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THE HISTORY OF MALARIA IN THE UNITED STATES

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That malaria was once highly prevalent in northern United States is a matter of common knowledge. Thousands of people now living, physicians and laity, testify to the prevalence of a disease of which many of them were the victims. Literature, medical and non-medical, contains many references to the fever and ague of the early days. Morbidity and mortality reports of States and cities record the high prevalence and subsequent decrease of the disease.

Undoubtedly malaria got the blame for much illness that it did not cause. Thayer (1) gives an illustration of the loose diagnosis of "malaria" formerly made in some localities. During the six years ended in 1890 the cities of New York, Brooklyn, and Baltimore reported 4,407 deaths from malaria and 3,937 deaths from typhoid fever, the death rates from the two diseases being thus nearly equal. In the Johns Hopkins Hospital during a period of somewhat over seven years following its opening, two of the years being included in the above-named period, 48 deaths from typhoid were recorded and only 3 from malaria. That is, among the carefully diagnosed cases of the Johns Hopkins Hospital there was a ratio of 16 typhoid deaths to 1 malaria death, while in the city of Baltimore the ratio reported was nearly 1 to 1.

But, however much malaria may have been burdened with the belongings of other diseases, there was undoubtedly a large bulk of it at the bottom. When large numbers of people come down in the autumn with attacks of chills and fever which often occur every other day and yield to quinine, a microscope is hardly needed to prove that a good deal of real malaria is concerned in the matter. Joseph G. Cannon (2), formerly Speaker of the House of Representatives, whose father was a country physician, has given a very graphic account of the popular diagnosis of malaria in the early days in Indiana:

> We had standard diseases and standard remedies on the Wabash. We had ague as a regular disease, and it was not difficult to diagnose. You could feel it and you could see it with the naked eye. Other people could also feel it when the patient had a chill, for he shook the house. Our standard remedies for ague were calomel, castor oil, and quinine, and they were not measured out on the

apothecary's scales. Ten grains of calomel was a dose for a congestive chill, followed with a big dose of castor oil and then all the quinine that could be poured into the victim. We did not have capsules to protect the quinine until it got into the stomach. It was in powder and had to be swallowed raw or diluted in water, and in either case it was medicine, patently so to the patient in trying to swallow it.

Among medical observers we have the testimony of Osler (3), who states that "Parts of the Province of Ontario were hotbeds of the disease, which within my memory has disappeared from the districts about the western end of Lake Ontario and the northern shores of Lake Erie." Dr. V. C. Vaughan has written me that in the early eighties death rates from malarial fevers in Michigan ran about 20 per 100,000. Since 1915 the annual mortality has dropped to about 0.1, and in the last few years it has gone even lower than that. Mr. J. A. LePrince states that malaria was not uncommon on Manhattan Island, where he lived in the early eighties. He himself suffered from a three weeks' attack, and his brother had it every autumn. Dr. Henry R. Carter, in 1925, wrote me the following statement in regard to malaria in Illinois:

In the country just north of Cairo, Ill., in 1879, malaria was excessively prevalent. Few were living in that country save negroes. They were only farming it. The food in this country—I have eaten at their houses—was coarse and with little variety, but rather more than abundant. The houses of the whites were good to fairly good. Few screens. I visited it again in the fall of 1887. Malaria still prevailed here, but not more than 25 per cent of what I had seen before. The negroes, who had cleared and partly ditched the land, had been replaced by white farmers. In 1910 I visited Cairo a third time, and was told, although I did not go up into the "bottoms," that while there was malaria there, there was no great deal. Very few negroes, and the land was mainly drained. It was not a stock country, corn and hay being the crops—the first mainly.

Evidence of much value is furnished by the records of certain hospitals, which, for many years, have confirmed the diagnosis of malaria by blood examination. The Massachusetts General Hospital, Boston, has kindly furnished me with a record of the cases of malaria occurring in that hospital. I have arranged the figures in 5 and 10 year periods:

1874–1878	40	99	1904–1908	85	155
1879–1883	59		1909–1913	70	
1884–1888	87	227	1914–1918	38	57
1889–1893	140		1919–1923	19	
1894–1898	265	473	1924–1928	9	
1899–1903	208				

Thayer and Hewetson (4) state that during the period between June, 1889, and January, 1894, 616 cases of malaria were observed in the wards and out-patient department of the Johns Hopkins Hospital. The Johns Hopkins Hospital has kindly furnished me the following

figures for later periods: From 1895 to 1900, 609 cases; from 1920 to 1925, 24 cases. The number of admissions for all causes more than trebled between 1895 and 1924.

In both of these hospitals there has been a marked diminution of malaria cases in late years. Their records probably reflect the changes which were going on in Boston and Baltimore and the territories adjacent to these cities. These figures doubtless include cases contracted outside the United States; and the rates for the years subsequent to 1898 may have been influenced by infected soldiers of the Spanish-American war returning from Cuba and the Philippines, or by local epidemics originating from these repatriated cases.

At present malaria is not a serious disease in the part of the United States north of the thirty-eighth parallel. In recent years it has been limited in that section to local epidemics of a relatively mild character which have been reported from New England, New York, and New Jersey, and to scattered cases in other States. In the Mississippi Valley the most northerly strongholds of the disease at present are in southeast Missouri and western Tennessee. It is still endemic in the Rio Grande Valley of northern New Mexico. In 1928 Barber, Komp, and King (5) examined the blood specimens of 366 school children there, mostly Indians or Spanish-Americans, and found 6.5 per cent positive. The highest rate found in any one school was 14.3. In 1926 we found 28.3 per cent positive among 60 Indian children of San Juan Pueblo. The upper Rio Grande Valley of New Mexico is in about the same latitude as Tennessee, but its great elevation, 5,600 feet, would place it in a northern rather than a southern climatic region. Malaria is still endemic in central California.

In the Southern States malaria is still prevalent, especially in the valleys of the larger rivers. There is no doubt, however, that malaria has decreased in the South as well as in the North, although the diminution has been less marked and has proceeded at a slower rate. Bass (6) states that malaria was rife in New Orleans and the territory surrounding it between 1890 and 1900. Large numbers of cases were treated in the New Orleans Charity Hospital, where at present they are so few that it is difficult to get enough material for teaching purposes. Dr. Henry R. Carter has noted a decrease in North Carolina and Virginia. His observations will be given in more detail below. In the Delta region of the Mississippi Valley we have some figures which compare the blood parasite rates of surveys made in 1915–1918 with those found some 10 years later. In August and September, 1925, Barber, Komp, and Hayne (7) found 3.8 per cent positive among 288 plantation negroes of Lake Village, Ark. In April and May, 1916, Derivaux and Haas (8) obtained a parasite rate of 16.5 per cent among 351 plantation negroes of the same locality.

In 1927 and 1928 Carley and Balfour (9) obtained a malaria parasite rate of only 0.5 per cent among 577 white children, and 3 per cent among 764 colored children of Sunflower County, Miss. They compare these rates with those obtained in the same county by Bass and his associates in 1916–1918. Bass found 22.2 per cent positive among 7,639 persons. Carley and Balfour believe that there has been an enormous decrease in malaria in that region during the past 10 years.

It is difficult to get figures exactly comparable, for populations change from year to year, and the malaria curve has its minor peaks, although its general trend may be downward. That there is still much malaria in certain parts of the South is evidenced by the high parasite rates that have been recently obtained in some localities. In the autumn of 1928, Meleney, Bishop, and Roberts (10) found a malaria parasite rate of 23 per cent among 122 negro school children of Lake County, Tenn., and of 12.2 per cent among 721 white school children. The malaria rates of this region may have been influenced by the flood of 1927. During the same autumn we obtained in Leflore County, Miss., a malaria parasite rate of 15.1 per cent among 438 negro children of rural schools, and of 5.2 per cent among 270 white rural school children. The highest rate we obtained in any one locality was 32.7 per cent among 52 children of a negro school. Leflore County was little affected by the flood of 1927. Both Leflore and Lake Counties are in the Mississippi Delta, the alluvial plain of the Mississippi River. In the spring of 1929, in the rural sections of Dougherty County, Ga., the blood parasite rate of 1,200 school children was 33 per cent. In the autumn of 1928 we found a blood parasite rate of over 50 per cent among 83 persons in a limited area in northern Florida. So there is conclusive evidence of a recrudescence of malaria in some parts of the South during the past two years.

Taking the evidence as a whole, however, the fact seems to be well established that malaria, once very prevalent in the Northern States, has almost disappeared there and has diminished in the Southern States. Several factors have been suggested as contributory to the decline of malaria in the United States, and these or very similar ones have been regarded as effective in bringing about a decrease in the disease in various countries of Europe.

1. *Anopheles* mosquitoes have been reduced in numbers by drainage done for agricultural purposes.

2. Quinine, in use from the beginning of the settlement of the country, has become cheaper and more generally used. Medical assistance has become more generally accessible.

3. Dwellings have improved and the amount of screening has vastly increased.

4. Domestic animals, serving to divert blood-seeking mosquitoes from man, have become more numerous, and their stables have been so far improved that they afford better resting places for mosquitoes than do human dwellings.

5. Malaria parasites have decreased in virulence.

6. The country has become more prosperous, so that people can afford better food and clothing and more abundant screens and quinine. The better nourished, clothed, and housed people are, the more resistant they are to the effects of a malaria infection and the better they respond to medical treatment.

It is evident that these factors are more or less cooperative; as one rises or falls it tends to pull the others with it. The relative efficiency of a factor or group of factors may vary with locality or circumstances, and all are dependent on the agricultural development of the country, as some personal histories will illustrate.

In 1925, the year of his death, Dr. Henry R. Carter wrote me the following account of his observations on malaria in Virginia:

1. There was a great increase of malaria after the Civil War in my section of Virginia—just above tidewater. This country had never been free from malaria; but, on our plantation at least, it had not been of sanitary importance for a number of years. After the war several of the family had it—I and two little sisters—and it was fairly general, though not severe, all over our neighborhood.

(*a*) Living conditions were hard. From the time Sheridan went through, in April, 1865, we had no meat of any kind—save a few birds and two rabbits that we boys killed with stones (firearms had been taken away)—until November 18, when we killed a wild hog (a descendant of tame ones) in a trap. We had a little flour, and our family lived practically on partially spoilt corn (the "nubbin pile"—all the rest had been taken), potatoes, and wild salad plants, especially water cress. In land our people were rich (there were some 1,600 acres in this plantation), and I judge our neighbors fed no better than we.

(*b*) Ditches were filled up and cleared land was overgrown.

(*c*) Livestock had practically been removed. Save mules and horses, however, they had never been housed, and the latter not much in the summer time.

(*d*) Quinine was scarce, high priced, and difficult to obtain.

Malaria gradually disappeared here as the country resumed its former status, retreating toward the east.

2. Up to about 1870 our country was mainly engaged in the raising of wheat as a money crop, considerable corn, however, being also raised for the horses and mules used to plow for the wheat. With the opening up of the Northwest (Minnesota and Dakota) as wheat States and the drop in transportation rates on the land-grant roads from this section and from Iowa about that time, wheat was no longer profitable in Virginia and was, to an extent, substituted by tobacco and by cattle.

Naturally this led (*a*) to economic depression; (*b*) to neglect of drainage and growing up of cultivated land, especially low land—wheat was raised on fairly high, always well-drained, land and corn on low ground, but little corn being now needed, much of this was also turned out; (*c*) the number of cattle was increased, but they were not housed in summer—quinine, if anything, was cheaper; (*d*) a decided diminution in population.

Malaria increased considerably. Not to the same extent as directly after the Civil War, but it has continued more or less ever since, as have indeed the other conditions.

Take your choice as to the weight of the different factors. We thought—and I still think—that the abandonment of the land, and especially of the bottom land, leading to poor drainage, was the most important. Tobacco, you know, is cultivated only on well-drained land and usually in small patches, as one can not attend to a large area.[1]

In commenting on the different factors to which the decrease of malaria in Virginia and elsewhere has been ascribed—drainage, clearing, increase in numbers of housed cattle, better nutrition of the people, and better medical attendance, Doctor Carter stated:

I doubt whether we can differentially evaluate these factors, and theoretically their action in the diminution of malaria is by multiplication, not by addition, and each one is greater than unity. Their combined action, then, would be decidedly greater than if any one of them were left out.

I, myself, am inclined to lay most value upon those that lessen the production of *Anopheles* and the access of *Anopheles* to man; but unquestionably they together make an endless chain for good, accomplishing a result decidedly in excess of what anyone would do.

According to the same excellent authority (Carter (11)), malaria has also decreased in North Carolina. Doctor Carter visited a tidewater section of North Carolina in 1896 and again in 1913. His observations confirm the opinion of all the older practitioners of that district that malaria is far less prevalent than it was 20 or 30 years ago. Doctor Carter ascribes the decrease of malaria there to two principal factors—(1) the increased prosperity of the country people, and (2) the lowered price of quinine. The farmers of that region (then essentially a farming country) live much better than they did; they cleaned up and drained more land and kept it freer from standing water and brush, the breeding place and shelter of mosquitoes. At the time when malaria was prevalent, quinine sold for $4 to $4.50 per ounce and was used sparingly by poor people and rarely taken by them except on a physician's prescription. In 1913 (the date of Doctor Carter's publication) it cost only 25 to 28 cents per ounce and was administered in large doses by the farmers themselves, and the treatment was longer continued.

I spent much of my boyhood on a farm in southeastern Kansas. The country was wooded along the streams, but generally consisted of a gently undulating prairie. The earlier settlers came into the country in the late sixties and early seventies, first occupying the lands along the creeks and rivers. Later the population spread all

[1] A blood-parasite survey of school children of eastern Virginia is now being made by the Public Health Service field investigations of malaria under the direction of Surgeon L. L. Williams, jr. Doctor Williams writes me that of those already examined, 3,045, only 0.9 per cent have proved to be positive. The morbidity and mortality reports of the State Board of Health of Virginia show a steady decline in malaria between 1920 and the present time.

over the prairie country. Malaria, or what everybody called malaria, was abundant during the seventies, or at least during the earlier part of that decade. Our own family had it every autumn. In the eighties it became far less common, and now it is of no serious importance, if present at all.

There was no extensive drainage in the early times, because there was so little standing water to drain. Some wet ground occurred here and there, which was drained when the land was plowed; a "dead furrow" was often all that was needed to get rid of the water. Such places usually dried up during the summer and autumn. The more permanent water was found in the sluggish creeks then as it is to-day. No doubt the character of the water in the creeks was somewhat modified by the cultivation of the neighboring soil; but we know from our observation in the Southern States and in other localities that *Anopheles* breeding will continue in ponds and swamps after the land in their immediate neighborhood has been brought into cultivation.

As the land farther away from the creeks became occupied, there arose a need for ponds to supply water to domestic animals. A great many of these ponds were constructed, the most of them by merely scraping out a hollow at the bottom of a slough and making a dam of the earth that was removed. After heavy rains these places became filled with water, a part of which usually remained throughout the most of the summer, even in dry years. After a few years, aquatic vegetation appeared in many of these ponds, making them favorable places for the production of *Anopheles*. These ponds were mostly built well out from the bottom lands and do not seem to have produced enough *Anopheles* to check the diminution of malaria. Taking the country as a whole, there is now probably as much standing water as there was when it was first cultivated, but it may be that the bottom lands were more productive of mosquitoes in the early days than they are at present.

The first houses built in the country were mostly poor affairs, frame structures "boarded up and down" and often unscreened. Screens came into general use in the late seventies or early eighties, as I remember, but were found here and there at a much earlier period.

In the early days of the country, domestic animals were kept in sheds covered with long grass, which were gradually replaced by barns or shelters of a more substantial character. In many of the barns a haymow was built immediately over the place where the animals were stabled, forming an excellent retreat for *Anopheles*. I have often seen thousands of *A. quadrimaculatus* in stables of that type situated in the prairie rice country of Arkansas. Horses and mules were usually housed in stables at night, summer and winter, but cattle remained out of doors in corrals during the warm weather.

Quinine was in general use from the beginning of the settlement of the country. The dosage seemed adequate, at least to those of us who had to take it in water from a tablespoon. In some parts of the Missouri Valley quinine was mercifully sandwiched between layers of moist slippery elm bark before it was administered. Some people used to put a spoonful of quinine in their coffee, especially those who did not hold to the orthodox opinion that malaria came from the newly turned sod but believed it came from creek water.

Along in the eighties the growing population began to fill the prairies at some distance from the creek bottoms. These earlier prairie settlers often lived in a very primitive fashion, some of them in sod houses. Malaria, or what was left of it at that time, clung to the "bottoms" and did not follow the people to the hills.

There were occasional hard times among the people of southeastern Kansas, but no such periods of severe agricultural depression as those described by Doctor Carter during war times in Virginia. There was a fairly steady increase in the prosperity of the country. We hear of regions the development of which has been prevented or long retarded by malaria; but it is noteworthy that the progress of the States of the Middle West was not checked by malaria, although the pioneers of many States suffered severely from it. The longer winters of the North may have afforded sufficient respite from the disease to permit of the annual recuperation of the people.

I have some trustworthy information in regard to the history of malaria in the wooded country of western Missouri in the valley of the Missouri River. Malaria was plentiful in the late sixties and early seventies. Nearly everybody along the river bottoms suffered from it, but the hill country was spared. In many cases attacks were of a typically tertian character. Bed nets were in common use in the early days; wire screens began to come in during the early eighties. Quinine in large bottles stood on the clock shelf of every home in the "bottom" lands, together with a tumbler of water containing slippery elm bark. In some families quinine taking was a daily ritual—not as a preventive, because the people were so rarely free from malaria that there was no question of anything but cure. Malaria began to diminish in a marked degree in the late seventies, about the time it began to decrease in the prairie country. There was not much drainage in the Missouri region; there the disappearance of malaria seemed to coincide with the clearing of the forests and the introduction of screens.

The popular explanation of the disappearance of malaria in the Northern States varied with locality and time. In a timbered country the decrease of malaria was attributed to the clearing of forests; in a prairie country to the mellowing of the soil; and in many swampy countries to the use of tiles or other methods of drainage.

It is plain how closely the prevalence of malaria was associated with pioneer life and its decrease with the agricultural development of the country. It is difficult to weigh the several factors concerned even in a particular region and under fairly constant conditions. Some observations made in this country during more recent times may help us to determine at least whether any factor was indispensable.

There can be no doubt of the fact that anopheline intensity had much to do with the prevalence of malaria in former times as it has now—the association of malaria and lowlands seems to prove that—but it is worth while to inquire whether malaria may decrease or disappear in the presence of large numbers of *Anopheles*.

In 1923–1925, with Komp and Hayne (12), I made some investigations of malaria in the prairie rice regions of Arkansas and Louisiana, where rice has been cultivated for 25 years or more. The irrigated rice fields produce abundant *A. quadrimaculatus* from June to September. Barns, unscreened dwellings, schoolhouses, and any favorable shelter may swarm with adult *Anopheles*. In Arkansas the malaria rate in the midst of the rice region is low, but it appears to be higher at its borders. In Louisiana it is more generally low and hardly constitutes a serious health problem. The people in the rice region are generally prosperous. They live in good houses, for the most part well screened, and are not neglectful of treatment when they are ill. From all the local evidence we could obtain, it appeared that malaria was once far more prevalent in these regions than it is now; it has diminished and now remains low in spite of the presence of large numbers of a species of *Anopheles* known to be an efficient vector of malaria.

In the autumn of 1928 we made a survey of a region in and near Elsberry, Mo., a town located about 60 miles north of St. Louis. This town is built on the higher ground at the edge of the bottoms of the Mississippi River. These bottom lands contain extensive rice fields, which are located about a mile from the town. Adult *Anopheles* were very plentiful in the town itself and in farm buildings near the rice fields. Of those which we collected and identified, about 95 per cent were *A. quadrimaculatus*. The majority of these probably bred in the rice fields, where we found their larvæ plentiful, but they also bred in small ponds and pools near the town.

It appeared from the evidence of a local physician and of other good observers that malaria was once very plentiful in that region, but had become rare. In order to get some objective evidence on the subject, we collected and examined blood specimens from 136 school children, white and colored, in four schools situated in or near Elsberry. Not a single positive was found. About one-third of the children lived in the "bottoms," the remainder in the town.

Rice cultivation began in that region about five years before our visit. It was noted that the mosquito nuisance greatly increased at the time rice cultivation began. The country is well screened.

This observation shows that *A. quadrimaculatus* may be produced abundantly in a northern region, and that an increase in *Anopheles* is not immediately followed by an increase in malaria. It will be interesting to follow the history of this locality to determine whether malaria ever becomes plentiful there.

Osler (l. c.) in speaking of malaria in the districts about the western end of Lake Ontario and the northern shores of Lake Erie, states: "The marshes are still there and the *Anopheles* are there, but the disease has gone. As in parts of Italy, the important factor appears to have been the cinchonizing of the inhabitants."

In view of the fact that *Anopheles* are still present in large numbers in regions where malaria has disappeared or greatly decreased, it appears that a decrease in *Anopheles* was not an indispensable factor generally, however effective it may have been in some other regions.

It is doubtful whether screening alone could explain the rapid decrease in malaria observed in some States. An observation made by Barber and King (13) in southern New Mexico may be pertinent in this connection. In a certain rural locality malaria has increased rapidly during the past four or five years, although the percentage of screened houses is high—over 90 per cent. In both amount and quality the screening is as good as it is in most of the rural regions in the Northern States at present, and must be far superior to that which obtained in these States at the time when malaria was rapidly decreasing. In most of the rural regions of the United States people are accustomed to spend a good deal of the early evening out of doors during warm weather. Screening is little practiced in Europe, but some regions there have shown a rapid decrease in malaria.

Quinine is a factor hard to eliminate from the malaria equation in this country, for a part of the people everywhere have taken it some time at least. The cheapening of the drug may have led to its more general use and hastened the disappearance of malaria in some of the States. The experience of troops in southern Europe during the World War, however, has shown that quinine alone can not prevent a serious prevalence of malaria.

An increase in the prosperity of the rural inhabitants of a malarious region has generally led to a decrease in malaria; but, as we have seen, the economic factor may include all of the others. In every region of high endemic malaria I have visited in this country, or any other, I have always found a considerable body of rural population poorly housed and inadequately treated for disease.

It is quite possible that the longer persistence of malaria in the Southern States has been due to the character of the rural popula-

tion as well as to the warmer climate or longer seasons. In the cotton-growing regions especially there are large numbers of renters, negroes or "poor whites," who occupy very indifferent cabins, often situated near swamps or bayous. Negro labor is also employed in the prairie rice regions of Arkansas and Louisiana, but nearly all the negroes live in towns, and those employed in the fields go out daily to their work. Likewise, in the region around Elsberry, Mo., the negro population is mostly concentrated in towns.

We have no reliable data on the possible effect of domestic animals on the disappearance of malaria in the Northern States. It is alleged that an abundance of dark, warm stables is important or necessary if *Anopheles* are to become "animalized" to the extent that they no longer seek man. Such stables are now uncommon in the South and probably were relatively few in the North at the time when malaria began to decrease. There is little evidence that any species of *Anopheles* in either region has become zoophilic in the sense of Roubaud. Nor have we any definite information as regards a possible diminution in the virulence of the malaria parasites. Cases of extreme severity are not uncommon in this country, especially among white people. Negroes seem to be less susceptible to the effects of a parasitic infection.

It would seem that not one of the factors we have mentioned, with the possible exception of the use of quinine, was indispensable to the decline of malaria, however effective any one may have been in cooperation with the other factors.

It is pertinent to our study to ask whether the regions of the United States once malarious but now free from this disease have become malaria proof. It would seem a priori that where so great a fire has burned and gone out of itself there must have been a lack of suitable fuel, and that the reintroduction of carriers would not lead to a serious increase in malaria so long as things remain in their present economic condition. New carriers have, in fact, come into the Northern States from three different sources—soldiers of the Spanish-American War returning from Cuba or the Philippines, immigrants from malarious regions of southern Europe, and negroes migrating northward from the rural regions of the Southern States. Minor epidemics of a transitory character have been reported as the result of the introduction of the first two groups mentioned. The negroes from the South have mostly gone to factories in northern cities where they could not much affect the transmission of malaria.

Possibly a severe famine or other adverse economic condition might make the Northern States again subject to severe malaria; but in the absence of some very profound social change it would appear that the danger is not great, even in regions where *Anopheles* still exist in considerable numbers.

In the North the decrease in malaria seems to have come about quite independently of any conscious effort on the part of health agencies. It had nearly disappeared by the time that the method of transmission of the disease by mosquitoes was discovered. In the South there have been a good many antimosquito campaigns, but nearly all of these have been limited to the protection of towns; and, as Bass (l. c.) states, if we grant 100 per cent efficiency to all of these campaigns they could account for only a small percentage of the observed decrease in malaria. Education may have played an important part in the decrease of malaria in the South, especially by encouraging prompt and thorough treatment of cases and the installation of screens in dwellings. Such education has been promoted by health officers as well as by medical schools and physicians. But it is probable that the large part of the diminution of malaria in the South, as in the North, was due to the development of the country rather than to any conscious effort on the part of health agencies.

It would seem that the study of the causes of the spontaneous diminution of malaria might afford some hint as to the best measures to use in hastening its disappearance. It goes without saying that if we could do away with all the *Anopheles* of a neighborhood we would cut off the evil at the root. In localities where the population is concentrated in towns or where the breeding places of *Anopheles* are much limited a direct attack on the *Anopheles* may be the method of choice. In rural neighborhoods antilarval measures are much more difficult, but even a partial destruction of *Anopheles* may prove of value in localities where the other antimalarial factors are fairly efficient. We often speak of *Anopheles* "in sanitary numbers" without realizing how such numbers may vary with conditions, such as the amount of endemic malaria or the economic level of the people.

The history of malaria in this and other countries, however, indicates that the disease may greatly diminish in spite of the presence of large numbers of *Anopheles*, especially where social conditions have materially improved. The health officer can not be expected to take on his shoulders the economic betterment of a community, although he may sometimes put health considerations into the scales when a large drainage project or other agricultural improvement is debated. But he can promote such factors of civilization as have proved to be beneficent in reducing malaria—screening, prompt and thorough treatment, and education. His efforts will be the more availing since he has only to follow and direct a current which, in this country at least, already sets strongly toward improvement in rural conditions of living.

SUMMARY

Malaria was once very prevalent in the northern United States. During the past 50 or 60 years it has greatly diminished and is no longer a serious problem there. In the Southern States malaria has also decreased, but in many localities the rate is still high and constitutes an important sanitary problem.

The liability of a serious increase of malaria in the North is not great so long as the present economic status of that region persists; in the South the danger of a recrudescence of the disease is much greater, as the events of the past few years have demonstrated.

The factors concerned in the diminution of malaria in the United States are interdependent; their importance has varied with time and locality, but all have been closely related to the agricultural development of the country.

The study of the history of malaria in a country may afford useful information as to the best means of combating the disease. It is very desirable that such study be continued in this country, since, as the years pass, necessary data become more and more difficult to obtain.

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THE USE OF STEARATES (CALCIUM AND ALUMINUM) AS DILUENTS FOR PARIS GREEN IN ANOPHELES CONTROL

A Preliminary Report

By A. F. DOLLOFF, *Entomologist, United States Public Health Service*

The use of Paris green as a larvicide for anopheline mosquitoes, with hydrated lime as a diluting agent, has become standard practice in this country. According to Barber, the anopheline larvæ, being surface feeders, ingest particles of Paris green, which are supported by the surface tension layer of the water. Since these particles are relatively heavy, the floating period is presumably short. The lime, being slightly soluble (0.17 parts per 100 at 0° C.) and moderately heavy (specific gravity 2), it can not be expected to add materially to the capacity of the Paris green to remain on the surface of treated water. Barber reports the finding of small larvæ after two days from the time of dusting. The question has arisen as to whether some highly insoluble and lighter substance would not keep the larvicide on the surface longer, delaying the reappearance of the larvæ, and, therefore, serving as a more useful diluent. The stearates of calcium and aluminum have these physical properties, and results of a few experiments with these substances lend some basis to the belief that they may be useful for this purpose.

Field experiments were carried out on two impounded reservoirs heavily matted with *Chara*, together with *Lemna*, *Wolfia* and several kinds of filamentous, green and blue-green algæ. Test areas varied from about one-half acre to 5 acres in extent; and those in use concurrently were separated from each other by a strip of land, several hundred feet of pond surface, or wind direction at the time of dusting. Areas were first dipped to determine the incidence of larvæ, then dusted, and dipped daily until larvæ were again found in significant numbers. Dusting was done from boats with Savage hand-power dust guns. All dust mixtures were prepared by weight.

In one set of field experiments the effect of Paris green mixed with lime was compared with that of Paris green mixed with calcium stearate, and of Paris green mixed with aluminum stearate. The concentration of Paris green varied; but in all but two of the experiments the applications were such as to insure the use of from one-half to 1 pound of Paris green per acre. The average number of days from the time of dusting to the appearance of a significant and sustained increase in the number of larvæ was as follows: In the areas dusted with Paris green and lime, 3; in those dusted with Paris green and calcium stearate, 5¾; and in those treated with Paris green and aluminum stearate, 6. These results, with the number of experiments involved, are shown in Table 1.

Two field experiments with a mixture of 5 per cent calcium stearate, 20 per cent Paris green, and the remainder lime, and one experiment each with similar mixtures containing 10 per cent calcium stearate, 20 per cent calcium stearate, and 40 per cent calcium stearate, respectively, were inconclusive as to the possibility of substituting lime for the more expensive stearate. In this series the dust containing 5 per cent stearate was apparently no better than those series in which lime was the only diluent; that containing 10 per cent stearate prevented the return of larvæ 2 days longer; that containing 20 per cent stearate 1 day longer, and that containing 40 per cent stearate at least 3 days longer than did the control mixtures of Paris green and lime. (See experiments 8a–12a, and Table 1a.)

Microscopic examination of stearate taken from the surface of the water five days after application revealed particles of Paris green adhering to those of the stearate.

The only rain of any importance during the investigation seemed to have no effect on the duration of the lethal period in the area treated with the Paris green and calcium stearate.

In the absence of more field data a laboratory experiment was set up in the open, in which larvæ were placed in aluminum pans, 10 inches in diameter and containing about 1½ inches of water. These were dusted with (1) Paris green and lime, (2) Paris green and calcium stearate, and (3) Paris green, lime, and calcium stearate, in proportions varying from 5 per cent calcium stearate to 40 per cent calcium stearate, with the percentage of Paris green kept constant. Freshly collected larvæ were added every day or two and the mortality was noted within the next 24 hours. These pans received one natural shower of moderate intensity, and three artificial showers from the spray nozzle of a garden hose, each of the latter of such intensity as to raise the level of the water about one-fourth inch in three minutes. The pan containing Paris green and lime was nontoxic on the third day after dusting, while all but one of the pans containing stearate went to the sixth day, or longer, before an equal lack of toxicity was shown. Certain of the lime-stearate mixtures, particularly the mixture containing 10 per cent stearate, were superior to either lime or stearate alone. (See experiment 13.)

With so few experiments it is, of course, impossible to assemble conclusive data; but from the results obtained it seems that further investigation on this subject is justified.

SUMMARY

The results of this study indicate that the stearates of calcium and aluminum, when substituted for hydrated lime in the dilution of Paris green, prolong the period from the time of dusting to the reappearance of anopheline larvæ from an average of 3 days to an average of between 5 and 6 days.

The substitution of lime for various proportions of stearate resulted in mixtures which were better than lime alone when these mixtures contained 10 per cent or more of calcium stearate.

Experiment 1

South Branch of Wares Pond.
Dust, ⅛ pound Paris green with 2⅜ pounds lime.
Area dusted, 1–1½ acres.

Date	Dusted area		Undusted area	
	Larvæ	Dips	Larvæ	Dips
July 26 (before dusting)	24	22	10	12
July 27	8	28	30	13
July 28	12	28	22	15
July 30	15	25	10	14
July 31	22	32	16	17

Experiment 1a

West Branch Wares Pond.
Dust, ½ pound Paris green with 4½ pounds calcium stearate.
Area dusted, 2–3 acres.

Date	Dusted area		Undusted area	
	Larvæ	Dips	Larvæ	Dips
July 26 (before dusting)	53	44	19	41
July 27	24	42	16	29
July 28	20	40	29	35
July 30	16	47	30	34
July 31	35	47	52	31

Experiment 2

South Branch Wares Pond.
Dust, 1 pound Paris green with 5 pounds lime.
Area dusted, about 1 acre.

Date	Dusted area		Undusted area	
	Larvæ	Dips	Larvæ	Dips
July 31 (before dusting)	14	14	8	18
Aug. 1	0	16	13	18
Aug. 2	0	10	8	12
Aug. 3	8	11	17	12
Aug. 5	4	10	4	18

Experiment 2a

West Branch Wares Pond.
Dust, 4 pounds Paris green with 16 pounds calcium stearate.
Area dusted, 4 acres.

Date	Dusted area		Undusted area	
	Larvæ	Dips	Larvæ	Dips
July 31 (before dusting)	85	78	24	35
Aug. 1	7	94	28	37
Aug. 2	6	76	25	26
Aug. 3	2	76	30	26
Aug. 4	0	101	19	17
Aug. 5	2	92	12	33
Aug. 6	10	76	------	------
Aug. 7	17	84	------	------

Experiment 3

South Branch Wares Pond.
Dust, 3 pounds Paris green with 12 pounds aluminum stearate.
Area dusted, 3 acres.

Date	Dusted area		Undusted area	
	Larvæ	Dips	Larvæ	Dips
Aug. 5 (before dusting)	43	56	4	18
Aug. 6	4	59	8	19
Aug. 7	0	57	12	17
Aug. 8	0	58	13	15
Aug. 9	2	56	[1] 3	17
Aug. 10	0	62	0	17
Aug. 11	1	63	1	19
Aug. 12	13	69	6	18
Aug. 13	6	66	3	17
Aug. 14	12	62	13	17
Aug. 15	14	72	7	20
Aug. 16	37	62	16	19

[1] Dust drifted into control area.

Experiment 4

West Branch Wares Pond.
Dust, 5 pounds Paris green with 20 pounds lime.
Area dusted, 5 acres.

Date	Larvæ	Dips	Date	Larvæ	Dips
Aug. 12 (before dusting)	59	145	Aug. 16	27	143
Aug. 13	4	43	Aug. 17	27	83
Aug. 14	6	137	Aug. 19	74	85
Aug. 15	3	124			

Experiment 5

South Branch Wares Pond.
Dust, 3 pounds Paris green with 6 pounds aluminum stearate.
Area dusted, 3 acres.

Date	Larvæ	Dips	Date	Larvæ	Dips
Aug. 16 (before dusting)	53	81	Aug. 22	15	70
Aug. 17	0	93	Aug. 23	31	72
Aug. 19	6	86	Aug. 24	16	74
Aug. 20	1	75	Aug. 26	20	68
Aug. 21	7	74			

Experiment 6

West Branch Wares Pond.
Dust, 5 pounds Paris green with 10 pounds calcium stearate.
Area dusted, 5 acres.

Date	Dusted area		Undusted area	
	Larvæ	Dips	Larvæ	Dips
Aug. 19 (before dusting)	74	85		
Aug. 19 (after dusting)	5	53	12	20
Aug. 20	0	87	8	19
Aug. 21	0	75	12	21
Aug. 22	1	76		
Aug. 23	0	80		
Aug. 24	0	79	13	17
Aug. 25	3	90		
Aug. 26	3	77	11	16
Aug. 27	3	78	14	21
Aug. 28	6	79		
Aug. 29	11	77		
Aug. 30	13	69		
Aug. 31	44	79		

Experiment 7

South Branch Wares Pond.
Dust, 3 pounds Paris green with 3 pounds calcium stearate.
Area dusted, 3–4 acres.

Date	Dusted area		Undusted area	
	Larvæ	Dips	Larvæ	Dips
Aug. 26 (before dusting)	20	70		
Aug. 26 (after dusting)	4	37	11	16
Aug. 27	0	79	14	21
Aug. 28	1	68		
Aug. 29	1	72		
Aug. 30	3	64		
Aug. 31	7	69		

Experiment 8

South Branch Wares Pond.
Dust, 1 pound Paris green with 19 pounds lime.
Area dusted, 3–4 acres.

Date	Larvæ	Dips	Date	Larvæ	Dips
Sept. 2 (before dusting)	14	73	Sept. 5	4	79
Sept. 2 (after dusting)	5	42	Sept. 6	20	84
Sept. 3	5	84	Sept. 7	16	90
Sept. 4	6	80			

Experiment 8a

West Branch Wares Pond.
Dust, 1¼ pounds Paris green, 1½ pounds calcium stearate, and 22½ pounds lime.
Area dusted, 4–5 acres.

Date	Larvæ	Dips	Date	Larvæ	Dips
Sept. 2 (before dusting)	33	93	Sept. 5	23	86
Sept. 3	7	94	Sept. 6	18	80
Sept. 4	11	86	Sept. 7	26	89

Experiment 9

Toano Hunting and Fishing Club Pond, north side.
Dust, 1 pound Paris green with 4 pounds lime.
Area dusted, 1 acre.

Date	Larvæ	Dips	Date	Larvæ	Dips
Sept. 3 (before dusting)	25	25	Sept. 6 [1]	6	30
Sept. 4	5	50	Sept. 7	4	30
Sept. 5	5	25			

[1] Conditions unfavorable for mosquito breeding because of disappearance of proper vegetation.

Experiment 9a

Toano Hunting and Fishing Club Pond.
Dust, 1 pound Paris green with ¼ pound calcium stearate and 3¾ pounds lime.
Area dusted, 1 acre.

Date	Larvæ	Dips	Date	Larvæ	Dips
Sept. 3 (before dusting)	44	25	Sept. 6	36	50
Sept. 4	4	40	Sept. 7	19	32
Sept. 5	5	25			

Experiment 10

Toano Hunting and Fishing Club Pond, south side, west of island.
Dust, 1 pound Paris green with 4 pounds lime.
Area dusted, about 1 acre.

Date	Larvæ	Dips	Date	Larvæ	Dips
Sept. 7 (before dusting)	18	20	Sept. 10	24	20
Sept. 8	0	20	Sept. 11	26	15
Sept. 9	2	30	Sept. 13	53	25

Experiment 10a

Toano Hunting and Fishing Club Pond (above island).
Dust, 2 pounds Paris green and 2 pounds calcium stearate, with 6 pounds lime.
Area dusted, about 2–3 acres.

Date	Larvæ	Dips	Date	Larvæ	Dips
Sept. 7 (before dusting)	35	52	Sept. 10	5	50
Sept. 8	0	55	Sept. 11	12	26
Sept. 9	0	55	Sept. 13	38	35

Experiment 11

West Branch Wares Pond, east side.
Dust, 3½ pound Paris green with 2⅜ pounds lime.
Area dusted, about 1 acre.

Date	Larvæ	Dips	Date	Larvæ	Dips
Sept. 9 (before dusting)	36	25	Sept. 13	15	35
Sept. 10	3	30	Sept. 14	40	20
Sept. 11	2	30	Sept. 15	21	12
Sept. 12	20	25			

Experiment 11a

West Branch Wares Pond, north side.
Dust, ½ pound Paris green and ¼ pound calcium stearate, with 1¾ pounds lime.
Area dusted, ½–1 acre.

Date	Larvæ	Dips	Date	Larvæ	Dips
Sept. 9 (before dusting)	30	25	Sept. 13	1	30
Sept. 10	0	40	Sept. 14	7	25
Sept. 11	0	35	Sept. 15	20	25
Sept. 12	10	25			

Experiment 12

West Branch Wares Pond, south side.
Dust, ½ pound Paris green with 2 pounds lime.
Area dusted, ½–1 acre.

Date	Larvæ	Dips	Date	Larvæ	Dips
Sept. 10 (before dusting)	29	28	Sept. 13	8	20
Sept. 11	0	25	Sept. 14	17	25
Sept. 12	1	20	Sept. 15	11	12

Experiment 12a

West end of West Branch Wares Pond.
Dust, ½ pound Paris green and 1 pound calcium stearate, with 1 pound lime.
Area dusted, ½–1 acre.

Date	Larvæ	Dips	Date	Larvæ	Dips
Sept. 10 (before dusting)	55	40	Sept. 13	1	30
Sept. 11	0	30	Sept. 14	4	25
Sept. 12	0	25	Sept. 15	3	30

TABLE 1.—*Period, in days, from time of dusting to the appearance of a significant and sustained increase in larvæ, when single substances were used as diluents*

Experiment No.	Paris green and lime	Paris green and calcium stearate	Paris green and aluminum stearate	Experiment No.	Paris green and lime	Paris green and calcium stearate	Paris green and aluminum stearate
1	2			8		4	
1a		5		10	3		
2	3			11	3		
2a		6		12	3		
3			7	Average period	3	5⅔	6
4	4			Number of experiments	6	5	2
5			5				
6		9					
7		4					

TABLE 1a.—*Period, in days, from time of dusting to the appearance of a significant and sustained increase in larvæ when mixtures of Paris green and calcium stearate were used as diluents*

Experiment No.	Per cent calcium stereate				Experiment No.	Per cent calcium sterate			
	5	10	20	40		5	10	20	40
8a	2				12a				6
9a	3				Average period	2.5	5	4	6
10a			4		Number of experiments	2	1	1	1
11a		5							

Experiment 13 (laboratory)—Mortality of anopheline larvæ in pans dusted with Paris green and lime, Paris green and calcium stearate, and Paris green with various combinations of lime and calcium stearate

Pan No.	Paris green	Lime	Calcium stearate	Sept. 5		Sept. 6		Sept. 7		Sept. 8	
				Exposed	Died[1]	Exposed	Died	Exposed	Died	Exposed	Died
	Per cent	*Per cent*	*Per cent*								
1	20	80	0	5	5	5	5	5	1	5	1
2	20	75	5	5	5	5	5	5	5	5	4
3	20	70	10	5	5	5	5	5	4	5	3
4	20	65	15	5	5	5	5	5	3	5	2
5	20	60	20	5	5	5	5	5	0	5	5
6	20	40	40	5	5	5	5	5	2	5	1
7	20	0	80	5	5	5	5	5	5	5	2
8	0	0	0	5	1	5	5	1	1	5	2

Pan No.	Paris green	Lime	Calcium stearate	Sept. 10		Sept. 12		Total exposed	Total died	Per cent of exposed that died
				Exposed	Died	Exposed	Died			
	Per cent	*Per cent*	*Per cent*							
1	20	80	0	10	0	10	4	40	16	40
2	20	75	5	10	3	10	6	40	28	70
3	20	70	10	10	7	10	7	40	31	77.5
4	20	65	15	10	2	10	5	40	22	55
5	20	60	20	10	0	10	4	40	19	47.5
6	20	40	40	10	1	10	5	40	19	47.5
7	20	0	80	10	0	10	5	40	22	55
8	0	0	0	9	2	10	6	39	12	25.6

[1] All observations on the numbers of larvæ that died were made within 24 hours of the time when they were put in the pans.

First artificial shower Sept. 7, before larvæ were put in pans.
Second artificial shower Sept. 8, before larvæ were put in pans.
Third artificial shower Sept. 10, before larvæ were put in pans.
Natural shower night of Sept. 10–11.

KEY CATALOGUE OF PARASITES REPORTED FOR PRIMATES (MONKEYS AND LEMURS), AND THEIR POSSIBLE PUBLIC HEALTH IMPORTANCE

Monkeys have many diseases that occur in man, and on this account they are more and more becoming objects of scientific study in public health laboratories; but public health investigators have been handicapped by the lack of a convenient classification which would assist authors in the identification of these mammals and their diseases. To supply this lack, the United States Public Health Service has recently issued a publication [1] on the classification of monkeys and of their diseases in relation to the diseases of man, prepared by Prof. C. W. Stiles of the United States Public Health Service and Dr. Albert Hassall of the United States Bureau of Animal Industry.

With the increasing knowledge of the diseases which can develop in monkeys, questions of public health importance arise in regard to the potential rôle of the menagerie, the circus, and the zoo in spreading diseases to man. This bulletin gives the desired information in regard to the apes, monkeys, and lemurs. Under the name of each of these animals there is a list of its parasitic diseases, and in the introduction under the name of each parasite there is a list of all the apes, monkeys, and lemurs for which each particular parasite has been reported and a notation as to whether the parasite is transmissible to man.

It is interesting to note that two of the hookworms reported for man are reported for apes also, and that two infections ("tongue worms") which man contracts from snakes are very widespread among the apes and monkeys.

This publication is of a technical nature and will be of interest chiefly to anatomists, bacteriologists, and zoologists. As long as the supply for free distribution lasts, the bulletin may be obtained by applying to the Surgeon General, United States Public Health Service.

THE NOTIFIABLE DISEASES

Prevalence During 1928 in Cities of Over 100,000 Population

The annual summary of the reports of notifiable diseases for 1928 in cities of the United States having more than 100,000 population will soon be issued as Supplement No. 76 to the Public Health Reports. The tables in this publication present the number of cases reported, the average or estimated expectancy based on recent years, the number

[1] Hygienic Laboratory Bulletin No. 152.

of deaths, and the case and death rates for most of the following-named communicable diseases:

Anthrax.
Chicken pox.
Dengue.
Diphtheria.
Influenza.
Lethargic encephalitis.
Malaria.
Measles.
Meningococcus meningitis.
Mumps.
Pellagra.
Pneumonia (all forms).
Poliomyelitis.
Rabies in animals.
Rabies in man.
Rocky Mountain spotted (or tick) fever.
Scarlet fever.
Septic sore throat.
Smallpox.
Tuberculosis (all forms and respiratory system).
Tularæmia.
Typhoid fever.
Typhus fever.
Undulant fever.
Whooping cough.

The following table gives a comparison of the rates for some of the principal communicable diseases in the large cities of the United States for the years 1922, 1923, 1924, 1925, 1926, 1927, and 1928:

	Cases		Deaths	
	Number of cities	Cases per 1,000 population	Number of cities	Deaths per 1,000 population
Chicken pox:				
1922	68	1.69	68	0.001
1923	77	2.02	77	.001
1924	82	2.45	82	.001
1925	69	1.89	69	.001
1926	68	2.24	68	.001
1927	73	2.46	73	.001
1928	75	2.17	75	.001
Diphtheria:				
1922	73	2.25	73	.155
1923	77	1.97	77	.132
1924	82	1.67	83	.111
1925	69	1.39	69	.100
1926	70	1.33	70	.097
1927	76	1.63	76	.108
1928	75	1.29	75	.094
Influenza:				
1922	------	------	70	.161
1923	------	------	77	.207
1924	------	------	80	.098
1925	------	------	66	.151
1926	------	------	66	.236
1927	------	------	75	.135
1928	------	------	73	.253
Lethargic encephalitis:				
1924	------	------	68	.022
1925	------	------	58	.022
1926	------	------	59	.020
1927	------	------	65	.017
1928	------	------	64	.016
Measles:				
1922	72	5.26	72	.080
1923	77	7.11	77	.076
1924	80	4.36	83	.048
1925	69	3.32	69	.032
1926	70	7.92	70	.062
1927	72	3.07	72	.020
1928	75	5.88	75	.050
Meningococcus meningitis:				
1922	41	0.03	67	0.016
1923	40	.02	64	.016
1924	39	.02	64	.015
1925	48	.02	61	.014
1926	49	.03	56	.018
1927	58	.04	64	.024
1928	65	.10	69	.049
Mumps:				
1922	66	.72	66	.0005
1923	69	.75	69	.0005
1924	75	1.66	76	.0006
1925	66	.67	66	.0006
1926	63	.76	63	.0009
1927	69	1.60	69	.0005
1928	68	1.40	68	.0006
Pellagra:				
1922	------	------	26	.009
1923	------	------	32	.011
1924	------	------	32	.009
1925	------	------	28	.009
1926	------	------	29	.012
1927	------	------	34	.019
1928	------	------	34	.019
Pneumonia (all forms):				
1922	------	------	74	1.359
1923	------	------	75	1.514
1924	------	------	83	1.347
1925	------	------	68	1.327
1926	------	------	69	1.450
1927	------	------	77	1.093
1928	------	------	75	1.386
Poliomyelitis:				
1924	66	.07	72	.010
1925	63	.05	63	.013
1926	62	.03	62	.006
1927	75	.09	77	.014
1928	66	.05	70	.012

	Cases		Deaths	
	Number of cities	Cases per 1,000 population	Number of cities	Deaths per 1,000 population
Scarlet fever:				
1922	73	1.80	73	0.033
1923	77	2.07	77	.035
1924	82	2.15	82	.027
1925	68	2.26	68	.026
1926	70	2.13	70	.024
1927	76	2.37	76	.021
1928	75	1.78	75	.018
Smallpox:				
1922	75	.17	75	.0119
1923	78	.18	78	.0014
1924	83	.50	83	.0164
1925	69	.25	69	.0139
1926	70	.16	70	.0009
1927	76	.14	76	.0003
1928	75	.09	75	.0001
Tuberculosis (all forms):				
1922	------	------	72	1.010
1923	------	------	77	.981
1924	------	------	82	.962
1925	------	------	69	.926
1926	------	------	69	.900
1927	------	------	75	.829
1928	------	------	75	.849
Tuberculosis (respiratory system):				
1922	------	------	64	0.870
1923	------	------	67	.846
1924	------	------	70	.821
1925	------	------	60	.790
1926	------	------	61	.779
1927	------	------	70	.722
1928	------	------	69	.740
Typhoid fever:				
1922	73	0.19	73	.033
1923	77	.19	77	.033
1924	81	.22	83	.034
1925	68	.21	69	.035
1926	69	.16	69	.028
1927	74	.14	76	.020
1928	73	.11	75	.020
Whooping cough:				
1923	76	1.67	76	.064
1924	77	1.56	81	.054
1925	65	1.68	68	.056
1926	67	1.92	67	.064
1927	72	1.43	77	.038
1928	71	1.70	75	.048

DEATH RATES IN A GROUP OF INSURED PERSONS

Rates for Principal Causes of Death for August, 1929

The accompanying table, taken from the Statistical Bulletin for September, 1929, issued by the Metropolitan Life Insurance Co., presents the mortality record of the industrial insurance department of the company for August and the cumulative death rates for the period January–August, inclusive, for the principal causes of death. The rates are based on a strength of approximately 19,000,000 insured persons in the United States and Canada.

The death rate among this group for August was 7.5 per 1,000. It is stated that this is the lowest rate ever recorded for any single month with the exception of two instances—August, 1924, and September, 1922. The year-to-date death rate for the period January–August was 9.7 per 1,000, as compared with 9.5 for the corresponding period of 1928. As a result of improved health conditions later in the year, the high cumulative death rate for the first two or three months, due to the influenza outbreak of last winter, has now been reduced to such an extent that it is predicted that 1929 will rank better than the average from the standpoint of health.

As compared with August of 1928, decreased mortality is shown for typhoid fever, measles, diphtheria, influenza, tuberculosis, cancer, diabetes, the three principal degenerative diseases, pneumonia, diarrheal diseases, puerperal conditions, suicides, homicides, and accidents.

Health conditions in this group of persons during the period January–August, 1929, are summarized as follows:

There has been no general epidemic prevalence of any disease, with the exception of the influenza outbreak of last winter. Diseases of major public health interest, like typhoid fever, measles, scarlet fever, diphtheria, tuberculosis, pneumonia, diarrheal diseases, and puerperal conditions, have recorded more or less lower mortality rates than in 1928. Four of the most important of these—tuberculosis, diphtheria, diarrheal complaints, and puerperal diseases—give excellent promise of registering lower mortality rates this year than ever before.

Death rates (annual basis) per 100,000 for principal causes of death, August, 1929

[Industrial department, Metropolitan Life Insurance Co.]

Cause of death	Death rate per 100,000 lives exposed *				
	August, 1929	July, 1929	August, 1928	Cumulative, January to August	
				1929	1928
Total, all causes	752.8	822.0	851.2	966.3	951.4
Typhoid fever	3.2	3.2	4.4	2.0	2.3
Measles	1.6	2.7	2.2	3.9	7.3
Scarlet fever	1.1	2.4	1.0	3.0	3.2
Whooping cough	6.3	5.8	5.5	6.2	6.1
Diphtheria	4.0	6.5	4.5	8.4	10.0
Influenza	3.8	5.2	5.6	54.6	26.4
Tuberculosis (all forms)	77.1	86.9	91.8	90.1	95.3
Tuberculosis of respiratory system	68.7	75.8	79.9	79.8	83.4
Cancer	71.2	78.5	75.5	75.9	75.4
Diabetes mellitus	14.1	15.4	15.7	19.1	18.2
Cerebral hemorrhage	45.5	53.1	52.3	58.0	58.2
Organic diseases of heart	114.7	123.4	125.0	151.4	147.0
Pneumonia (all forms)	33.7	39.3	38.2	101.3	102.3
Other respiratory diseases	9.0	8.4	11.8	12.8	14.2
Diarrhea and enteritis	30.9	20.4	41.3	17.0	20.8
Bright's disease (chronic nephritis)	58.7	62.4	61.4	70.5	72.4
Puerperal state	11.4	14.4	14.6	13.8	14.4
Suicides	6.9	7.9	8.4	8.4	8.4
Homicides	6.4	6.1	6.7	6.2	6.4
Other external causes (excluding suicides and homicides)	70.2	79.0	82.6	62.6	62.3
Traumatism by automobiles	22.1	22.6	23.0	18.2	16.5
All other causes	183.0	201.2	202.7	201.0	200.7

* All figures include infants insured under 1 year of age.

DEATHS DURING WEEK ENDED OCTOBER 12, 1929

Summary of information received by telegraph from industrial insurance companies for the week ended October 12, 1929, and corresponding week of 1928. (From the Weekly Health Index, October 16, 1929, issued by the Bureau of the Census, Department of Commerce)

	Week ended Oct. 12, 1929	Corresponding week, 1928
Policies in force	74, 892, 526	71, 904, 090
Number of death claims	11, 494	10, 382
Death claims per 1,000 policies in force, annual rate	8.0	7.5

Deaths from all causes in certain large cities of the United States during the week ended October 12, 1929, infant mortality, annual death rate, and comparison with corresponding week of 1928. (From the Weekly Health Index, October 16, 1929, issued by the Bureau of the Census, Department of Commerce)

City	Week ended Oct. 12, 1929		Annual death rate per 1,000 corresponding week, 1928	Deaths under 1 year		Infant mortality rate, week ended Oct. 12, 1929 [3]
	Total deaths	Death rate [1]		Week ended Oct. 12, 1929	Corresponding week, 1928	
Total (64 cities)	6,232	11.2	11.4	601	639	[3] 55
Akron	41			6	4	62
Albany [4]	39	16.9	14.8	5	2	99
Atlanta	84	17.2	11.9	9	11	93
White	42			7	5	
Colored	42	(5)	(5)	2	6	
Baltimore [4]	193	12.2	11.6	18	21	58
White	137			11	21	44
Colored	56	(5)	(5)	7	0	111
Birmingham	56	13.2	10.6	12	4	109
White	21			3	3	45
Colored	35	(5)	(5)	9	1	206
Boston	213	13.9	14.3	23	23	64
Bridgeport	39			8	2	138
Buffalo	116	10.9	12.0	9	13	39
Cambridge	20	8.3	11.2	0	4	0
Camden	25	9.7	10.8	2	3	35
Canton	6	2.7	8.1	1	2	24
Chicago [4]	618	10.2	10.4	45	65	40
Cincinnati	127			8	9	47
Cleveland	197	10.2	9.9	7	20	21
Columbus	71	12.4	11.9	6	4	56
Dallas	41	9.8	10.1	2	5	
White	32			2	5	
Colored	9	(5)	(5)	0	0	
Dayton	38	10.8	11.6	5	3	79
Denver	83	14.8	13.7	4	5	39
Des Moines	26	8.9	12.7	3	0	54
Detroit	268	10.2	9.5	48	26	77
Duluth	19	8.5	10.7	1	1	24
El Paso	37	16.4	12.9	7	5	
Erie	23			3	4	61
Fall River [4]	26	10.1	7.4	2	2	38
Flint	38	13.4	13.4	10	10	121
Fort Worth	21	6.4	9.5	2	3	
White	19			2	2	
Colored	2	(5)	(5)	0	1	
Grand Rapids	32	10.2	11.1	2	5	30
Houston	53			4	3	
White	35			2	3	
Colored	18	(5)	(5)	2	0	
Indianapolis	90	12.3	12.9	10	7	80
White	72			8	6	74
Colored	18	(5)	(5)	2	1	119
Jersey City	58	9.3	11.6	3	3	23
Kansas City, Kans	22	9.7	18.6	3	1	66
White	14			3	1	76
Colored	8	(5)	(5)	0	0	0
Kansas City, Mo	78	10.4	14.2	4	8	34
Knoxville	42	20.8	17.9	6	4	131
White	34			6	4	146
Colored	8	(5)	(5)	0	0	0
Los Angeles	275			19	15	56
Louisville	65	10.3	11.7	9	3	73
White	54			8	3	74
Colored	11	(5)	(5)	1	0	63
Lowell	21			6	3	136
Lynn	12	5.9	10.4	0	1	0
Memphis	70	19.2	16.5	10	10	118
White	32			7	2	132
Colored	38	(5)	(5)	3	8	94
Milwaukee	112	10.8	10.9	19	20	83
Minneapolis	78	8.9	9.5	7	2	43
Nashville	40	15.0	15.4	12	8	194
White	23			9	4	196
Colored	17	(5)	(5)	3	4	189
New Bedford	19			2	1	43
New Haven	39	10.9	9.2	4	3	61

Footnotes at end of table.

Deaths from all causes in certain large cities of the United States during the week ended October 12, 1929, infant mortality, annual death rate, and comparison with corresponding week of 1928—Continued

City	Week ended Oct. 12, 1929		Annual death rate per 1,000 corresponding week, 1928	Deaths under 1 year		Infant mortality rate, week ended Oct. 12, 1929
	Total deaths	Death rate		Week ended Oct. 12, 1929	Corresponding week, 1929	
New Orleans	139	16.9	17.2	12	19	60
White	82			7	11	49
Colored	57	(5)	(5)	5	8	84
New York	1,302	11.3	11.0	111	120	45
Bronx Borough	175	9.6	7.9	15	14	44
Brooklyn Borough	433	9.8	9.4	39	57	40
Manhattan Borough	530	15.8	16.9	43	39	53
Queens Borough	126	7.7	6.8	11	10	45
Richmond Borough	38	13.2	11.1	3	0	54
Newark, N. J	84	9.3	12.7	10	16	53
Oakland	55	10.5	13.4	2	5	22
Oklahoma City	33			4	2	80
Omaha	50	11.7	13.8	7	7	82
Paterson	26	9.4	12.3	1	3	18
Philadelphia	424	10.7	10.8	31	36	44
Pittsburgh	152	11.8	12.2	20	18	69
Portland, Oreg	56			3	1	34
Providence	66	12.1	9.5	5	6	44
Richmond	44	11.8	15.6	5	5	70
White	20			1	2	21
Colored	24	(5)	(5)	4	3	164
Rochester	63	10.0	9.9	8	9	68
St. Paul	45			1	2	10
Salt Lake City [4]	26	9.9	15.2	2	5	31
San Antonio	60	14.4	13.2	5	13	
San Diego	35			1	1	19
San Francisco	146	13.0	10.3	8	6	51
Schenectady	22	12.3	10.1	1	3	32
Seattle	85	11.6	9.7	3	4	32
Somerville	14	7.1	9.7	1	0	36
Spokane	20	9.6	18.7	1	5	26
Springfield, Mass	27	9.4	11.5	2	1	33
Syracuse	40	10.5	12.6	4	6	48
Tacoma	20	9.5	9.0	2	0	51
Toledo	65	10.9	10.5	11	10	103
Trenton	35	13.2	13.9	7	6	127
Utica	33	16.6	15.6	2	2	51
Washington, D. C	142	13.5	9.9	12	13	70
White	81			3	5	25
Colored	61	(5)	(5)	9	8	170
Waterbury	20			3	4	76
Wilmington, Del	21	8.5	11.0	7	6	182
Worcester	41	10.8	19.8	4	4	50
Yonkers	20	8.6	10.8	1	1	23
Youngstown	37	11.1	11.1	6	3	86

[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 72 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.

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 October 12, 1929, and October 13, 1928

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended October 12, 1929, and October 13, 1928

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Oct. 12, 1929	Week ended Oct. 13, 1928	Week ended Oct. 12, 1929	Week ended Oct. 13, 1928	Week ended Oct. 12, 1929	Week ended Oct. 13, 1928	Week ended Oct. 12, 1929	Week ended Oct. 13, 1928
New England States:								
Maine	4	4	----	----	4	26	0	0
New Hampshire	2	----	----	11	14	4	0	0
Vermont	2	1	----	----	----	2	0	0
Massachusetts	61	66	6	6	22	85	2	3
Rhode Island	12	12	2	----	----	4	2	0
Connecticut	15	21	34	3	----	27	0	0
Middle Atlantic States:								
New York	115	150	[1] 14	[1] 10	66	155	5	15
New Jersey	96	95	3	9	8	30	2	3
Pennsylvania	139	168	----	----	156	193	14	6
East North Central States:								
Ohio	90	92	23	24	113	67	4	5
Indiana	33	73	----	18	2	11	0	0
Illinois	131	124	10	10	93	69	7	5
Michigan	92	85	3	----	73	26	14	8
Wisconsin	24	23	16	54	78	27	3	5
West North Central States:								
Minnesota	22	20	1	1	15	36	1	4
Iowa	4	17	1	----	11	----	1	0
Missouri	54	53	4	4	17	8	5	6
North Dakota	----	14	----	----	5	1	2	0
South Dakota	8	----	----	----	----	----	0	0
Nebraska	2	26	2	----	25	20	1	1
Kansas	33	31	1	2	36	4	1	0
South Atlantic States:								
Delaware	----	1	----	----	----	3	0	0
Maryland [2]	25	37	8	8	4	9	0	1
District of Columbia	9	26	----	----	1	4	0	0
Virginia	----	----	----	----	----	----	----	----
West Virginia	31	17	20	15	3	10	0	1
North Carolina	245	208	----	----	4	15	5	0
South Carolina	81	95	377	591	----	----	0	0
Georgia	35	62	60	112	2	2	0	0
Florida	15	12	----	5	1	3	0	0

[1] New York City only.

[2] Week ended Friday.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended October 12, 1929, and October 13, 1928—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Oct. 12, 1929	Week ended Oct. 13, 1928	Week ended Oct. 12, 1929	Week ended Oct. 13, 1928	Week ended Oct. 12, 1929	Week ended Oct. 13, 1928	Week ended Oct. 12, 1929	Week ended Oct. 13, 1928
East South Central States:								
Kentucky	24	33					1	0
Tennessee	64	69	10	27	2	1	0	0
Alabama	89	99	23	39	11	6	1	0
Mississippi	81	54					1	1
West South Central States:								
Arkansas	16	40	41	28		2	0	0
Louisiana	31	24	16	9		6	3	0
Oklahoma [3]	56	88	38	35	10	2	0	1
Texas	91	39	21	34	2		1	0
Mountain States:								
Montana	2	3		6	198	8	2	2
Idaho					2	1	2	2
Wyoming	1	3			1		0	1
Colorado	5	25			3	2	0	0
New Mexico	5	5				1	0	0
Arizona	11	5			2	7	0	0
Utah [2]				4	1	1	4	5
Pacific States:								
Washington	8	3	2		12	18	4	0
Oregon	11	13	15	5	5	13	2	2
California	52	66	26	34	41	11	4	4

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Oct. 12, 1929	Week ended Oct. 13, 1928	Week ended Oct. 12, 1929	Week ended Oct. 13, 1928	Week ended Oct. 12, 1929	Week ended Oct. 13, 1928	Week ended Oct. 12, 1929	Week ended Oct. 13, 1928
New England States:								
Maine	0	2	46	30	0	4	4	2
New Hampshire	0	1	25	7	0	0	3	0
Vermont	4	1	6	1	7	0	0	0
Massachusetts	10	9	100	104	0	0	9	8
Rhode Island	1	1	6	11	0	0	0	1
Connecticut	0	4	22	22	0	0	4	6
Middle Atlantic States:								
New York	27	39	70	132	9	0	33	129
New Jersey	3	1	40	44	0	0	10	9
Pennsylvania	18	5	142	173	0	0	44	53
East North Central States:								
Ohio	12	12	163	157	18	14	26	42
Indiana	0	0	38	72	21	9	10	15
Illinois	5	3	241	175	62	5	34	40
Michigan	17	2	113	134	25	14	8	9
Wisconsin	0	0	30	99	5	5	27	2
West North Central States:								
Minnesota	3	10	63	67	1	2	3	3
Iowa	4	1	43	62	23	6	2	4
Missouri	0	1	51	101	4	2	12	17
North Dakota	0	8	19	28	5	1	3	1
South Dakota	0	4	4	16	7	0	0	0
Nebraska	0	1	17	51	7	0	1	2
Kansas	2	2	63	89	1	10	7	11
South Atlantic States:								
Delaware	0	0	4	1	0	0	0	6
Maryland [2]	0	10	45	37	0	0	28	38
District of Columbia	0	3	7	12	0	0	1	1
Virginia	17							
West Virginia	3	14	34	48	3	0	35	38
North Carolina	2	1	116	129	6	6	14	43
South Carolina	6	5	29	19	0	0	23	52
Georgia	1	1	44	37	0	0	33	18
Florida	0	1	9	10	0	0	0	6

[2] Week ended Friday.
[3] Figures for 1929 are exclusive of Oklahoma City and Tulsa, and for 1928 are exclusive of Tulsa only.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended October 12, 1929, and October 13, 1928—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Oct. 12, 1929	Week ended Oct. 13, 1928	Week ended Oct. 12, 1929	Week ended Oct. 13, 1928	Week ended Oct. 12, 1929	Week ended Oct. 13, 1928	Week ended Oct. 12, 1929	Week ended Oct. 13, 1928
East South Central States:								
Kentucky	0	1	30	87	3	0	23	41
Tennessee	3	0	46	39	0	1	19	62
Alabama	1	5	70	48	0	0	10	36
Mississippi	0	0	30	30	0	0	22	18
West South Central States:								
Arkansas	0	1	13	16	1	1	38	11
Louisiana	0	0	22	9	0	0	24	22
Oklahoma[3]	0	0	38	38	7	3	31	40
Texas	1	1	28	18	20	1	10	18
Mountain States:								
Montana	0	4	3	7	9	8	37	9
Idaho	0	4	1	10	1	2	0	0
Wyoming	0	1	2	11	0	1	0	0
Colorado	0	2	15	15	9	11	5	12
New Mexico	0	0	----	8	0	0	23	18
Arizona	0	0	2	1	0	0	2	7
Utah[3]	1	0	9	9	1	0	4	1
Pacific States:								
Washington	1	15	20	31	17	9	14	10
Oregon	2	3	11	24	1	21	7	5
California	4	2	137	93	16	31	15	14

[2] Week ended Friday.
[3] Figures for 1929 are exclusive of Oklahoma City and Tulsa, and for 1928 are exclusive of Tulsa only.

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
September, 1929										
Arizona	11	14	----	----	5	----	1	10	5	11
New Hampshire	----	9	3	----	----	----	1	24	----	2
New Jersey	17	268	6	----	42	----	14	132	0	58
Ohio	12	174	38	9	137	----	33	443	80	173
Tennessee	10	202	59	754	10	18	20	157	5	272
Vermont	----	6	----	----	17	----	7	14	1	5

September, 1929

Anthrax:	Cases
Ohio	1
Chicken pox:	
Arizona	1
New Jersey	54
Ohio	188
Tennessee	6
Vermont	21
Diarrhea and enteritis (under 2 years):	
Ohio	99
Dysentery:	
New Jersey	11
Ohio	4
Tennessee	33
Food poisoning:	
Ohio	11
German measles:	
New Jersey	10
Ohio	8
Hookworm disease:	
Tennessee	1
Lead poisoning:	
New Jersey	5
Ohio	8
Lethargic encephalitis:	
Ohio	6
Tennessee	1
Mumps:	
Arizona	9
Ohio	57
Tennessee	4

Ophthalmia neonatorum:	Cases
New Jersey	9
Ohio	88
Paratyphoid fever:	
Ohio	5
Tennessee	1
Puerperal septicemia:	
Ohio	4
Septic sore throat:	
Ohio	33
Tetanus:	
Ohio	4
Tennessee	2
Trachoma:	Cases
Arizona	18
New Jersey	4
Ohio	7
Undulant fever:	
Arizona	1
Ohio	10
Whooping cough:	
Arizona	20
New Jersey	508
Ohio	692
Tennessee	101
Vermont	78

ADMISSIONS TO HOSPITALS FOR THE INSANE, DECEMBER, 1928

Reports for the month of December, 1928, showing new admissions to hospitals for the care and treatment of the insane, have been received by the Public Health Service from 94 institutions located in 33 States, the District of Columbia, and the Territory of Hawaii. These hospitals reported a total of 137,886 patients on December 31, 1928, including those on parole.

The following table shows the number of new admissions for the month of December, 1928, by psychoses:

Psychoses	Number of first admissions		
	Male	Female	Total
1. Traumatic psychoses	19	7	26
2. Senile psychoses	100	75	175
3. Psychoses with cerebral arteriosclerosis	164	62	226
4. General paralysis	128	36	164
5. Psychoses with cerebral syphilis	22	12	34
6. Psychoses with Huntington's chorea	0	0	0
7. Psychoses with brain tumor	0	0	0
8. Psychoses with other brain or nervous disease	23	8	31
9. Alcoholic psychoses	151	12	163
10. Psychoses due to drugs and other exogenous toxins	11	5	16
11. Psychoses with pellagra	6	17	23
12. Psychoses with other somatic diseases	37	42	79
13. Manic-depressive psychoses	113	172	285
14. Involution melancholia	13	29	42
15. Dementia præcox (schizophrenia)	249	192	441
16. Paranoia and paranoid conditions	28	23	51
17. Epileptic psychoses	37	19	56
18. Psychoneuroses and neuroses	16	20	36
19. Psychoses with psychopathic personality	18	6	24
20. Psychoses with mental deficiency	46	30	76
21. Undiagnosed psychoses	90	65	155
22. Without psychosis	150	42	192
Total	1,421	874	2,295

Sixty-one and nine-tenths per cent of the new admissions were males and 38.1 per cent were females, giving a ratio of 163 males per 100 females. The 94 institutions on December 31, 1928, had 73,354 male patients and 64,532 female patients, the ratio being 114 males per 100 females.

At the end of the month 6,933 of the male patients and 5,819 of the female patients were on parole or otherwise absent from the hospital. The percentages of the total patients so absent were as follows: Males, 9.5 per cent; females, 9.0 per cent; total, 9.2 per cent.

Cases of dementia præcox constituted 19.2 per cent of the first admissions; manic-depressive psychoses, 12.4 per cent; psychoses with cerebral arteriosclerosis, 9.8 per cent; without psychosis, 8.4 per cent; senile psychoses, 7.6 per cent; general paralysis, 7.1 per cent; alcoholic psychoses, 7.1 per cent, and undiagnosed psychoses, 6.8 per cent.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 96 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 31,515,000. The estimated population of the 90 cities reporting deaths is more than 29,980,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended October 5, 1929, and October 6, 1928

	1929	1928	Estimated expectancy
Cases reported			
Diphtheria:			
46 States	1,779	1,877	----------
96 cities	587	589	851
Measles:			
45 States	793	779	----------
96 cities	98	164	----------
Meningococcus meningitis:			
45 States	101	83	----------
96 cities	52	58	----------
Poliomyelitis:			
47 States	143	202	----------
Scarlet fever:			
46 States	1,952	2,094	----------
96 cities	619	575	705
Smallpox:			
46 States	277	146	----------
96 cities	39	16	13
Typhoid fever:			
46 States	775	1,041	----------
96 cities	89	145	158
Deaths reported			
Influenza and pneumonia:			
90 cities	481	533	----------
Smallpox:			
90 cities	0	0	----------

City reports for week ended October 5, 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	4	0	0	-------	0	0	4	2
New Hampshire:									
Concord	(1)	0	0	1	-------	0	0	0	0
Manchester	85,700	0	3	0	-------	0	0	0	3
Nashua	(1)	0	0	0	-------	0	0	0	2
Vermont:									
Barre	(1)	2	0	0	-------	0	0	0	0
Massachusetts:									
Boston	799,200	9	32	15	1	1	5	5	5
Fall River	134,300	0	4	8	-------	0	0	0	1
Springfield	149,800	8	3	9	-------	0	0	0	0
Worcester	197,600	7	5	0	1	0	7	0	1
Rhode Island:									
Pawtucket	73,100	0	1	0	-------	0	0	0	3
Providence	286,300	0	6	5	-------	1	2	0	1
Connecticut:									
Bridgeport	(1)	2	6	1	-------	0	0	0	2
Hartford	172,300	1	4	0	-------	0	0	0	1
New Haven	187,900	4	1	0	1	0	1	1	0
MIDDLE ATLANTIC									
New York:									
Buffalo	555,800	6	13	19	-------	0	1	3	14
New York	6,017,500	20	115	66	1	6	6	16	115
Rochester	328,200	0	6	3	-------	0	1	0	2
Syracuse	199,300	0	5	0	-------	0	0	6	3
New Jersey:									
Camden	135,400	1	5	1	1	0	0	0	2
Newark	473,600	7	11	21	2	0	2	9	6
Trenton	139,000	0	2	0	-------	0	0	0	2
Pennsylvania:									
Philadelphia	2,064,200	7	45	7	6	6	1	8	30
Pittsburgh	673,800	18	21	9	1	2	12	1	17
Reading	115,400	0	1	2	-------	0	1	1	1
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	413,700	2	10	4	-------	1	1	0	6
Cleveland	1,010,300	20	42	13	1	0	0	4	16
Columbus	299,000	8	5	7	1	2	2	0	0
Toledo	313,200	3	10	1	1	1	8	1	2
Indiana:									
Fort Wayne	105,300	0	3	0	-------	0	0	0	1
Indianapolis	382,100	16	13	4	-------	0	2	4	11
South Bend	86,100	2	2	0	-------	0	0	0	0
Terre Haute	73,500	0	1	0	-------	0	0	0	1
Illinois:									
Chicago	3,157,400	33	68	111	5	1	4	4	31
Springfield	67,200	2	1	0	-------	0	0	2	0
Michigan:									
Detroit	1,378,900	27	53	52	3	2	5	14	19
Flint	148,800	2	6	2	-------	0	-------	1	1
Grand Rapids	164,200	4	2	0	-------	1	0	0	2

[1] No estimate of population made.

City reports for week ended October 5, 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—contd.									
Wisconsin:									
Kenosha	56,500	1	1	0		0	0	0	0
Madison	50,500	0	1	0		0	0	1	0
Milwaukee	544,200	25	12	2	1	1	1	9	7
Racine	74,400	1	2	0		0	0	0	0
Superior	(1)	3	1	0		0	4	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	116,800	1	2	0		0	0	1	4
Minneapolis	455,900	15	25	2		1	0	4	9
St. Paul	(1)	2	14	1		0	1	3	4
Iowa:									
Davenport	(1)	0	1	1			0	0	
Des Moines	151,900	0	5	0			0	0	
Sioux City	80,000	0	2	1			0	0	
Waterloo	37,100		0						
Missouri:									
Kansas City	391,000	7	7	3		1	0	0	9
St. Joseph	78,500	1	1	0		0	1	0	2
St. Louis	848,100	1	35	29			0	0	
North Dakota:									
Fargo	(1)	0	0	0		0	0	0	0
Grand Forks	(1)	2	0	0			0	0	
South Dakota:									
Aberdeen	(1)	0	0	0			0	0	
Sioux Falls	(1)	0	0	0			0	0	
Nebraska:									
Omaha	222,800	5	14	13		0	0	1	6
Kansas:									
Topeka	62,800	6	1	0		0	1	3	2
Wichita	99,300	4	3	6		0	0	2	0
SOUTH ATLANTIC									
Delaware:									
Wilmington	128,500	0	2	0		0	0	0	0
Maryland:									
Baltimore	830,400	6	21	5	2	1	0	2	14
Cumberland	(1)	0	1	0		0	0	0	[2]1
Frederick	(1)	0	0	0		0	0	0	0
District of Columbia:									
Washington	552,000	2	12	11	2	0	4	0	8
Virginia:									
Lynchburg	38,600	1	3	2		0	0	3	1
Norfolk	184,200	0	2	4		0	0	4	1
Richmond	194,400	1	22	26		0	0	0	4
Roanoke	64,600	0	7	3		0	0	0	1
West Virginia:									
Charleston	55,200	1	1	4		0	0	0	0
Wheeling	(1)	0	1	2		0	0	0	3
North Carolina:									
Raleigh	(1)	0	5	2		0	0	0	0
Wilmington	39,100	0	1	4		0	0	0	1
Winston-Salem	80,000	0	4	4		0	0	0	0
South Carolina:									
Charleston	75,900	0	2	0	17	0	0	0	1
Columbia	50,600	0	1	0		0	0	2	1
Georgia:									
Atlanta	255,100	0	8	3	14	3	1	0	4
Brunswick	(1)	0	0	0		0	0	1	1
Savannah	99,900	0	2	2	8	0	0	0	0
Florida:									
Miami	156,700	0	2	2		0	2	4	1
Tampa	113,400	0	2	1		0	1	6	3

[1] No estimate of population made.

[2] Nonresident.

City reports for week ended October 5, 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	0	1	2		0	0	0	3
Tennessee:									
Memphis	190,200	1	6	11		0	0	0	0
Nashville	139,600	1	6	4		0	0	0	0
Alabama:									
Birmingham	222,400	0	5	4	3	0	0	0	1
Mobile	69,600	0	1	1		0	0	0	0
Montgomery	63,100	0	3	1			0	0	
WEST SOUTH CENTRAL									
Arkansas:									
Fort Smith	(1)	0	2	2			0	0	
Little Rock	79,200	0	1	0		0	0	0	1
Louisiana:									
New Orleans	429,400	0	9	7	4	4	0	0	8
Shreveport	81,300	1	1	2		0	0	0	3
Oklahoma:									
Oklahoma City	(1)	0	3	7		0	0	0	10
Tulsa	170,500	0	3	8			0	1	
Texas:									
Dallas	217,800	0	11	26		0	0	0	2
Fort Worth	170,600	0	4	3		0	0	0	3
Galveston	50,600	0	0	0		0	0	0	1
Houston	(1)	0	5	13		0	0	0	10
San Antonio	218,100	0	2	2		0	0	0	4
MOUNTAIN									
Montana:									
Billings	(1)	0	0	0		0	0	1	2
Great Falls	(1)	3	0	0		0	0	5	1
Helena	(1)		0						
Missoula	(1)	2	0	0		0	0	0	1
Idaho:									
Boise	(1)	0	0	0		0	0	0	1
Colorado:									
Denver	294,200	9	18	1		0	2	2	4
Pueblo	44,200	0	2	0		0	0	0	1
New Mexico:									
Albuquerque	(1)	0	1	0		0	0	0	0
Utah:									
Salt Lake City	138,000	8	4	2		0	2	19	3
Nevada:									
Reno	(1)	0	0	0		0	0	0	1
PACIFIC									
Washington:									
Seattle	383,200	18	5	0			1	6	
Spokane	109,100	4	3	2			0	0	
Tacoma	110,500	11	3	2		1	0	1	4
Oregon:									
Salem	(1)	3	0	0		0	0	2	0
California:									
Los Angeles	(1)	8	36	12	12	1	3	8	7
Sacramento	75,700	1	3	2		0	3	10	1
San Francisco	585,300	31	17	5	3	1	20	14	3

[1] No estimate of population made.

City reports for week ended October 5, 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	1	4	0	0	0	0	1	0	0	4	17
New Hampshire:											
Concord	1	0	0	0	0	0	0	0	0	0	5
Manchester	1	0	0	0	0	1	0	0	0	0	24
Nashua	0	0	0	0	0	0	0	0	0	0	9
Vermont:											
Barre	0	0	0	0	0	1	0	0	0	0	4
Massachusetts:											
Boston	26	39	0	0	0	5	3	3	1	24	165
Fall River	1	4	0	0	0	3	1	0	0	0	22
Springfield	4	2	0	0	0	1	0	1	0	2	33
Worcester	7	4	0	0	0	2	0	0	0	7	38
Rhode Island:											
Pawtucket	0	2	0	0	0	0	0	0	0	0	16
Providence	3	2	0	0	0	3	1	0	0	1	46
Connecticut:											
Bridgeport	3	1	0	0	0	2	0	0	0	0	29
Hartford	2	0	0	0	0	0	1	0	0	0	27
New Haven	2	2	0	0	0	0	1	1	0	5	42
MIDDLE ATLANTIC											
New York:											
Buffalo	9	12	0	0	0	8	2	0	1	7	133
New York	49	28	0	0	0	87	32	25	3	26	1,239
Rochester	3	2	1	0	0	4	1	0	0	4	----
Syracuse	4	2	0	0	0	0	1	1	0	13	36
New Jersey:											
Camden	2	0	0	0	0	2	1	0	0	1	27
Newark	6	8	0	0	0	4	2	0	1	39	95
Trenton	1	0	0	0	0	1	0	1	1	1	42
Pennsylvania:											
Philadelphia	34	34	0	0	0	27	12	1	1	40	417
Pittsburgh	24	14	0	0	0	3	2	1	0	16	178
Reading	1	0	0	0	0	0	0	0	0	1	24
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	8	18	1	0	0	9	2	7	1	3	144
Cleveland	19	13	0	0	0	11	2	0	0	20	163
Columbus	6	3	0	0	0	6	1	1	0	0	71
Toledo	7	4	0	0	0	3	0	1	0	2	63
Indiana:											
Fort Wayne	1	1	0	1	0	0	1	0	0	0	15
Indianapolis	7	7	1	0	0	2	2	0	0	17	84
South Bend	1	0	0	0	0	0	0	0	0	0	6
Terre Haute	1	0	0	0	0	0	0	1	0	0	13
Illinois:											
Chicago	52	126	0	7	0	51	7	0	0	94	623
Springfield	2	1	0	0	0	0	1	0	0	2	12
Michigan:											
Detroit	43	39	1	1	0	17	4	4	0	55	268
Flint	8	4	0	2	0	1	0	0	0	0	34
Grand Rapids	5	7	0	0	0	0	1	2	0	10	29
Wisconsin:											
Kenosha	1	2	0	0	0	0	1	0	0	1	6
Madison	1	0	0	0	0	0	0	1	0	1	----
Milwaukee	16	9	1	0	0	9	1	3	0	41	94
Racine	3	2	0	0	0	2	0	1	0	1	17
Superior	2	2	0	0	0	0	1	0	0	4	8
WEST NORTH CENTRAL											
Minnesota:											
Duluth	6	2	0	0	0	0	1	0	0	6	28
Minneapolis	30	8	0	0	0	7	1	0	1	5	73
St. Paul	13	12	1	0	0	5	1	2	1	5	47

City reports for week ended October 5, 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—contd.											
Iowa:											
Davenport	1	2	0	0	----	----	0	0	----	0	----
Des Moines	5	8	0	1	----	----	0	0	----	0	34
Sioux City	1	0	0	0	----	----	0	0	----	2	----
Waterloo	1	----	0	----	----	----	0	----	----	----	----
Missouri:											
Kansas City	9	11	0	0	0	4	3	1	0	1	88
St. Joseph	3	0	0	0	0	0	0	0	0	1	15
St. Louis	20	9	0	0	0	12	5	5	0	11	197
North Dakota:											
Fargo	2	2	0	0	0	0	0	0	0	1	9
Grand Forks	0	0	0	1	----	----	0	0	----	0	----
South Dakota:											
Aberdeen	1	0	0	0	----	----	0	0	----	6	----
Sioux Falls	1	0	0	2	----	----	0	0	----	0	4
Nebraska:											
Omaha	3	1	0	0	0	1	0	0	0	0	43
Kansas:											
Topeka	3	10	0	0	0	2	0	0	0	0	12
Wichita	3	7	0	0	0	0	1	0	0	0	24
SOUTH ATLANTIC											
Delaware:											
Wilmington	2	1	0	0	0	0	1	1	0	0	19
Maryland:											
Baltimore	9	20	0	0	0	12	9	2	0	19	189
Cumberland	1	1	0	0	0	0	0	1	0	0	8
Frederick	1	0	0	0	0	0	0	0	0	0	1
District of Columbia:											
Washington	10	10	0	0	0	8	3	1	0	7	125
Virginia:											
Lynchburg	1	0	0	0	0	1	1	3	0	15	9
Norfolk	1	2	0	0	0	1	0	2	0	0	----
Richmond	6	4	0	0	0	1	1	1	0	4	40
Roanoke	3	5	0	0	0	0	1	0	0	0	15
West Virginia:											
Charleston	2	0	0	0	0	3	1	0	0	0	25
Wheeling	4	1	0	0	0	0	1	1	0	1	17
North Carolina:											
Raleigh	2	0	0	0	0	3	1	0	0	0	16
Wilmington	0	4	0	0	0	0	0	0	0	0	13
Winston-Salem	3	3	0	0	0	2	1	1	1	7	18
South Carolina:											
Charleston	1	2	0	0	0	2	2	0	0	0	16
Columbia	1	0	0	0	0	0	1	2	0	1	11
Georgia:											
Atlanta	6	10	1	0	0	4	2	1	0	3	71
Brunswick	0	0	0	0	0	0	0	0	0	0	6
Savannah	0	2	0	0	0	0	1	2	0	2	29
Florida:											
Miami	0	0	0	0	0	2	0	0	0	0	17
Tampa	0	1	0	0	0	0	0	0	0	0	23
EAST SOUTH CENTRAL											
Kentucky:											
Covington	1	0	0	0	0	0	0	0	0	0	19
Tennessee:											
Memphis	3	0	0	7	0	3	4	1	1	9	58
Nashville	2	4	0	0	0	2	3	0	0	1	39
Alabama:											
Birmingham	5	6	0	0	0	5	2	2	1	5	61
Mobile	1	1	0	0	0	2	0	0	1	3	15
Montgomery	1	1	0	0	----	----	0	0	----	5	----

City reports for week ended October 5, 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	1	0	0			0	0		0	
Little Rock	1	2	0	0	0	2	1	0	0	0	
Louisiana:											
New Orleans	3	6	0	0	0	12	4	1	0	1	141
Shreveport	1	4	0	0	0	2	1	0	0	0	27
Oklahoma:											
Oklahoma City	2	2	0	2	0	0	2	2	0	0	43
Tulsa	2	3	0	0			1	0		1	
Texas:											
Dallas	4	4	0	0	0	1	2	0	0	1	51
Fort Worth	1	3	0	0	0	0	0	0	0	1	32
Galveston	0	0	0	0	0	0	1	0	0	0	7
Houston	1	1	0	0	0	8	0	1	0	0	68
San Antonio	1	1	0	0	0	6	1	0	0	0	52
MOUNTAIN											
Montana:											
Billings	0	0	0	0	0	0	0	0	0	0	8
Great Falls	1	5	0	0	0	0	1	1	0	1	10
Helena	0		1				0				
Missoula	0	0	0	5	0	0	0	0	1	3	4
Idaho:											
Boise	0	0	0	0	0	1	0	0	0	0	7
Colorado:											
Denver	6	2	0	0	0	5	2	0	0	2	59
Pueblo	0	0	0	0	0	1	2	0	0	0	15
New Mexico:											
Albuquerque	1	1	0	0	0	7	2	2	0	0	11
Utah:											
Salt Lake City	2	8	1	1	0	1	3	2	0	2	35
Nevada:											
Reno	0	0	0	0	0	0	0	0	0	0	5
PACIFIC											
Washington:											
Seattle	5	11	0	5			1	0		6	
Spokane	5	3	1	0			1	0		2	
Tacoma	2	9	1	5	0	0	1	1	0	7	33
Oregon:											
Salem	0	0	0	0	0	0	2	0	0	0	
California:											
Los Angeles	13	16	2	0	0	14	3	2	1	18	210
Sacramento	2	5	0	0	0	1	1	1	0	0	21
San Francisco	8	9	1	5	0	4	1	0	0	11	143

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases, estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston	0	0	1	0	0	0	3	0	0
Rhode Island:									
Providence	0	0	0	0	0	0	1	1	0
Connecticut:									
Hartford	0	0	0	0	0	0	0	1	0

City reports for week ended October 5, 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									
New York:									
Buffalo	0	0	0	0	0	0	0	12	1
New York	10	1	4	0	0	0	19	0	0
Rochester	0	0	0	0	0	0	0	1	0
New Jersey:									
Newark	0	0	0	0	0	0	0	3	0
Trenton	0	0	0	0	0	0	1	1	0
Pennsylvania:									
Philadelphia	7	2	0	0	0	0	1	8	2
Pittsburgh	3	1	0	0	0	0	0	1	0
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	0	0	0	0	0	0	1	3	0
Cleveland	2	1	0	0	0	2	1	0	0
Toledo	0	0	1	0	0	0	1	1	0
Indiana:									
Indianapolis	0	3	0	0	0	0	0	0	0
Illinois:									
Chicago	4	1	0	0	0	0	4	2	1
Michigan:									
Detroit	5	3	0	0	0	0	2	8	1
Flint	5	1	0	0	0	0	0	1	0
Wisconsin:									
Madison	1	0	0	0	0	0	0	0	0
Milwaukee	1	0	0	0	0	0	0	0	0
Racine	1	1	0	0	0	0	0	0	0
Superior	0	1	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Duluth	0	1	0	0	0	0	0	0	0
Iowa:									
Des Moines	1	0	0	0	0	0	0	3	0
Missouri:									
Kansas City	1	0	0	0	0	0	0	0	0
St. Joseph	1	0	0	0	0	0	0	0	0
St. Louis	4	2	0	0	0	0	1	0	0
North Dakota:									
Fargo	0	0	0	0	0	0	1	1	0
South Dakota:									
Aberdeen	1	0	0	0	0	0	0	0	0
Kansas:									
Wichita	0	0	0	0	0	0	0	2	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	1	1	1	0	0	0	0	1	0
Virginia:									
Lynchburg	0	0	0	0	0	0	0	1	0
Norfolk	0	0	0	0	0	1	0	0	0
Richmond	0	0	0	0	0	0	0	3	0
Roanoke	0	0	0	0	0	0	0	7	0
North Carolina:									
Wilmington	0	0	0	0	2	0	0	0	0
Winston-Salem	0	0	0	0	1	2	0	0	0
South Carolina:									
Charleston	0	0	0	0	2	0	0	0	0
Columbia	0	0	0	0	0	1	0	0	0
Georgia:[1]									
Atlanta	0	0	0	0	0	1	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	0	1	0	0	0	0	0	0	0
Nashville	1	0	0	0	0	1	0	0	0
Alabama:									
Montgomery	0	0	0	0	1	0	0	0	0

[1] Typhus fever: 5 cases; 3 cases at Savannah, Ga., and 2 cases at Dallas, Tex.

City reports for week ended October 5, 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
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	1	1	0	0	0	0	0	0	0
Oklahoma:									
Oklahoma City	0	0	0	0	1	0	0	0	0
Texas:									
Dallas [1]	0	0	0	0	2	3	0	0	0
Fort Worth	0	0	0	0	0	1	0	0	0
Galveston	0	0	0	0	1	1	0	0	0
San Antonio	0	0	0	0	0	2	0	0	0
MOUNTAIN									
Utah:									
Salt Lake City	2	1	0	0	0	0	0	0	0
PACIFIC									
California:									
Los Angeles	0	1	0	0	0	0	1	0	0
Sacramento	1	1	0	0	0	0	0	0	0
San Francisco	2	0	0	0	0	0	0	0	0

[1] Typhus fever: 5 cases; 3 cases at Savannah, Ga., and 2 cases at Dallas, Tex.

The following table gives the rates per 100,000 population for 98 cities for the 5-week period ended October 5, 1929, compared with those for a like period ended October 6, 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 have an estimated aggregate population of more than 31,000,000. The 91 cities reporting deaths have 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, September 1 to October 5, 1929—Annual rates per 100,000 population, compared with rates for the corresponding period of 1928 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Sept. 7, 1929	Sept. 8, 1928	Sept. 14, 1929	Sept. 15, 1928	Sept. 21, 1929	Sept. 22, 1928	Sept. 28, 1929	Sept. 29, 1928	Oct. 5, 1929	Oct. 6, 1928
98 cities	[2] 64	51	66	[3] 75	75	79	83	88	[4] 97	100
New England	[2] 47	34	48	87	50	67	77	62	88	103
Middle Atlantic	45	49	41	58	54	63	60	72	62	84
East North Central	85	51	95	67	96	92	90	97	124	92
West North Central	38	70	58	98	63	92	100	76	[5] 107	127
South Atlantic	92	48	133	[3] 113	114	92	112	138	129	134
East South Central	75	42	115	154	136	182	136	161	156	154
West South Central	138	77	63	142	154	93	170	109	206	174
Mountain	70	53	26	35	70	62	26	106	[6] 27	106
Pacific	35	49	22	49	20	54	67	72	57	64

[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] Pawtucket, R. I., not included.
[3] Lynchburg, Va., not included.
[4] Waterloo, Iowa, and Helena, Mont., not included.
[5] Waterloo, Iowa, not included.
[6] Helena, Mont., not included.

Summary of weekly reports from cities, September 1 to October 5, 1929—Annual rates per 100,000 population, compared with rates for the corresponding period of 1928—Continued

MEASLES CASE RATES

	Week ended—									
	Sept. 7, 1929	Sept. 8, 1928	Sept. 14, 1929	Sept. 15, 1928	Sept. 21, 1929	Sept. 22, 1928	Sept. 28, 1929	Sept. 29, 1928	Oct. 5, 1929	Oct. 6, 1928
98 cities		20	16	[3] 18	15	18	13	19	[4] 16	28
New England	[2] 21	55	16	39	32	48	18	55	34	85
Middle Atlantic	7	18	12	15	7	15	10	10	12	18
East North Central	16	24	20	24	17	20	13	22	12	23
West North Central	2	2	6	14	6	18	10	14	[5] 6	43
South Atlantic	2	6	7	[3] 12	7	17	13	13	11	23
East South Central	14	0	7	14	7	7	0	0	0	0
West South Central	4	4	12	0	8	4	12	8	0	4
Mountain	26	35	61	44	26	0	44	9	[6] 36	44
Pacific	47	28	40	13	52	10	25	41	67	41

SCARLET FEVER CASE RATES

98 cities	[2] 52	37	54	[3] 57	68	63	95	77	[4] 102	99
New England	[2] 84	46	52	78	50	101	100	83	136	90
Middle Atlantic	25	18	16	28	25	24	42	38	48	42
East North Central	69	44	90	88	120	91	161	100	149	132
West North Central	67	39	58	68	92	104	108	115	[5] 121	182
South Atlantic	64	50	47	[3] 45	66	71	105	80	120	121
East South Central	41	70	95	105	48	56	75	210	81	133
West South Central	36	57	95	45	75	28	75	85	75	150
Mountain	17	27	70	27	113	53	139	62	[6] 133	18
Pacific	80	59	75	64	70	77	87	87	132	113

SMALLPOX CASE RATES

98 cities	[2] 4	1	3	[3] 1	5	1	4	2	[4] 6	3
New England	[2] 0	0	0	0	0	0	0	0	0	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	10	1	4	0	10	1	3	1	7	5
West North Central	2	4	8	4	6	4	8	2	[5] 0	2
South Atlantic	0	0	2	[3] 0	0	0	0	0	0	0
East South Central	0	0	0	0	0	0	0	7	48	0
West South Central	0	0	0	4	0	4	0	4	0	0
Mountain	9	9	9	9	52	0	96	9	[6] 53	9
Pacific	15	8	12	3	17	5	10	15	37	18

TYPHOID FEVER CASE RATES

98 cities	[2] 18	24	21	[3] 28	22	27	20	23	[4] 15	24
New England	[2] 2	16	16	14	14	21	7	9	11	16
Middle Atlantic	20	25	18	29	14	23	12	26	14	25
East North Central	13	13	10	14	11	16	9	14	12	13
West North Central	12	20	17	25	6	31	23	27	[5] 16	12
South Atlantic	34	36	34	[3] 39	26	33	17	27	30	33
East South Central	54	105	88	140	0	112	81	77	20	42
West South Central	16	28	51	28	87	69	28	41	8	53
Mountain	44	80	70	18	340	27	313	18	[6] 27	124
Pacific	15	13	20	38	7	18	10	13	10	28

[2] Pawtucket, R. I., not included.
[3] Lynchburg, Va., not included.
[4] Waterloo, Iowa, and Helena, Mont., not included.
[5] Waterloo, Iowa, not included.
[6] Helena, Mont., not included.

Summary of weekly reports from cities, September 1 to October 5, 1929—Annual rates per 100,000 population, compared with rates for the corresponding period of 1928—Continued

INFLUENZA DEATH RATES

	Week ended—									
	Sept. 7, 1929	Sept. 8, 1928	Sept. 14, 1929	Sept. 15, 1928	Sept. 21, 1929	Sept. 22, 1928	Sept. 28, 1929	Sept. 29, 1928	Oct. 5, 1929	Oct. 6, 1928
91 cities	[2] 3	3	3	[3] 5	2	4	5	6	[6] 6	7
New England	[2] 0	0	0	0	2	2	2	5	5	7
Middle Atlantic	2	2	2	4	0	5	5	2	7	7
East North Central	6	2	2	5	2	4	4	3	5	5
West North Central	0	3	6	15	6	3	3	3	6	3
South Atlantic	4	8	2	[3] 8	2	4	6	8	7	10
East South Central	7	23	7	23	7	15	0	8	0	23
West South Central	0	8	12	8	0	4	12	29	16	8
Mountain	0	0	9	0	9	0	17	0	[6] 0	18
Pacific	3	7	0	3	10	0	3	24	10	7

PNEUMONIA DEATH RATES

91 cities	[2] 58	58	55	[3] 65	54	68	67	68	[6] 77	87
New England	[2] 44	48	36	62	29	76	72	60	36	51
Middle Atlantic	75	56	66	69	59	74	72	75	93	106
East North Central	44	60	47	64	47	59	54	51	61	76
West North Central	57	34	45	64	39	61	81	61	108	89
South Atlantic	64	71	52	[3] 70	66	84	60	80	81	96
East South Central	74	69	89	38	67	69	118	123	30	107
West South Central	32	58	57	71	65	12	97	100	118	100
Mountain	52	44	70	44	104	71	70	35	[6] 124	62
Pacific	33	78	43	61	59	91	39	64	49	47

[2] Pawtucket, R. I., not included. [3] Lynchburg, Va., not included. [6] Helena, Mont., 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 September 28, 1929.—The Department of Pensions and National Health reports cases of certain communicable diseases in Canada for the week ended September 28, 1929, as follows:

Province	Cerebrospinal fever	Influenza	Lethargic encephalitis	Poliomyelitis	Smallpox	Typhoid fever
Prince Edward Island						
Nova Scotia						4
New Brunswick			1	1		18
Quebec				6		12
Ontario	2	1	1	72	5	13
Manitoba	1			3		4
Saskatchewan				5		3
Alberta				8		
British Columbia	4			4		
Total	7	1	2	99	5	54

Quebec Province—Communicable diseases—Week ended September 28, 1929.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the week ended September 28, 1929, as follows:

Disease	Cases	Disease	Cases
Chicken pox	10	Poliomyelitis	6
Diphtheria	57	Scarlet fever	51
German measles	1	Tuberculosis	33
Influenza	1	Typhoid fever	12
Measles	16	Whooping cough	60
Mumps	6		

Quebec Province—Vital statistics—July, 1929.—Births, deaths, and marriages for the month of July, 1929, in the Province of Quebec, Canada, with deaths from certain principal causes, are shown in the following table:

Estimated population	2,091,000
Births	6,555
Birth rate per 1,000 population	28.7
Deaths	2,523
Death rate per 1,000 population	11.0
Deaths under 1 year	611
Infant mortality rate	93.2
Deaths from—	
Cancer	155
Cerebrospinal meningitis	7
Diabetes	30
Diarrhea	128
Diphtheria	21
Heart disease	318
Deaths from—Continued.	
Influenza	22
Measles	6
Pneumonia	123
Poliomyelitis	1
Scarlet fever	6
Smallpox	0
Syphilis	3
Tuberculosis (pulmonary)	216
Tuberculosis (other forms)	66
Typhoid fever	20
Violence	174
Whooping cough	18

CHINA

Manchuria—Plague.[1]—A report dated September 14, 1929, from the North Manchurian Plague-Prevention Service states that four of the plague-infected villages—Wu Chia Tze, Si Chia Gan Tu Li Ka, Pa Yin Ta La, and Small San Chia Tze—were quiet. At Pa Yin Ta La 10 cases had been discovered between August 13 and 31. Cases reported in newly infected villages were as follows:

Village	Date	Cases
Pa Yin Ta La (north of Tungliao)	Aug. 26–28	15
Wu Mung Tung	Aug. 31–Sept. 5	9
Ni Mu Tai	Sept. 3–10	3
Si Poi Ying Tze	Sept. 10	----

In the Nungan district two villages were reported to be involved—Yan Shu Lin, where 17 cases were reported between August 24 and September 3, and Shuan Lung San. An antiplague bureau has been inaugurated in the Nungan district.

CUBA

Provinces—Communicable diseases—Four weeks ended June 8, 1929.—During the four weeks from May 12 to June 8, 1929, cases of certain communicable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	----	----	4	5	2	----	11
Chicken pox	----	10	1	4	5	3	23
Diphtheria	1	9	1	3	----	5	19
Malaria	----	13	1	5	12	30	61
Measles	22	54	12	3	----	2	93
Paratyphoid fever	1	1	1	5	2	2	12
Scarlet fever	----	5	----	1	----	----	6
Tetanus (infantile)	2	----	2	----	----	----	4
Typhoid fever	52	46	15	13	7	22	155

JAPAN

Lethargic encephalitis—September 1–21, 1929.—During the three weeks ended September 21, 1929, 327 deaths from lethargic encephalitis were registered in Japan. The disease appeared to be most prevalent in the region around the Inland Sea, including the island of Shikoku, the district of Chugoku, and the Provinces of Osaka, Hiogo, Wakayama, and Kyoto.

[1] See Public Health Reports, Oct. 11, 1929, p. 2487.

NETHERLANDS

Smallpox—September 1-28, 1929.—From September 1 to 28, 1929, 77 cases of smallpox with 11 deaths were reported in Rotterdam, Netherlands. In Delft during the same period 183 cases were reported. During the two weeks ended September 28, 1929, there were 32 cases of smallpox reported in the Netherlands outside of Rotterdam and Delft.

PORTO RICO

San Juan—Communicable diseases—Five weeks ended September 28, 1929.—During the five weeks ended September 28, 1929, cases of certain communicable diseases were reported in San Juan, Porto Rico, as follows:

Disease	Cases	Disease	Cases
Diphtheria	7	Tetanus (infantile)	4
Leprosy	1	Tuberculosis	74
Malaria	6	Typhoid fever	3
Syphilis (cutaneous)	15	Whooping cough	1

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

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, 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		Mar. 10–Apr. 6, 1929	Apr. 7–May 4, 1929	May 5–June 1, 1929	June 2–29, 1929	Week ended— July, 1929				August, 1929					September, 1929			
						6	13	20	27	3	10	17	24	31	7	14	21	28
Ceylon	C			3														
	D			3														
Colombo	C		1	3	1													
	D			3	1													
China:																		
Amoy	C				4	1	2	4		1								
Canton	C	3	3	2	10	3	1		2	1	2	2			1			
	D		3	1	5	3	1		1	1		2			1			
Manchuria—																		
Kwantung—Dairen	C										1							
Newchwang	C														P	1		
Shanghai	C					1		1			9	797	500	483	360	139		
	D							1	2	4	24	41	29	30	23	8		
Swatow	C				P													
	D				4	2	1	3	1	2	5	3	2	1	20	6		
Tientsin	C																P	
Chosen: Chemulpo	C															P		
India	C	9,046	18,521	30,616	29,449	7,315	6,946	8,271	9,549	10,105	10,269	10,662						
	D	4,997	11,069	20,311	19,910	4,783	4,431	5,166	4,963	6,129	6,230	5,939						
Bassein	D	45	118	38	2					3		3						
Bombay	C	6	3		2					1	1							1
	D	2		2	2					1								
Calcutta	C	552	788	924	354	82	69	59	65	65		64	41	43				
	D	307	461	605	176	41	29	59	28	24	28	36	18	13	15	15	16	
Karachi	C										1	3	6	1	4	6		
Madras	C			1				1										
	D							1	1									
Moulmein	D	7	6	31	5			1										
Negapatam	C				1			1										
Rangoon	C	15	8	13	8			1		1								
	D	37	10	7	8			1		1								

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

CHOLERA—Continued

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

Place		Mar. 10–Apr. 6, 1929	Apr. 7–May 4, 1929	May 5–June 1, 1929	June 2–29, 1929	Week ended— July, 1929 6	13	20	27	August, 1929 3	10	17	24	31	September, 1929 7	14	21	28
India—Continued.																		
Tuticorin	C				34	4	2											
	D				30		2											
Vizagapatam	D							1										
India (French):																		
Chandernagor	C	3	3	3	3	1	1				1							
	D	3	1	3	3	1			1									
Karikal	C	20	3								1							
	D	15	3															
Pondicherry Province	C	46		3	3													
	D	38		3	3													
India (Portuguese)	C											1						
	D											1						
Indo-China (see also table below):																		
Pnompenh	C	13	15	14	11	2	2	3				1	2		2		1	
	D	10	9	10	4	1	1	2	1			1	2		2			
Saigon and Cholon	C	12	13	71	188	0	6	1	2	2								
	D	2	8	37	139	8	4	1	1	2								
Japan:																		
Kobe	C											P	2	4	3		2	
Osaka	C											1	4	18	14	8	1	
Shimonoseki	C												P	2				
Siam	C	397	619	619	469	214	49	54	54	123	29	13	15	12				
	D	269	404	436	285	112	38	26	26	80	17	10	5	11				
Anthoang	C								4				10					
	D								4				3					
Ayudhaya	C	1	29	2	25			6	11		2							
	D	1	19		11			3	8									
Bangkok	C	38	111	131	30	2	2	1	2		2	3	4	1	3	4	2	
	D	21	74	77	13		1					2	1	1	2	1	1	
Chaxoengsao	C			1														
	D			1														
Dhannapuri	C		17															
	D		7															

Lobpuri	C		1										2	3				
	D		1										2	3				
Nagara Pathom	C		36	13														
	D		20	10														
Nagara Rajsima	C							21	36									
	D							12	17									
Smud Songram	C							2	1									
	D							2	1									
Sridharmaraj Province [1]	C									2	13							
	D									2	11							
On vessel:																		
S. S. Angby, at Saigon-Cholon	C				1													
	D				1													
S. S. Cap. St. Jacques, at Singapore, from Saigon-Cholon	C					P												
S. S. Elephanta, at Penang, from Calcutta	C	P																
S. S. Erinpura, at Madras	C			2														
S. S. Media, at Colombo, from Calcutta	C			1														
S. S. Saka Maru, at Calcutta	C			6														
S. S. Shinsei, at Shanghai	D														3			
S. S. Tilawa, at Penang, from Singapore	C	P																
S. S. Tokushima, at Hong Kong	C				2													
	D				2													
S. S. Texas Maru, at Nagasaki, from Shanghai	C											1						

Place		February, 1929	March, 1929	April, 1929	May, 1929	June, 1929			July, 1929			August, 1929			Sept. 1–10, 1929
						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):															
Annam	C		6	20	[2] 20				2	5	2		3	14	1
Cambodia	C	69	29	84	[2] 215				55	71	60		21	14	4
Cochin-China	C	223	183	88	[2] 123				146	123	46		45	15	45
Laos	C								1		12				
Tonkin	C				5	4									

[1] There were 98 cases of cholera with 16 deaths in Nagara Sridharmaraj Province, Siam, from May 16 to July 7, 1929.
[2] Reports incomplete.

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

PLAGUE

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

Place		Mar. 10–Apr. 6, 1929	Apr. 7–May 4, 1929	May 5–June 1, 1929	June 2–29, 1929	June 30–July 27, 1929	Week ended— August, 1929 3	10	17	24	31	September, 1929 7	14	21	28	Oct 5, 1929
Algeria:																
Algiers	C											1	1			
Philippeville	C					3	3									
Argentina:																
Buenos Aires	C	2	1													
	D	2														
Rosario	C	31	5													
Azores: St. Michaels Island	C	1				1										
Belgian Congo:																
Blukwa	C				3											
	D				3											
Buki	C					2										
	D					2										
Djugu	C			2	3	5			1		1	1				
	D			3	3	5			1		1	1				
Rekwa	C					2										
	D					2										
Brazil: Porto Alegre	C		1													
British East Africa (see also table below): Uganda	C	130	231	450	1,437	1,437	296	270	152	122						
	D	124	219	400	1,072	1,199	263	235	125	107						
Canary Islands: Tenerife	D					1										
Laguna	C			1												
Ceylon:																
Colombo	C	4	5	7	2	P						1				
	D	1	4	6	3							1				
Plague-infected rats			1			6				1	7					
Galle	C					3					1	3	1	3		
	D					3					1	2	1	2		
Kandy	C									1	1					
	D									1	1					
Matara	C					12										
	D					11										
China:																
Amoy	C						P									
Foochow	C					P		P		P		P				
Hong Kong	C									1		1				
	D									1		1				
Plague-infected rats										3	1	1				
Manchuria—Tungliao District	C					P	13	3								

Dutch East Indies: Java—																
Batavia and West Java	C	64	63	58	47	69	33	33		56	49					
	D	65	63	56	47	68	33	32		56	49					
Plague-infected rats		5	8													
East Java and Madura	C	3				3		2	1							
	D	3				3		2	1							
Surabaya	C				3	11	3									
	D				3	11	3									
Ecuador (see table below).																
Egypt:																
Alexandria	C			1	1	7	1		1	3	3	2	4	2	3	1
	D				1	3		1			1	1	2	1	1	
Assuan	C					4							1			
	D					4										
Beheira	C					2										
	D					2										
Beni Suef	C	2	7		6	4	1						1			
	D	2	2		2											
Dakahlieh	C			9	1	1							2			
	D			1					1				2			
Gharbieh	C					9			1							
	D					1			1							
Girga	C					3										
Kena	C					2										
	D					2										
Menufieh Province	C					3										
Miniah	C					7			1							
Port Said	C		2	3	2	3	2	1	2	1	2					
	D		1	2	1	2	1	1	3	1	3					1
Suez	C	2				1										
France: Paris	C														P	
Greece (see also table below):																
Patras	C										1		1	1		
Piræus	C										1	1	1			
Hawaii: Hamakua—Kukuihaele—Plague-infected rats				6	1										3	
India	C	16,011	6,884	1,394	677	1,812	909	1,070	1,033							
	D	12,592	5,623	1,205	414	1,059	536	599	487							
Bassein	C		1			9	4	3	2	4	2	1	1			
	D	6	2	2	4	1	5	3	2	4	1	1	2			
Bombay	C	8	8	1			1				1					
	D	6	6	1	4		1				1			1		
Plague-infected rats		57	81	44	35	23	7			3	9	8	7	4		
Madras Presidency	C	132	38	64	85	97	62	72	41							
	D	80	14	40	38	52	27	36	29							
Rangoon	C	12	11	2		24	5	4	3	3	4					
	D	9	15	3	9	18	5	2	3	2	4	2	1	2		
Plague-infected rats		15	10	5	6	9				10	7	6	2			
Indo-China (see also table below):																
Pnompenh	C	10	8	5	4	7	1	5	2		1	1	2			
	D	10	8	3	3	8	1	5	2		1	1	2			
Saigon and Cholon	C				1	6	2	1		1		1				
	D					1	2	1		1						

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

PLAGUE—Continued

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

Place		Mar. 10–Apr. 6, 1929	Apr. 7–May 4, 1929	May 5–June 1, 1929	June 2–29, 1929	June 30–July 27, 1929	Week ended— August, 1929 3	10	17	24	31	September, 1929 7	14	21	28	Oct. 5, 1929
Iraq:																
Baghdad	C	11	8	14	12	1		1	1							
	D	3	7	5	2											
Plague-infected rats		14	2	1												
Diyalah Liwa	C		7	12	1	1										
	D		7	7												
Naudham	C				1	1										
Japan: Osaka—Plague-infected rats				2												
Madagascar (see also table below):																
Tamatave	C			P	2	5								2	1	
	D	1	1		2											
Morocco	C	106	31	42	16	39				4	1					
	D	73	16	4	5	17										
Nigeria: Lagos	C	4	8	5	2	1		1	2	6		4	6	5		
	D	4	8	4	1	1		1	2	5		4	6	5		
Plague-infected rats		18	6	8	4	13	3	8	2	3		8				
Peru (see table below).																
Senegal (see table below).																
Siam	C	9	10	9	1	4		3								
	D	8	8	5	1	3		3								
Bangkok	C			2		1		3				1				
	D			1		1		3				1				
Nagara Pathom	C	4	2	3												
	D	4	2	2												
Straits Settlements: Singapore	C		1										1			
	D		1	1									1			
Tunisia:																
Tunis	C					P					4	4	2			
	D										1					
Plague-infected rats													4			
Turkey:																
Adalia	C							1								
Constantinople	C				P	2										
Union of Socialist Soviet Republics:																
Caucasia	C				1	7		2								
	D				1	3		1								
Ural—Kirghiz	C				4											
	D				4											

Union of South Africa:																	
Cape Province	C	1	2			3											
	D	1	1			2											
Orange Free State	C	3	4								1						
	D	2	1														
Transvaal	C	8															
	D	8															
Uruguay: Montevideo	C	4															
On vessel:																	
S. S. Chaban, at Port Said, from Jaffa	C									1							
	D									1							
S. S. Chenonceaux, at Singapore, from Colombo	C	1															
	D	1															
S. S. Tokio, at Shanghai, from Singapore	C					1											
	D					1											
S. S. Ganzan Maru, at Osaka, from Haipong	C			1													
S. S. Seigo Maru, at Osaka, from Bombay—Plague-infected rats				1													
S. S. Soudades, at Hamburg, from Rosario, Argentina—Plague-infected rats			2														
S. S. Sumatra, at Osaka, from Bombay	C		1	1													

Place		March, 1929	April, 1929	May, 1929	June, 1929	July, 1929	August, 1929
British East Africa (see also table above):							
Kenya	C	10	4	22	69		
Uganda	C	121	282		1,215	1,203	
	D	113	264		932	973	
Ecuador: Guayaquil	C	26	19	2		1	6
	D	4	5	1			1
Plague-infected rats		14	13	3	1		4
Greece (see also table above)	C		1			3	2
	D					1	1
Indo-China (see also table above)	C	3	13			42	
Madagascar (see also table above)	C	196	92			14	
	D	194	88			14	
Ambositra Province	C	90	8				
	D	90	8				
Antisirabe Province	C	13				2	
	D	13				2	
Itasy Province	C	8	2				
	D	7	2				
Moramanga Province	C	5	3			1	
	D	5	3			1	
Tananarive Province	C	120	78		11	16	
	D	119	74		11	16	

Place		March, 1929	April, 1929	May, 1929	June, 1929	July, 1929	August, 1929
Peru	C	35		10	16	11	
	D	13		5	8	3	
Senegal:							
Baol [1]	C	6	1	21	43	22	32
	D	3	1	6	18	9	13
Dakar [1]	C		6	17	67	62	76
	D		4	11	45	45	65
Louga [1]	C					59	121
	D					39	70
Rufisque [1]	C					22	
	D					7	
Thies [1]	C	4	20	6	10	61	53
	D	3	20	3	6	34	33
Tivaouane [1]	C			22	93	161	188
	D			10	50	96	119

[1] Incomplete reports.

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

SMALLPOX

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

Place		Mar. 10–Apr. 6, 1929	Apr. 7–May 4, 1929	May 5–June 1, 1929	June 2–29, 1929	June 30–July 27, 1929	Week ended— August, 1929					September, 1929				October, 1929	
							3	10	17	24	31	7	14	21	28	5	12
Algeria:																	
Algiers	C	3	5	5	6	7		1									
Cherchell	C	42	1		1												
Oran	C	1	2	5	1	1							4				
Angola (see table below).																	
Arabia: Aden	C	30	69	40	110	103	11	17	6	4	1	2	1				
	D	8	20	20	20	56	20	10	4	3	1						
Australia: Fremantle Quarantine Station	C					1											
Bermuda: Hamilton	C				1												
Brazil:																	
Porto Alegre	C			1							3		1				
Rio de Janeiro	C			3													
British East Africa (see also table below):																	
Tanganyika	C		3	4	7	10		2			2						
British South Africa:																	
Northern Rhodesia	C					73											
	D					4											
Southern Rhodesia	C	69	13	12		5											
Canada:																	
Alberta	C	7	8		12		1	2	1					4			
Calgary	C		2				1	1									
Edmonton	C	12	5		4				1								
British Columbia—Vancouver	C	64	46	23	13	14	5		2	1		2	3				
Manitoba	C	3	12	6	6	1											
Winnipeg and vicinity	C				2												
New Brunswick	C	3															
Nova Scotia	C		1				2										1
Ontario	C	57	113	40	84	57		2	5		5	4	3	7	5		
Niagara Falls	C	1		3													
North Bay	C		3	8	2	7								3	4	2	
Ottawa	C				1	1		1									
Toronto	C	2	1		5	7					1	1		1	1		
Windsor	C		3	3	2	2											
Prince Edward Island	C						1	1									

Quebec	C	14	34	12	10	2	1	1	1					1		2	
Montreal	C	4	4	1	1												
Quebec	C	3	1	1	2		1										
Riviere du Loup	C		1			2											
Saskatchewan	C	13	13	14					1		1	3					
Moose Jaw	C	1															
Saskatoon	C	1									1				5		
China:																	
Amoy	C	3	4	2													
Canton	C	135	85	46	16	12	2										
	D	15	12	4	1	2											
Chefoo	C		P	P													
Foochow	C	P	P			P		P		P		P					
Hong Kong	C	92	53	29	10	1	1		3	1		1		1	1		
	D	137	97	25	6	5		1	2	1		1		1	1		
Manchuria—																	
Changshun	C		1														
Harbin	C	1	4					1									
Kwantung—																	
Dairen	C	1	11	21	11	14						1					
	D		4	8	3	9		1									
Port Arthur	C			3													
Mukden	C	1															
Nanking	C					P	P	P	P	P	P						
Shanghai—																	
Foreigners only	C	4	1	6	7	3											
Including natives	D	25	16	16	5	3											
Swatow	D	33	93	62	24	15	2										
Tientsin	C	8	6	12								2					
Tsingtao	C	P	P	P	P												
Yunnanfu	C	P	P														
Chosen (see table below).																	
Colombia: Barranquilla	D					2						1			3		
Curacao (alastrim)	C		1														
Dutch East Indies:																	
Balikpapan	C	5	3	4	1												
Belawan Deli	C	7	4		1	2				1	1						
	D	2				1											
Borneo—Samarinda	C	2	1		3	13	7										
	D	3			1												
Celebes—Makassar	C	6	39	43	20	21	2	1		1	1	5	4	2	3		
	D	2	25	33	15	11	1	1		1	1	1	2	1			
Java—																	
Batavia and West Java	C			1	6	8	1	2	5	2	3	1	1	3			
	D				1	2	1	2	2			1	3				
East Java and Madura	C						1	2									
	D						1										
Sumatra—																	
Baros	C	16															
	D	2															
Medan	C	7	2	1	1	3	1	1		1	1	2					
	D	3		1		1											

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

SMALLPOX—Continued

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

Place		Mar. 10–Apr. 6, 1929	Apr. 7–May 4, 1929	May 5–June 1, 1929	June 2–29, 1929	June 30–July 27, 1929	Week ended— August, 1929 3	10	17	24	31	September, 1929 7	14	21	28	October, 1929 5	12
Ecuador (see table below).																	
Egypt:																	
Port Said	C	-------	1	-------	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Suez	C	-------	5	-------	-------	-------	-------	-------	-------	-------	3	2	-------	-------	-------	-------	-------
France (see table below).																	
Great Britain:																	
England and Wales	C	1,156	1,423	1,179	789	541	129	114	120	139	131	150	96	119	-------	-------	-------
Ashton under Lyne	C	-------	-------	-------	-------	7	-------	2	1	-------	-------	-------	-------	-------	-------	-------	-------
Birmingham	C	-------	1	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Bradford	C	3	1	4	4	3	-------	-------	-------	-------	1	3	1	3	-------	-------	-------
Bristol	C	-------	-------	-------	-------	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Cardiff	C	1	1	4	-------	-------	-------	-------	-------	1	-------	-------	-------	-------	1	-------	-------
Castleford	C	56	31	12	3	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Leeds	C	8	3	-------	1	1	-------	-------	-------	1	-------	2	-------	-------	-------	-------	-------
Liverpool	C	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
London	C	58	201	193	167	107	31	19	-------	28	37	41	27	39	-------	-------	-------
London and Great Towns	C	598	888	656	496	363	73	60	74	90	79	81	59	85	-------	-------	-------
	D	3	6	3	1	4	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Newcastle-on-Tyne	C	10	3	37	20	15	1	2	-------	1	2	-------	-------	-------	1	-------	-------
Nottingham	C	2	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Stoke-on-Trent	C	72	133	86	62	32	1	10	1	6	2	2	7	7	-------	-------	-------
West Ham	C	-------	-------	-------	-------	26	22	17	20	-------	-------	-------	-------	-------	-------	-------	-------
Scotland—																	
Aberdeen	C	-------	2	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Glasgow	C	1	19	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Greece (see table below).																	
Hedjaz	C	84	77	40	83	53	4	2	-------	5	17	2	2	1	-------	-------	-------
	D	52	52	24	53	35	3	2	-------	14	3	1	2	-------	-------	-------	-------
Honduras: Puerto Castilla	C	-------	-------	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
India	C	19,120	22,556	17,011	11,549	7,838	1,717	1,435	1,194	-------	-------	-------	-------	-------	-------	-------	-------
	D	3,983	5,060	4,185	3,006	2,062	472	397	275	-------	-------	-------	-------	-------	-------	-------	-------
Bombay	C	441	315	208	147	92	18	18	16	11	18	5	6	8	7	-------	-------
	D	206	175	131	99	55	7	9	12	3	10	3	5	6	2	-------	-------
Calcutta	C	127	101	39	27	16	13	2	9	7	2	7	9	3	1	-------	-------
	D	77	74	36	24	11	11	2	3	6	-------	7	6	3	1	-------	-------

Cochin	C									4	2	1	4	6	2		
	D										1						
Karachi	C	206	144	84	35	25	6	1	2	6	5	6	8	8	3		
	D	70	59	59	25	13	1	1	1	4	1	6	3	6			
Madras	C	392	327	174	88	122	28	16	33	12	19	14	16	33	22		
	D	83	84	61	20	32	8	6	2	6	3	4	7	7	2		
Moulmein	C	18	7	8	6	10	2	8	1		2	1	2		2		
	D	4	6	6	5	5	1	3	1		1	1					
Negapatam	C	9	7	2	6	4				1	1	1	1		1		
	D	1										1					
Rangoon	C	13	7	1		3	1										
	D	6	3	1		1											
Tuticorin	C		1		1												
Vizagapatam	C	26	28	2	4	3						1					
	D	5	8		2	2		1				1					
India (French):																	
Karikal	C	2	2	3	5	1	2	10				8					
	D	2	2	3	5	1	2					7					
Pondicherry Province	C	70	60	32	18	21	6	3	2	1	2	2	2	2	3		
	D	60	51	30	15	16	1	3	2	1	2	2	2	2	3		
India (Portuguese)	C			3	9	4											
Indo-China (see also table below):																	
Pnompenh	C	68	40	22	8	9		2	1		1						
	D	33	24	12	2	3	1	1	1		1						
Saigon and Cholon	C	2	2	1		1											
	D			1	1												
Iraq:																	
Baghdad	C	6	6	3	1	1											
	D	1															
Basra	C	9	8	8	9	1											
	D	2	6	8	1												
Diyalah Liwa	C			48		8				13				4			
	D			13		2				12							
Mossoul	C				20	12	21			60	35	7	18	8			
	D						1			12	12		5				
Ivory Coast (see table below).																	
Jamaica (outside Kingston) (alastrim)	C		1	1		7											
Japan:																	
Niigata	C			12	2												
Osaka	C			1													
Shimane Province	C	16	3														
Tokyo	C			2	1												
Macao	D	32	20	5	2												
Mexico:																	
Acapulco	C		1	1	2	3	1	2									
	D		1	1	2	3	1	2									
Aguascalientes	D	5	9	6	17	11	2	3	1	1	3	1	2			3	
Chiapas Province	C	P															
Coahuila	D				1												
Jalisco (State): Guadalajara	D	13	12	15	11	6	1	2		2	5	1	2		2		
Juarez	D	3								3	P				8		

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

SMALLPOX—Continued

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

Place		Mar. 10–Apr. 6, 1929	Apr. 7–May 4, 1929	May 5–June 1, 1929	June 2–29, 1929	June 30–July 27, 1929	Week ended— August, 1929 3	10	17	24	31	September, 1929 7	14	21	28	October, 1929 5	12
Mexico—Continued.																	
Mexico City and surrounding territory	C	1		1	9	13	5	5	7	4	1	2	2	3			
	D				10	3		3	3			1					
Tampico	C	2															
Vera Cruz	D	2															
Morocco (see table below).																	
Netherlands: Rotterdam	C					40	30	53	58		33	31	21	25	5		
	D						1					4	2	1	4		
Nicaragua: Managua	C		P														
Nigeria: Lagos	C	1	1	2		1											
Norway: Stavanger	C		2														
Palestine	C			1													
Panama [1]	C					14		1		4	4	14		77		62	31
Panama Canal Zone	C	P		1	1												
Persia (see table below).																	
Poland	C		6	2	66				1	1							
	D				2												
Portugal:																	
Lisbon	C	3	4	1	6	4		1						1			
Oporto	C	1	2		2	2											
Senegal (see table below).																	
Siam	C		55	32	27	71	1	19	4	8							
	D		8	9	7	14	2	1	2	2							
Somaliland, British: Boales	C				11	4							3	1	1		
	D				4									2	1		
Somaliland, French: Jibuti	C			3	16	123	8	10	6	7	5	3		2			
	D			1	8	21	11	1	6	3	5	3	1	2			
Spain: Valencia	C	5			1												
Straits Settlements: Singapore	C	1															
Sudan (Anglo-Egyptian)	C	245	377	1,570	1,172	1,121	55	11	12	9	10	580		8	172	29	
	D	29	26	132	195	164	51	1	5	16	16	79				5	
Sudan (French) (see table below).																	
Syria (see table below).																	
Tunisia: Tunis	C		2		2	1											

Turkey (see table below).																		
Union of Socialist Soviet Republics: Vladivostok	C			2														
Union of South Africa:																		
Cape Province	C		P	P	P													
Transvaal	C	P	P	P	P							P						
Upper Volta	C	4	15	2	10													
On vessel:																		
S. S. Aorangi, at Sydney	C				1													
S. S. Assyria, at Suez, from Bombay	C			1														
S. S. City of Hereford, at Brisbane, from Calcutta	C					1												
S. S. City of Venice, at Suez, from Calcutta	C			1														
S. S. Fern, at Port Said, from Abadan	C			P														
S. S. British Birch, at Suez, from Abadan	C				1													
S. S. Keneh, at Suakim, from Jeddah	C				4													
S. S. Le Panto, at Suez, Egypt	C			4														
S. S. Lopez-Lopez, at Suez	C		1															
S. S. Malwa, at Suez	C		1															
S. S. Mancar, at Suez, from Calcutta	C		1															
Tantalus (motor ship), at Amsterdam	C	3																
S. S. Tuscania, at Glasgow, from Bombay	C		P															

Place		February, 1929	March, 1929	April, 1929	May, 1929	June, 1929	July, 1929			August, 1929			September, 1929	
							1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20
Indo-China (see also table above)	C	364	561	755	410		87	72			123	140	64	
Ivory Coast	C		4						22		2			
Senegal	C	80	70	57	1									
	D	8	11	15										
Sudan (French)	C		26	83	2	57	2	13						
	D		3			15								
Syria: Beirut	C	48	12	18	12	36	26	1		16	6	7	4	5

Place		March, 1929	April, 1929	May, 1929	June, 1929	July, 1929	August, 1929
British East Africa (see also table above):							
Kenya	C	23	91	38	45		
Chosen	C	121	127	97			
	D	12	41	29			
Ecuador: Guayaquil	C	2	2	1			

Place		March, 1929	April, 1929	May, 1929	June, 1929	July, 1929	August, 1929
France	C	5	5	11	15		
Greece	C	2	4	5	2		
Morocco	C	8	12	39	2	9	10
Persia	D	8				51	
Turkey	C		1		11		1

[1] 354 cases of smallpox were reported from June 16 to Oct. 11, 1929, in Panama City, Panama.

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

TYPHUS FEVER

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

Place		Mar. 10–Apr. 6, 1929	Apr. 7–May 4, 1929	May 5–June 1, 1929	June 2–29, 1929	June 30–July 27, 1929	Week ended— August, 1929 3	10	17	24	31	September, 1929 7	14	21	28	Oct. 5, 1929
Algeria:																
Algiers	C	6	11	1	1	9		3	1			2	1	1		
Constantine Department	C	3			11			2								
Oran	C		8	14	5	9		2					3			
Bolivia: Pacajes Province—Calacoto Canton	C							19								
	D							5								
British South Africa: Northern Rhodesia	C			3												
	D			3												
Bulgaria	C	40	28	21	4	12					7					
	D	5	2	1	1	2										
Sofia	C					1										
Chile:																
Concepcion	C	2		1												
Valparaiso	C					1	1									
China:																
Manchuria	C	1														
Tientsin	C								1							
Chosen (see table below).																
Czechoslovakia (see table below).																
Egypt:																
Alexandria	C	1	1											1		1
	D	1		1												
Beheira Province	C	67	50	159	13	8	25		6				6		9	
	D	9	9	24	6	4							2		2	
Cairo	C			2		2				4	1	1		1		
Dakahlieh Province	C	34														
Menoufieh Province	C		35													
Port Said	C			2	2	4	1	1		1						
Suez	C								1	1						
Greece (see table below).																
Hungary	C			1												
Indo-China (see table below).																
Ireland (Irish Free State):																
Cavan County—Carrickmacross	C			1												

Donegal County—																
Inishower	C		1													
Stranorlar	C				1											
Kerry County—																
Dingle	C	2	2													
Killarney	C		2													
Tyrone County—Strabane.[1]																
Latvia (see table below).																
Lithuania (see table below).																
Mexico:																
Aguascalientes	D	5				1				1						
Mexico City, including municipalities in Federal District	C	4	4	8	14	11		7	2	2	3	3	3	5		
	D		1	2	1					1	2	3	1			
Morocco	C	19	28	5	12	27	3		3							
	D		4			11										
Norway: Oslo	C		12	2												
Palestine	C	2		2	2	4				1	1	3	1		1	
Persia	C				5	53		23								
	D				4	10		8								
Poland	C	295	314	264	177	90	16	12	12	8	2	8	7			
	D	20	25	19	7	4	3	1	3		1	2	1			
Portugal:																
Lisbon	C				1											
Oporto	C				1				1						1	
Rumania	C	220	135	179	91	33		5		4	2	8				
	D	30	16	31	13	2		1			1	2				
Tunisia	C	20	19	22	23	3		4								
Turkey (see table below).																
Union of South Africa:																
Cape Province	C	P	P	P	P	P	1	P	P	P	P	P				
Natal	C	P	P	P	P					P						
Orange Free State	C		P	P	P	P		P	P	P	P					
Transvaal	C	P	P	P	P	P		P	P	P	P					
Yugoslavia (see table below)																

Place		March, 1929	April, 1929	May, 1929	June, 1929	July, 1929	August, 1929
Canada: Ontario	C				1		
Chosen	C	177	153	272			
	D	22	9	15			
Seoul	C	3	2	1	2		
Czechoslovakia	C	41	25	18	2	2	
	D	1		1			
Greece: Athens	C	4	2		3		6
Indo-China: Tonkin	C		2				

Place		March, 1929	April, 1929	May, 1929	June, 1929	July, 1929	August, 1929
Latvia	C	1	10	7	5		
Lithuania	C	62	101	63	27	10	7
	D	1	7	5	4	1	1
Turkey	C	11	3	7	10		3
	D			1	3		
Yugoslavia	C	7		19		3	7
	D			1		1	2

[1] During the period from Apr. 14 to May 21, 1929, 18 cases of typhus fever with 4 deaths were reported in Strabane, Tyrone County, Ireland.

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

YELLOW FEVER

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

Place		Mar. 10-Apr. 6, 1929	Apr. 7-May 4, 1929	May 5-June 1, 1929	June 2-29, 1929	June 30-July 27, 1929	Week ended— August, 1929 3	10	17	24	31	September, 1929 7	14	21	28	October, 1929 5	12
Belgian Congo: Tumba	C		1														
Brazil:																	
Bahia	C	1				1											
	D	1				1											
Nictheroy	C											1					
Para	C	2	1	2		1											
	D		1		1	1											
Pernambuco	C	4															
Porto Alegre	D			[1] 1													
Rio de Janeiro	C	252	180	70	7	1	0	0	0	0	0	1	1	0	0	0	0
	D	132	94	38	5	1											
Colombia:																	
Simacota	C					4											
Socorro [2]	C					12											
Liberia: Monrovia	C	10	2		4	4											
	D	4			3	1											
On vessel:																	
S. S. Skogland, at Porto Alegre, from Rio de Janeiro	C			1													

[1] Imported.

[2] From June 19 to July 8, 1929, 41 cases of yellow fever with 23 deaths were reported in Socorro, Colombia.