 14 | 30 | ..... |
| | D | 3 | ..... | 8 | 14 | 25 | ..... |
| Antisirabe Province | C | ..... | 10 | 2 | 6 | 3 | ..... |
| | D | ..... | 10 | 2 | 6 | 3 | ..... |
| Itasy Province | C | ..... | 2 | 5 | 6 | 6 | ..... |
| | D | ..... | 2 | 5 | 6 | 6 | ..... |
| Majunga | C | 2 | ..... | ..... | ..... | ..... | ..... |
| | D | 2 | ..... | ..... | ..... | ..... | ..... |
| Moramanga Province | C | 11 | 20 | 38 | 32 | 10 | ..... |
| | D | 10 | 18 | 35 | 32 | 10 | ..... |
| Madagascar—Continued. | | | | | | | |
| Tamatave | C | 12 | 18 | 9 | 2 | 1 | ..... |
| | D | 7 | 10 | 7 | 2 | 1 | ..... |
| Tananarive Province | C | 51 | 75 | 100 | 159 | 75 | ..... |
| | D | 51 | 62 | 95 | 141 | 71 | ..... |
| Peru | C | 4 | 3 | 10 | 18 | 26 | ..... |
| | D | 1 | 1 | 4 | 6 | 6 | ..... |
| Senegal | C | 43 | 199 | ..... | ..... | ..... | ..... |
| | D | 32 | 127 | ..... | ..... | ..... | ..... |
| Baol [1] | C | 68 | 73 | 39 | 18 | 4 | ..... |
| | D | 38 | 40 | 14 | 6 | 2 | ..... |
| Cayor [1] | C | 46 | 20 | 17 | ..... | 14 | ..... |
| | D | 15 | 8 | 6 | ..... | 10 | ..... |
| Fatick [1] | C | ..... | ..... | 35 | ..... | ..... | ..... |
| | D | ..... | ..... | 20 | ..... | ..... | ..... |
| Louga [1] | C | ..... | ..... | 14 | 2 | ..... | ..... |
| | D | ..... | ..... | 5 | 1 | ..... | ..... |
| Rufisque [1] | C | 2 | 1 | 49 | 8 | ..... | ..... |
| | D | ..... | 1 | 14 | 4 | ..... | ..... |
| Thies [1] | C | 151 | 106 | 51 | 11 | ..... | ..... |
| | D | 119 | 78 | 29 | ..... | ..... | ..... |
| Tivaouane [1] | C | 9 | ..... | ..... | ..... | ..... | ..... |
| Syria: Beirut | C | ..... | ..... | 1 | 3 | ..... | ..... |

## SMALLPOX

| Place | | Aug. 26–Sept. 22, 1928 | Sept. 23–Oct. 20, 1928 | Oct. 21–Nov. 17, 1928 | Week ended— Nov. 24, 1928 | December, 1928 | | | | | January, 1929 | | | | February, 1929 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 8 | 15 | 22 | 29 | 5 | 12 | 19 | 26 | 2 | 9 | 16 | 23 |
| Algeria: | | | | | | | | | | | | | | | | | | |
| Algiers | C | 2 | 4 | 2 | | 1 | | | | | | | | | | | | |
| Oran | C | | 21 | | | | 7 | | | | | | | | | | | |
| Arabia: Aden | C | 1 | | 1 | 1 | | | | | | | 1 | 1 | 1 | | | | |
| Brazil (see table below). | | | | | | | | | | | | | | | | | | |
| British East Africa (see also table below), Kenya— | | | | | | | | | | | | | | | | | | |
| Mombasa | C | | 1 | | | | | | 3 | | | | | | | | | |
| British South Africa: | | | | | | | | | | | | | | | | | | |
| Northern Rhodesia | C | 382 | 195 | 342 | | | | 67 | 173 | | | | | | | | | |
| | D | 22 | 7 | 14 | | | | 8 | 23 | | | | | | | | | |
| Southern Rhodesia | C | 5 | 9 | 1 | | 2 | | 3 | | | | | | | | | | |
| Tanganyika | C | | | 1 | | | | | | | | | | | | | | |
| Canada: | | | | | | | | | | | | | | | | | | |
| Alberta | C | 6 | 4 | 4 | 7 | 1 | 13 | | 1 | | 1 | 1 | 3 | | | | | |
| Edmonton | C | | | | | | | | 1 | 11 | 1 | 1 | 2 | | | | | 2 |
| British Columbia—Vancouver | C | 5 | 16 | 21 | 5 | 4 | 8 | 8 | 13 | 9 | 17 | 12 | 24 | 16 | 16 | 10 | 17 | |
| Manitoba | C | | 1 | 14 | 16 | 5 | 1 | 7 | 16 | 2 | 1 | 4 | 3 | | 12 | 6 | 2 | |
| Winnipeg and vicinity | C | | | | 13 | 2 | 1 | 1 | | 1 | 1 | | | | | | | |
| Nova Scotia | C | | | | | | | | | | | 5 | 1 | | 1 | | | |
| Ontario | C | 3 | 15 | 12 | 4 | 4 | 2 | 5 | 4 | 1 | 14 | 17 | 7 | 4 | 25 | 47 | | |
| Kingston | C | 1 | | 1 | | | | | | | | | | | | | | |
| North Bay | C | | | | | | | 1 | | | | | | | | | 1 | 2 |
| Ottawa | C | 6 | 2 | 6 | 1 | | | 1 | | | | | | | | | | 1 |
| Sarnia | C | | | 1 | | | | | | | | | | | | | | |
| Toronto | C | | | | | | | | | | | | | | 1 | | | |
| Prince Edward Island | C | | | | | | | | | | | | | | 2 | | | |
| Quebec | C | 28 | 75 | 118 | 25 | 72 | 20 | 8 | 10 | 8 | 7 | 12 | 9 | 5 | 5 | 5 | | 14 |
| Montreal | C | 12 | 4 | 10 | | 1 | 1 | 1 | 2 | 1 | 2 | 3 | 5 | 2 | 2 | 1 | 3 | 10 |
| Quebec | C | 13 | 12 | 12 | 3 | 1 | 1 | 1 | | | | 4 | 4 | 2 | | 2 | | |
| Saskatchewan | C | 3 | 1 | 10 | 11 | 12 | 11 | 18 | 1 | 6 | 7 | | 3 | 2 | 13 | 17 | | |
| Moose Jaw | C | 2 | | 2 | 1 | | | | | | | | | | | | | |
| Regina | C | 1 | | | 2 | | | | | | 1 | | 2 | 4 | | | | |
| Saskatoon | C | | | | | | | | | | | | | | 3 | 1 | | |
| China: | | | | | | | | | | | | | | | | | | |
| Amoy | C | P | P | P | | | 1 | 1 | 2 | 1 | 1 | 1 | | | | | | |
| Canton | C | | | | 1 | | 4 | 9 | 7 | | | 11 | 14 | 21 | 36 | 16 | | |
| | D | | | | | | | | | | | 2 | 1 | | | 1 | | |
| Chefoo | C | P | | P | P | | | | | | | | | | | | | |

[1] Reports incomplete.

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

### SMALLPOX—Continued

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

| Place | | Aug. 26–Sept. 22, 1928 | Sept. 23–Oct. 20, 1928 | Oct. 21–Nov. 17, 1928 | Week ended— Nov. 24, 1928 | December, 1928 | | | | | January, 1929 | | | | February, 1929 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 8 | 15 | 22 | 29 | 5 | 12 | 19 | 26 | 2 | 9 | 16 | 23 |
| China—Continued. | | | | | | | | | | | | | | | | | | |
| Foochow | C | P | P | P | P | P | P | P | P | P | P | P | P | | | | | |
| Hong Kong | C | 9 | 13 | 66 | 17 | 33 | 61 | 91 | 81 | 73 | 80 | 85 | 91 | 78 | 58 | 80 | | |
| | D | 7 | 8 | 21 | 8 | 25 | 16 | 29 | 22 | 38 | 48 | 44 | 83 | 77 | 67 | 59 | | |
| Manchuria— | | | | | | | | | | | | | | | | | | |
| Changshun | C | | | | | | | | | | | | | | 3 | | | |
| Fushun | C | 1 | | 1 | | | | | | | | | 1 | | 1 | 3 | | |
| Harbin | C | 1 | 1 | 7 | 1 | 2 | | 1 | | | | 2 | 5 | | | | | |
| Kwantung—Dairen | C | 2 | 1 | 2 | | 2 | 2 | 1 | | | | | | | | 1 | | |
| | D | | 1 | | | | | | | | | | | | | 1 | | |
| Mukden | C | 2 | 1 | | | | | | | | 1 | | | | | 3 | | |
| Shanghai— | | | | | | | | | | | | | | | | | | |
| Foreigners only | C | 2 | 3 | 9 | 4 | 1 | | 1 | 5 | 9 | 5 | 4 | 8 | 3 | 4 | 8 | | |
| Including natives | D | | 6 | 20 | 6 | 11 | 6 | 9 | 14 | 12 | 14 | 24 | 15 | 18 | 18 | | | |
| Tientsin | C | 1 | 4 | 6 | 2 | | | | | | 4 | 2 | | 2 | | | | |
| Colombia: Cartagena | D | | | | 2 | 5 | | | | | | | | | | | | |
| Dominican Republic | C | | | | | | | | | | | | | | | 1 | | |
| Dutch East Indies: | | | | | | | | | | | | | | | | | | |
| Belawan Deli | C | 10 | 9 | 5 | 2 | | 1 | 3 | | 2 | 3 | 2 | 5 | 11 | 2 | | | |
| | D | 2 | 3 | 2 | 1 | | | 1 | | | 3 | | 1 | 4 | | | | |
| Borneo— | | | | | | | | | | | | | | | | | | |
| Pontianak | C | 4 | 2 | 1 | | | | | | | | | | | | | | |
| | D | | 1 | | | | | | | | | | | | | | | |
| Samarinda | C | | 3 | 16 | 15 | 3 | 1 | 8 | 8 | 3 | | | | | | | | |
| | D | | | 2 | 3 | 1 | | | 2 | | 1 | | | | | | | |
| Celebes—Makassar | C | | | | 1 | | | | | | | | | | | | | |
| | D | | | | 1 | | | | | | | | | | | | | |
| Java— | | | | | | | | | | | | | | | | | | |
| Batavia and West Java | C | 1 | 6 | 2 | | | 1 | | | | | | | | | | | |
| | D | | 2 | | | | | | | | | | | | | | | |
| East Java and Madura | C | 5 | 5 | 1 | | | | | | | | | | | | | | |
| | D | 6 | | 1 | | | | | | | | | | | | | | |
| Surabaya | C | 4 | 2 | 1 | | | 1 | 1 | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sumatra— | | | | | | | | | | | | | | | | | | | |
| Baros | C | | | | | | | | | | 70 | 26 | 50 | | | | | | |
| | D | | | | | | | | | | 22 | 8 | 12 | | | | | | |
| Medan | C | 7 | 14 | 4 | 2 | | 1 | | 3 | 1 | 3 | 2 | | | | | | | |
| | D | | 4 | 2 | 1 | | | | 1 | 1 | 3 | | | | | | | | |
| Ecuador (see table below). | | | | | | | | | | | | | | | | | | | |
| Egypt: Suez | C | | | | | | 1 | | | | | | | | | | | | |
| France (see table below). | | | | | | | | | | | | | | | | | | | |
| Great Britain: | | | | | | | | | | | | | | | | | | | |
| England and Wales | C | 430 | 514 | 581 | 199 | 189 | 155 | 176 | 201 | 131 | 188 | 213 | 171 | 239 | 250 | | | | |
| Birmingham | C | 1 | | | | | | | | | | | | | | | | | |
| Bradford | C | 1 | 1 | | | | 1 | | | | | | | | | 1 | | | |
| Bristol | C | | | | | | | | | | | | 1 | | | | | | |
| Cardiff | C | | | | | 1 | | | | | | | | | 4 | | | | |
| Castleford | C | 5 | 8 | 6 | | 4 | 1 | 3 | 3 | 2 | 4 | 7 | 4 | 14 | 16 | 14 | | | |
| Hull | C | 13 | 7 | 3 | 1 | | | | | | | | | | 2 | | | | |
| Leeds | C | 6 | | 1 | | | 1 | 1 | 1 | | | | | 1 | 1 | 1 | | | |
| Liverpool | C | | | | | | | | | | | | 1 | | | | | | |
| London | C | 8 | 12 | 21 | 5 | 4 | 4 | 1 | 6 | 10 | 14 | 6 | 6 | 13 | 17 | 4 | | | |
| Manchester | C | 3 | 1 | | | | | | | | | | | | | | | | |
| Newcastle-on-Tyne | C | | 1 | 1 | 2 | | | 1 | | | | | | | 1 | 5 | | | |
| Nottingham | C | 15 | 5 | 1 | | 2 | | 1 | 3 | | | | | | | 1 | | | |
| Plymouth | C | 3 | 2 | 6 | | | | | | | | | | | | | | | |
| Sheffield | C | 4 | | | | | | | | | | | | | | | | | |
| Stoke-on-Trent | C | | | 9 | 2 | 2 | 1 | 6 | 1 | 1 | 1 | 1 | 2 | 8 | 2 | 2 | | | |
| Scotland— | | | | | | | | | | | | | | | | | | | |
| Arbroath | C | 3 | | | | | | | | | | | | | | | | | |
| Dundee | C | 1 | 3 | 2 | | | 1 | | | | | | | | | | | | |
| Greece (see table below). | | | | | | | | | | | | | | | | | | | |
| Hedjaz | C | | | | | | | | | | | | | | | | | | |
| | D | | | | | | | | | | 22 | 26 | 55 | 21 | 22 | 55 | | | |
| India | C | 4,553 | 2,792 | 3,041 | 995 | 1,644 | 1,487 | 1,776 | 1,583 | 1,621 | 9 | 6 | 20 | 7 | 9 | 20 | | | |
| | D | 1,116 | 696 | 836 | 291 | 475 | 373 | 463 | 388 | 406 | | | | | | | | | |
| Bombay | C | 14 | 24 | 9 | 1 | 2 | 2 | 6 | | 3 | 10 | 21 | 34 | 42 | 44 | 38 | | | |
| | D | 11 | 12 | 4 | | | 2 | 2 | | 1 | 6 | 14 | 13 | 17 | 25 | 23 | | | |
| Calcutta | C | 13 | 7 | 2 | 3 | 2 | 4 | 4 | 6 | | | 4 | 8 | 4 | 7 | 13 | | | |
| | D | 17 | 4 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | | 3 | 5 | 1 | 3 | 7 | | | |
| Karachi | C | | 1 | | | | | | | | 2 | 4 | | 10 | 1 | 16 | | | |
| | D | | | | | | | | | | | | | 1 | | 4 | | | |
| Madras | C | 90 | 77 | 71 | 16 | 18 | 15 | 9 | 8 | 5 | 36 | 45 | 50 | 82 | 37 | 54 | | | |
| | D | 21 | 23 | 22 | 4 | 6 | 6 | | 2 | 1 | 4 | 18 | 6 | 11 | 12 | 6 | | | |
| Moulmein | C | 4 | 2 | | 2 | 2 | | 1 | | | | 3 | 2 | 2 | 2 | | | | |
| | D | 1 | | | | 1 | | | | | 1 | | | 1 | 1 | | | | |
| Negapatam | C | 46 | 51 | 38 | 5 | 16 | 7 | 5 | | 4 | 3 | 1 | 3 | 14 | 2 | 7 | | | |
| | D | 10 | 11 | 8 | | 2 | 1 | 2 | | | | | | 1 | | 5 | | | |
| Rangoon | C | | | 1 | | | | 1 | | | 1 | | | 4 | 1 | 3 | | | |
| | D | | | | | | | | | | | | | | 1 | | | | |
| Tuticorin | C | | 3 | | | | | | | | | | 1 | | 1 | | | | |
| Vizagapatam | C | 14 | 1 | | | | | | | | | 2 | 2 | | | 6 | | | |
| | D | 3 | | | | | | | | | | | | | | | | | |

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

### SMALLPOX—Continued

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

| Place | | Aug. 26–Sept. 22, 1928 | Sept. 23–Oct. 20, 1928 | Oct. 21–Nov. 17, 1928 | Week ended— Nov. 24, 1928 | December, 1928 | | | | | January, 1929 | | | | February, 1929 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 8 | 15 | 22 | 29 | 5 | 12 | 19 | 26 | 2 | 9 | 16 | 23 |
| India (French): | | | | | | | | | | | | | | | | | | |
| Chandernagor | C | 9 | 4 | 3 | | | | | | | | | | | | | | |
| | D | 2 | 4 | 3 | | | | | | | | | | | | | | |
| Pondicherry Province | C | 92 | 111 | 84 | 18 | 13 | 17 | | 24 | 19 | 11 | 21 | 22 | 13 | | | | |
| | D | 87 | 73 | 67 | 16 | 13 | 17 | | 20 | 18 | 10 | 14 | 20 | 13 | | | | |
| Indo-China (see also table below): | | | | | | | | | | | | | | | | | | |
| Pnompenh | C | 19 | 28 | 30 | 5 | 8 | 23 | 8 | 13 | 10 | 6 | 9 | 11 | 6 | 38 | 22 | | |
| | D | 15 | 10 | 5 | 4 | 4 | 9 | 3 | 8 | 6 | 1 | 6 | 8 | 3 | 17 | 14 | | |
| Saigon | C | 1 | 3 | 2 | | | | | | 2 | 1 | 9 | 2 | | 1 | | | |
| | D | | | 2 | | | | | | | | 6 | | | 1 | | | |
| Iraq: | | | | | | | | | | | | | | | | | | |
| Baghdad | C | 34 | 38 | 40 | 14 | 9 | 17 | 6 | 5 | 6 | 7 | 2 | 13 | 1 | 1 | 2 | 4 | 2 |
| | D | 17 | 12 | 23 | 9 | 18 | 13 | 5 | 10 | 1 | 6 | 12 | 2 | 1 | | | 4 | 1 |
| Basra | C | 1 | 28 | 35 | 13 | 12 | 5 | 5 | 3 | 3 | 5 | | 5 | 4 | 1 | 8 | 4 | 2 |
| | D | 1 | 9 | 33 | 11 | 8 | 4 | 3 | 2 | 2 | 3 | | 4 | 3 | 1 | 2 | 3 | 1 |
| Hillah Liwa | C | | | | | | | | | | 34 | 20 | 20 | | | | | |
| | D | | | | | | | | | | 5 | 9 | 9 | | | | | |
| Kirkuk Liwa | C | | | | 76 | | 64 | 33 | | | 86 | | | | | | | 9 |
| | D | | | | 19 | | 12 | 7 | | | 17 | | | | | | | 2 |
| Mossoul | C | | | 53 | 44 | 74 | 146 | 30 | 6 | 13 | 30 | 6 | 2 | | 23 | 5 | | 14 |
| | D | | | 28 | 19 | 42 | 42 | 7 | 12 | 14 | 5 | 8 | 4 | | 12 | 1 | | 2 |
| Sinjar | C | | | | | | | | | | 45 | 8 | 61 | | | | | |
| | D | | | | | | | | | | 1 | 4 | 15 | | | | | |
| Italy: Palermo | C | | | 2 | 1 | 2 | | | 1 | 2 | | | | | | | | |
| Ivory Coast (see table below). | | | | | | | | | | | | | | | | | | |
| Jamaica (outside Kingston) (alastrim) | C | 3 | 2 | | | | | | | | | 1 | | | | | | |
| Kingston (alastrim) | C | | | | | 1 | | | | | | | | | | | | |
| Japan: Nagasaki | C | | | | | | | | | | | | 1 | 1 | 1 | | | |
| | D | | | | | | | | | | | | | 1 | 1 | | | |
| Malta: Valetta | C | | 1 | | | | | | | | | | | | | | | |
| Mexico (see also table below): | | | | | | | | | | | | | | | | | | |
| Aguascalientes | D | | | | | | | 2 | | | 1 | | 1 | 1 | 1 | | | |
| Chihuahua | D | | | | | | | | | | | | 1 | | | | | |
| Jalisco (State) | C | | 11 | | | | | | | | | | | | | | | |
| Guadalajara | D | 3 | 1 | | 1 | | 1 | 2 | | 1 | | | | 2 | 2 | 4 | 4 | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Juarez | D | | 1 | | | | | | 2 | 3 | | | | 1 | | | | | |
| Mexico City and surrounding territory | C | 1 | 1 | 5 | | | | | 1 | | 1 | 5 | 2 | | | | | | |
| | D | 1 | | | | | | | | | | | | | | | | | |
| Saltillo | D | | | 1 | | | | | | | | | | | | | | | |
| San Luis Potosi | D | 1 | 2 | 1 | | | | | | | | | | | | | | | |
| Tampico | C | | | 1 | | | | | | | | | | | | | | | |
| Torreon | D | | 1 | | | | | | | | | | | | | | | | |
| Morocco (see table below). | | | | | | | | | | | | | | | | | | | |
| Nigeria: Lagos | C | | | 1 | | | | | | | | | | | | | | | |
| Poland | C | | 1 | 1 | | 2 | | 1 | 1 | | | | | | | | | | |
| | D | | | 1 | | | | | | | | | | | | | | | |
| Portugal (see also table below): | | | | | | | | | | | | | | | | | | | |
| Lisbon | C | | | | | | | | 2 | | | | 2 | | 2 | | | | |
| Senegal (see table below). | | | | | | | | | | | | | | | | | | | |
| Siam | C | 1 | 3 | 1 | 5 | | 3 | | | | | | | | | | | | |
| Bangkok | C | | | | 1 | | | | | | | | | | | | | | |
| Straits Settlements: Singapore | C | 1 | 2 | | | | | | | | 1 | | | 2 | 1 | 2 | | | |
| Sudan (Anglo-Egyptian) | C | 152 | 89 | 79 | 58 | 14 | 148 | | 192 | 157 | 129 | 13 | 190 | 17 | 58 | | 49 | 71 | |
| | D | 34 | 19 | 13 | 7 | 13 | 9 | 13 | 12 | 43 | 1 | 1 | 24 | 5 | 5 | | 13 | 14 | |
| Sudan (French) (see table below). | | | | | | | | | | | | | | | | | | | |
| Sweden: Stockholm | C | | | | | | 1 | | | | | | | | | | | | |
| Switzerland: Lucerne Canton | C | | 1 | | | | | | | | | | | | | | | | |
| Syria (see table below). | | | | | | | | | | | | | | | | | | | |
| Tunisia: Tunis | C | 1 | | 1 | | 1 | | 1 | 13 | | 1 | | | | | | | | |
| Union of South Africa: | | | | | | | | | | | | | | | | | | | |
| Cape Province | C | P | P | P | P | | | | | | | | | | | | | | |
| Natal | C | | | | | | | | | 1 | | | | | | | | | |
| | D | | | | | | | | | 1 | | | | | | | | | |
| Orange Free State | C | | P | P | | | | | | | | | | | | | | | |
| Transvaal | C | P | P | P | | | | | | | | | | | | | | | |
| Upper Volta | C | P | 10 | 5 | | | | | | | | | | 1 | | | | | |
| On vessel: S. S. Ballarat, en route to Cape Town, South Africa | C | | | 1 | | | | | | | | | | | | | | | |

| Place | | September, 1928 | October, 1928 | | | November, 1928 | | | December, 1928 | | | January, 1929 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1-10 | 11-20 | 21-31 | 1-10 | 11-20 | 21-30 | 1-10 | 11-20 | 21-31 | 1-10 | 11-20 | 21-31 |
| Indo-China (see also table above) | C | 73 | 38 | 19 | 43 | 55 | 57 | 32 | 23 | 100 | 120 | 74 | 130 | 107 |
| Ivory Coast | C | 2 | | 1 | | | | | | | | | | |
| Senegal | C | 4 | 2 | | | | | | | | | | | |
| Sudan (French) | C | P | P | 32 | | | | | 2 | | P | | | |
| | D | | | 2 | | | | | | | | | | |
| Syria: Beirut | C | | | 1 | | 1 | | 1 | | | 1 | | 1 | |

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

### SMALLPOX—Continued

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

| Place | | August, 1928 | September, 1928 | October, 1928 | November, 1928 | December, 1928 | January, 1929 |
|---|---|---|---|---|---|---|---|
| Brazil: Porto Alegre | C | 2 | 1 | 12 | 3 | ------ | ------ |
| British East Africa (see also table above): | | | | | | | |
| Kenya | C | ------ | ------ | 36 | 37 | 31 | ------ |
| Zanzibar | C | ------ | ------ | 2 | ------ | ------ | ------ |
| | D | ------ | ------ | 1 | ------ | ------ | ------ |
| Ecuador: Guayaquil | C | 38 | 22 | 6 | 6 | 13 | ------ |
| | D | ------ | 1 | 3 | 1 | 1 | ------ |
| France | C | 6 | 3 | 3 | ------ | 18 | ------ |
| Greece | C | 3 | 6 | 6 | 6 | 6 | 8 |
| | D | ------ | ------ | 1 | ------ | 1 | 1 |
| Mexico (see also table above) | D | 388 | ------ | ------ | ------ | ------ | ------ |
| Morocco | C | 1 | 4 | 5 | 2 | ------ | ------ |
| Portugal (see also table above) | C | ------ | 24 | 27 | ------ | ------ | ------ |
| | D | ------ | 2 | 3 | ------ | ------ | ------ |

### TYPHUS FEVER

| Place | | Aug. 26–Sept. 22, 1928 | Sept. 23–Oct. 20, 1928 | Oct. 21–Nov. 17, 1928 | Week ended— Nov. 24, 1928 | December, 1928 | | | | | January, 1929 | | | | February, 1929 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1 | 8 | 15 | 22 | 29 | 5 | 12 | 19 | 26 | 2 | 9 | 16 | 23 |
| Algeria: | | | | | | | | | | | | | | | | | | |
| Algiers | C | 2 | 1 | 4 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 5 | ------ | ------ | ------ | ------ |
| Oran | C | 2 | 1 | 2 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Bulgaria | C | 6 | 8 | 4 | 1 | 4 | 4 | ------ | ------ | ------ | 4 | 1 | 3 | 4 | ------ | ------ | ------ | ------ |
| | D | ------ | ------ | 1 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Sofia | C | 3 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Chile: Valparaiso | C | ------ | ------ | ------ | 1 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| | D | ------ | ------ | ------ | 1 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| China: | | | | | | | | | | | | | | | | | | |
| Canton | C | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 2 | ------ | ------ | ------ | ------ | ------ |
| | D | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 2 | ------ | ------ | ------ | ------ | ------ |
| Hong Kong | C | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | 1 | ------ | ------ | ------ | ------ | ------ |
| Manchuria— | | | | | | | | | | | | | | | | | | |
| Harbin | C | ------ | ------ | ------ | ------ | 2 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Kwantung | C | 3 | 2 | 1 | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ | ------ |
| Chosen (see table below). | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Egypt: | | | | | | | | | | | | | | | | | | | |
| Alexandria | C | 2 | | | | | | | | | | | | | | | | | |
| | D | 1 | | | | | | | | | | | | | | | | | |
| Assiout Province | C | | 1 | | | | | | | | | | | | | | | | |
| Beheira Province | C | | 2 | | | | | | | | | | | | | | | | |
| | D | | 1 | | | | | | | | | | | | | | | | |
| Cairo | C | 1 | 1 | | | | | | | | | | | | | | | | |
| | D | 1 | 1 | | | | | | | | | | | | | | | | |
| Daqalhiya Province | C | | | | | | | 15 | 4 | 3 | 3 | 1 | | | | | | | |
| | D | | | | | | | 1 | | | | 2 | | | | | | | |
| Menoufieh Province | C | | 1 | | | | | | | | | | | | | | | | |
| | D | | 1 | | | | | | | | | | | | | | | | |
| Port Said | C | 1 | 1 | 1 | | | | | | | | | | | | | | | |
| Suez | C | 6 | 4 | | | | | | | | | | | | | | | | |
| Greece (see table below). | | | | | | | | | | | | | | | | | | | |
| Ireland: | | | | | | | | | | | | | | | | | | | |
| Irish Free State— | | | | | | | | | | | | | | | | | | | |
| Clare County—Scariff | C | | | 1 | | | | | | | | | | | | | | | |
| Dublin | C | 5 | | | | | | | | | | | | 1 | | | | | |
| | D | | | | | | | | | | | | | | 1 | | | | |
| Kerry County: Tralee | C | 1 | 7 | | | | | | | | | | | | | | | | |
| Japan: Miyagi | C | | 2 | | | | | | | | | | | | | | | | |
| Lithuania (see table below). | | | | | | | | | | | | | | | | | | | |
| Mexico (see also table below): | | | | | | | | | | | | | | | | | | | |
| Aguascalientes | D | | | | 1 | 1 | | | | | | | | | | | | | |
| Chihuahua | D | | | | | | | | | 1 | | | | | | | | | |
| Mexico City, including municipalities in Federal District | C | 15 | 9 | 15 | 3 | 3 | 2 | 4 | 3 | 2 | 1 | 3 | 3 | 4 | | | | | |
| | D | 1 | 1 | 2 | | | 1 | | | | 1 | 1 | | 1 | | | | | |
| San Luis Potosi | D | | | | | | | | 1 | | | | | | | | | | |
| Morocco | C | 3 | 1 | 1 | 4 | | 4 | 8 | | | | 4 | 1 | 7 | 7 | | | | |
| Palestine | C | 10 | 11 | 6 | 4 | 4 | 3 | 1 | 1 | | 1 | | | 2 | | 1 | | 2 | |
| Poland | C | 65 | 31 | 81 | 15 | 17 | 32 | 53 | 47 | 73 | 38 | 45 | 33 | | | | | | |
| | D | | 4 | 10 | 3 | 1 | 2 | 5 | 2 | 5 | 4 | 5 | 5 | | | | | | |
| Portugal: Oporto | C | 1 | | | | | | 1 | | | | | | | | | | | |
| Rumania | C | 12 | 11 | 17 | 7 | | 15 | 20 | 21 | 49 | 38 | 59 | | | | | | | |
| | D | 3 | | | | | | 1 | | 2 | 3 | 6 | | | | | | | |
| Tunisia | C | 7 | | 4 | 4 | 2 | | | | | | | | | 2 | | | | |
| Menzel | C | | 1 | 1 | | | | | | | | | | | | | | | |
| Sfax | C | | 11 | | | | | | | | | | | | | | | | |
| Turkey (see table below). | | | | | | | | | | | | | | | | | | | |
| Union of South Africa: | | | | | | | | | | | | | | | | | | | |
| Cape Province | C | P | P | P | P | P | | P | P | P | P | P | | P | | | | | |
| East London | C | | 1 | | | | | | | | | | | | | | | | |
| | D | | | 1 | | | | | | | | | | | | | | | |
| Natal | C | 1 | P | P | P | P | P | P | 1 | 1 | P | | | | | | | | |
| Orange Free State | C | | P | P | P | P | | P | P | P | P | P | | P | | | | | |
| Transvaal | C | | | | | | | | | | | P | | 1 | | | | | |
| Yugoslavia (see table below). | | | | | | | | | | | | | | | | | | | |

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

### TYPHUS FEVER—Continued

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

| Place | | August, 1928 | September, 1928 | October, 1928 | November, 1928 | December, 1928 | January, 1929 |
|---|---|---|---|---|---|---|---|
| Chosen | C | 41 | 36 | | | | |
| | D | 6 | 2 | | | | |
| Chemulpo | C | | | 1 | 1 | | |
| Seoul | C | 1 | 2 | 3 | | 3 | |
| | D | | 1 | | | | |
| Greece: Athens | C | | 1 | 1 | 4 | 1 | |
| Lithuania | C | 15 | 1 | | 4 | 11 | 32 |
| | D | 2 | | | | | 3 |
| Mexico: Sonora (see also table above) | D | | | | | | 1 |
| Peru | C | | | | | 3 | |
| Turkey | C | 4 | 6 | 4 | | 19 | 1 |
| | D | 2 | | 1 | | 3 | |
| Yugoslavia | C | | 6 | 1 | 17 | 7 | 15 |
| | D | | | | 1 | | |

### YELLOW FEVER

| Place | | Aug. 26–Sept. 22, 1928 | Sept. 23–Oct. 20, 1928 | Week ended— Oct. 27, 1928 | November, 1928: 3 | 10 | 17 | 24 | December, 1928: 1 | 8 | 15 | 22 | 29 | January, 1929: 5 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brazil: | | | | | | | | | | | | | | | |
| Bahia | C | 1 | | 1 | | | | | | | | | | | |
| | D | 2 | | | | | | | | | | | | 1 | |
| Para | D | | | | | | | | | | | | | | 2 |
| Rio de Janeiro [1] | C | 9 | 6 | 1 | 1 | | | | | 2 | | | | | |
| | D | 8 | 4 | 1 | | | | | | | | | | | |
| Dahomey: Ouidah Military Camp | C | | | | | | 1 | | 1 | | | | | | |
| | D | | | | | | 1 | | | | | | | | |
| Gambia: Bathurst | C | | | | 2 | | 2 | 2 | | 1 | | | | | |
| | D | | | | | 1 | | 1 | | 1 | | | | | |
| On vessel: | | | | | | | | | | | | | | | |
| S. S. Berini, at Santos, Brazil | C | | 4 | | | | | | | | | | | | |
| | D | | 1 | | | | | | | | | | | | |
| S. S. Victoria, at Manaos from Para, Brazil | C | | | | | | | | | | | | | | 1 |
| | D | | | | | | | | | | | | | | 1 |

[1] 29 cases of yellow fever with 14 deaths were reported at Rio de Janeiro during January, 1929, mostly suburban. During February there were 25 confirmed cases of yellow fever at Rio de Janeiro, with a mortality of about 66 per cent of the cases.