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## MALTA FEVER.

### Cattle Suggested as a Possible Source of Infection, Following a Serological Study of Human Serums.

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Ever since it has been known that the causal organism of infectious abortion in cattle is of common occurrence in cow's milk, the question has been raised from time to time as to what effect this germ may have on human health. The question became more emphatic when it was established that Bang's "*Bacillus abortus*" and the "*Micrococcus melitensis*" of Bruce are so closely related that strains from bovine and caprine sources are now considered to belong to the same bacterial species.

A series of tests carried out with *Brucella melitensis* antigen and serums from patients suffering from various kinds of diseases furnished data bearing on the infectiousness of the *abortus* variety of *Br. melitensis* for man, although the study was undertaken primarily with a somewhat different problem in view.

In testing human serums from suspected Malta fever cases, the question came up in the Hygienic Laboratory as to how high a titer of agglutinins specific to *Br. melitensis* was necessary to lead to the conclusion that there was actually an infection with that organism. To aid in forming a definite opinion it was advisable to accumulate some data on the agglutinin response of *Br. melitensis* in serums from cases in which Malta fever was not suspected. A number of positive reactions were obtained, which led to the consideration of the infectiousness of the bovine type of the organism for man.

A review of the literature dealing with the prevalence of *Br. melitensis* in cow's milk and the infectiousness of the bovine strains for man is a logical preface to a study of the agglutinin reactions of human serums with the *melitensis* antigen. There are to be found in the literature a few reports of cases of Malta fever which could not be traced to infection from goats, and for which no other source of infection could be established. As it now appears possible that the source of infection in those cases may have been cow's milk, the literature concerning them is included in the review.

In an attempt to interpret the significance of the positive reactions obtained, a comparison should be made with the agglutinin titers which are considered indicative of *Br. melitensis* infections in regions where Malta fever is endemic. A brief review of the literature relating to this subject is therefore included.

### Review of the Literature.

#### PREVALENCE OF BR. MELITENSIS IN COW'S MILK.

In 1911 Schroeder and Cotton reported that they had found the infectious abortion organism in 8 of 77 samples of market milk tested (over 10 per cent), and in the milk distributed by 6 of 31 dairies (over 19 per cent). Schroeder afterwards reported a higher percentage of milk samples infected with "*Bacillus abortus*." He injected into guinea pigs 516 samples of milk from 90 dairies, and 103 of the animals developed the abortion disease. The results showed that the milk from 29 of the dairies was infected from time to time with the abortion organism.

The findings of Schroeder and Cotton have been confirmed by other investigators in other sections of the United States. Fabyan, working in Massachusetts, examined the milk from 12 cows of a thoroughbred Guernsey herd. He found the abortion organism in two of the samples. Huddleson has noted its prevalence in cow's milk in Michigan, and Fleischner and Meyer have noted its prevalence in California. There is no doubt, therefore, that a large percentage of our population at some time or other have ingested living *Br. melitensis* of the bovine type.

That this organism is also present in cow's milk in Europe is evidenced by the findings of Zwick and Krage, Kennedy, and Winkler. Zwick and Krage, working in Germany, cultivated the contagious abortion organism on agar directly from the milk of three cows. Their report does not indicate how large a percentage of samples of milk contained this organism. Winkler also investigated the milk of cows in Germany. By inoculation of guinea pigs he demonstrated the specific organism in the milk from 13, or 41 per cent, of 32 cows which had recently aborted. He was able to obtain cultures directly from 3 of the samples of milk. He also demonstrated "*B. abortus*" in 7, or 32 per cent, of 22 samples of market milk.

In 1914 Kennedy, working in England, was testing goat's milk for agglutinins specific to "*Micrococcus melitensis*," and found, to his surprise, that the control cow's milk gave a positive result. Following up this observation, he noted that 5 out of 13 samples of mixed cow's milk from 13 different dairies in London contained these agglutinins. The milk of 22 individual cows was then tested, and a positive reaction was obtained from 3 samples. Kennedy did not suspect

that the cows were infected with the organism of contagious abortion, for the relationship between this and the Malta fever organism was unknown at that time. It appears, however, that the cows were probably infected with the *abortus* variety of *Br. melitensis.*

INFECTIOUSNESS OF BOVINE STRAINS OF BR. MELITENSIS FOR MAN.

Mohler and Traum obtained serums promiscuously from 42 human beings. They tested the serums with "*B. abortus*" antigen and obtained no positive results by either the complement fixation or the agglutination tests. They also inoculated 56 tonsils and adenoids into guinea pigs and obtained the abortion organism from the organs of one of the inoculated animals.

Larson and Sedgwick reported that in systematically testing by complement fixation the serum of women who had aborted they found a larger number giving a positive reaction when the contagious abortion organism was used as an antigen than when the usual antigen of the Wassermann test was used. These investigators also tested the blood of 425 children for antibodies against "*B. abortus.*" They found 72 (17 per cent) which gave positive results with the agglutinin and complement fixation tests. It was shown that true antibodies were being dealt with, for a positive serum could be rendered negative by absorption with the abortion organism. Differing proportions of positive reactions were found in different groups of children. In one group 48 per cent of the serums gave positive reactions. A group of children supplied with milk from a herd which had never been affected with contagious abortion did not give a positive reaction. The authors considered it probable that the positive reactions indicated an active immunity, the result of repeatedly receiving the organism in the milk, though the individuals might not have suffered any notable illness. Sedgwick and Larson tested the serum of four children with clinically demonstrable enlargement of the spleen. Two gave a positive and two gave a negative complement fixation reaction. These authors also reported instances of women aborting when there was an epidemic of abortion among the cattle on their farms. No definite cause of the abortion in the women could be found.

Ramsey examined the serum from 116 children, and 7 samples were found which gave a positive complement fixation reaction with *abortus* antigen.

Nicoll and Pratt carried out the agglutination tests with the *abortus* antigen and the serum of infants and children who were inmates of a foundling asylum. With few exceptions they found the serums negative in 1:10 and 1:50 dilutions. Two samples of serum from one child, undoubtedly rachitic, gave good reactions as high as 1:100. The serum of one child having enlarged tonsils gave complete agglutination in a dilution of 1:200. The serums from five other children

with enlarged tonsils and adenoids gave a moderate or marked reaction in a dilution of 1:10. Guinea pigs inoculated with these tonsils failed to develop *abortus* infections. The serums of two children with no noteworthy clinical abnormalities gave slight reactions in the 1:10 dilution. These authors also investigated the case of premature birth at seven months in a woman who gave a negative Wassermann reaction; they found that the serum of the mother gave an agglutinin reaction in dilutions up to 1:300. The serum of the child was also positive. The vaginal discharge and milk of the mother and the feces of the child were injected into guinea pigs with negative results. Two other cases of miscarriage gave negative agglutinin reactions. The authors state that the presence of serum reactions are suggestive but not conclusive, and that no conclusive evidence has been advanced that the abortion organism produces lesions in man.

Cooledge examined for *abortus* antibodies the serums of six persons who were drinking raw milk or cream, and found agglutinin and complement fixing bodies in three of them. Of four persons drinking pasteurized milk, one gave a reaction to the complement fixation test only. Four persons who had been drinking no milk gave negative reactions. Of seven persons who drank daily for experimental purposes a pint and a half of milk known to be infected with *abortus*, there was an increased agglutinin content in the serums of five, a titer of 1:40 being the highest reported. The individuals were apparently in perfect health throughout the experiment. The author therefore concludes that the antibodies indicate a passive immunity due to the absorption of antibodies from the milk. That conclusion does not appear reasonable; for the milk consumed had an agglutinin titer of 1:40, and in one case the serum of the subject showed an agglutinin titer of 1:40.

By means of the complement fixation reaction, Williams and Kolmer examined the serums of 50 women who had recently had interrupted pregnancies. They found no evidence of *abortus* infections. The serums of 12 aborting women gave negative agglutinin reactions.

Fleischner and Meyer tested 75 infants for cutaneous hypersensitiveness to *abortus* antigen and found no specific reactions.

### CASES OF MALTA FEVER WHICH COULD NOT BE TRACED TO INFECTION FROM GOATS.

In 1905 Craig reported a case of Malta fever which was the first on record originating in the United States. The patient was a hospital nurse. There were no cases of Malta fever in the hospital at the time of her attack; but she had previously been attending sick soldiers in a hospital in Washington, D. C., and Craig thought it

possible that she had acquired Malta fever in that way. No other possible source of her infection was suggested. In the paper in which Craig reported the above-mentioned case, together with other cases in which the disease was contracted outside of the United States, he makes the following statement:

"I am convinced that a careful study, by use of the Widal test and the agglutination reaction with *Micrococcus melitensis*, of many of the cases of obscure continued fevers which are prevalent in this country will result in the demonstration that Malta fever is by no means a rare disease in the warmer portions of the United States, and that many of the so-called anomalous cases of typhoid fever are, in reality, instances of infection with the organism of Malta fever."

Weil and Ménard reported a sporadic case of Malta fever. The patient, a Parisian, had spent a few weeks in a country district where Malta fever was unknown. He had drunk about a liter of cow's milk a day and often ate cheese made from cow's milk. The clinical symptoms led to a diagnosis of Malta fever, and the patient's serum reacted with *melitensis* in a dilution of 1:1,700. The infecting organism was not obtained. The authors state that they do not know whence the contagion could have come. They are led to think that the "melitococcus" must be more common than it has been thought to be.

In his report of the finding of agglutinins for the Malta fever organism in cow's milk, Kennedy states:

"I think the possibility of a *melitensis* infection of cows in this country should not be lightly thrust aside. I have heard of two cases of undulant fever in people who have never been out of England, and it is possible there are others undiagnosed."

Khaled states that he has seen cases of undulant fever in Egypt in persons who never had a chance to ingest goat's milk, and yet they suffered from typical Malta fever as confirmed by laboratory diagnosis.

Bevan reports that there have recently occurred in Rhodesia a number of cases in which the patients showed clinical manifestations of Malta fever without, as far as could be ascertained, having imbibed goat's milk; moreover, they resided on farms where infectious abortion of cattle was known to exist. "Circumstantial evidence, therefore, points to infection through infected cattle, but direct proof is not yet available."

Klimmer and Haupt report that observations have been made in different places that perfectly healthy wives of farmers had miscarried without any evident cause. Later inquiries revealed that the cattle were infected with contagious abortion and that the women had been drinking the raw cow's milk.

According to Rebagliati, Malta fever exists in certain localities in Peru where infected goats can not be concerned in the etiology. He

regards flies as possible carriers, but does not consider the possibility that cow's milk may be responsible for the disease. No statements are made as to whether the Peruvian patients had been drinking cow's milk.

The preceding references furnish presumptive evidence that the *abortus* variety of *Br. melitensis* may infect man. In not a single case, however, is the evidence conclusive. There has recently been reported a case of Malta fever in which there is no doubt that the infection was due to the *abortus* variety. The case occurred in Baltimore, and was reported by Keefer. The clinical picture and the course of the disease were characteristic of Malta fever as it has been commonly observed in regions where it is endemic. The source and mode of the infection in this case could not be determined. There was no history of the patient having ingested goat's milk or products made from goat's milk, but he was in the habit of drinking large quantities of raw cow's milk. A sample of the patient's serum and a culture of *Br. melitensis* isolated from his blood were submitted to the Hygienic Laboratory through the courtesy of Dr. H. L. Amoss, and a study of these made by the writer showed that the infecting organism was the *abortus* variety of *Br. melitensis*. The data from which this conclusion was drawn and a more detailed discussion will be given further on.

## TITERS CONSIDERED INDICATIVE OF BR. MELITENSIS INFECTIONS IN MAN.

Birt and Lamb studied the agglutinin reaction in the serums from 50 healthy persons and 101 persons afflicted with various diseases other than Malta fever, chiefly typhoid fever and malaria. Nearly all specimens gave a well-marked, sometimes a complete, sedimentation in dilutions of 1 to 2; many gave a faint reaction in the 1 to 10 dilution; but in no instance did a complete reaction occur in the 1 to 10 dilution, and there never was a trace of reaction in the 1 to 20 dilution. Eight out of 14 samples of serum from individuals who had suffered from Malta fever from two to eight years previously gave no more marked reaction than normal serums; the remaining 6 gave complete or well-marked reactions in dilutions of 1 to 10 or over. In one case the characteristic reaction persisted in the 1 to 20 dilution for seven and one-half years after recovery. The average titer for the serums from 44 febrile cases of Malta fever was between 1:600 and 1:700. In one case the titer was 1:6,000.

Kennedy reported a case of chronic synovitis, or bursitis, with a negative serum reaction as determined in the 1 to 40 dilution; yet a culture of "*Micrococcus melitensis*" was obtained from the serous fluid withdrawn from the subdeltoid bursa. Kennedy states that in cases with slight but long continued fever and severe localized

symptoms the blood reaction is usually very low, and that one may be missed if a minimum dilution of over 1 to 30 is used.

Nicolle, of Tunis, tested the serums from 35 patients suffering with various nonmelitensis diseases, principally typhoid fever, malaria, and incipient tuberculosis. A very slight agglutinating power was noted in only six cases. In four of these the titer did not surpass 1:1. In one case of typhoid fever it attained 1:5 on the first examination and 1:10 a few days later. Nicolle concludes thus: "Our observations, like those of most others, show that the serum of healthy persons or persons afflicted with various diseases have no agglutinating power, or only a feeble agglutinating power, for *M. melitensis*. When the reaction is good in the 1:10 dilution, we think there is reason to conclude that it is due to Malta fever infection."

Nicolle and Hayat reported the titers which they determined in tests of 14 samples of serums from 13 Tunisian patients whose ailments were diagnosed as Malta fever. The titers were as follows:

1 case, 1:5.
2 cases, 1:10.
3 cases, 1:20.
1 case, 1:50.
5 cases, 1:100.
1 case, 1:500.
1 case, 1:1,000.

Bassett-Smith, who has had a wide experience with Malta fever, stated that in chronic cachetic cases the reaction is often incomplete, slow, and obtainable in only low dilutions. He reported three cases whose titers were 1:10; yet in one of these cases the organism had been isolated from the blood during the same month that the serum was tested. Bassett-Smith is of the opinion that a positive reaction in the 1:30 dilution may be considered conclusive evidence of Malta fever, past or present, but that it would not be correct to conclude that the patient is not suffering from Malta fever when an examination of the blood gives a negative reaction in this dilution.

In our own experience with serums from 9 patients who had contracted Malta fever from drinking goat's milk, the titers were as follows:

1 case, 1:20.
1 case, 1:40.
4 cases, 1:80.
1 case, 1:160.
1 case, 1:320.
1 case, 1:640.

Of two cases resulting from laboratory infections, the serum from one had a titer of 1:5,120 during the height of a febrile wave; the serum from the other laboratory case showed a titer varying from less than

1:10 as the lowest to 1:60 as the highest during a period of several months of illness. *Br. melitensis* was cultivated from the sample of blood which gave an incomplete reaction in the 1:10 dilution of the serum. The patient's temperature was 39° C. at the time the blood was taken.

Two authors, Shaw and Vaccaro, have reported the titers of serums from the ambulatory type of cases. Shaw examined the serum from 525 dockyard employees, all Maltese, in dilutions of 1:30. Of these, 79, or 15 per cent, gave a distinct reaction with *Br. melitensis*. Twenty-two of those showing marked reactions were selected for bacteriological examination of the blood and urine. In 10 cases the organism was recovered from the blood and urine, or from either the blood or the urine only. There was a rise of temperature slightly above normal in 5 of these cases, and in 5 of them the temperature remained practically normal. All of these men were working full time, with the exception of one who was on the sick list for three days. Four of them denied ever having had Malta fever.

Vaccaro tested the serums of 180 Italians of various vocations—students, nurses, and laborers—for agglutinins specific to *Br. melitensis* antigen. Fourteen serums gave a positive reaction in dilutions varying from 1:30 to 1:3,000. All of the 14 subjects were apparently in normal condition, free from fever and going daily to their tasks. *Br. melitensis* was isolated from the urine of 1 of them.

Fici cites a number of authors who have reported that *melitensis* is agglutinated in serums of tuberculous patients. Fici himself tested 98 serums from tuberculous patients, for the most part pulmonary cases. His series of dilutions varied from 1:50 to 1:2,000. He tested each serum with 8 or 10 strains. The results were negative for 87 serums (88.77 per cent). Ten serums showed a positive reaction in the lowest dilution in the case of 1, 2, or 3 of the strains. One serum agglutinated all the strains in high dilution, and the conclusion was drawn that the subject had a *melitensis* infection in addition to pulmonary tuberculosis. Fici's general conclusion is that tuberculous serums present no special property toward *Br. melitensis*. He states that in order to avoid incorrect interpretation of results, the agglutination tests should be carried out with several strains and with minimum dilutions of the serum no lower than 1:200.

### INFLUENCE OF TECHNIQUE UPON TITERS OBTAINED.

In comparing Fici's figures with those of the other authors just quoted, it is to be observed that if his recommendation were followed, and only reactions in dilutions of 1:200 or higher were considered, a large proportion of the cases reported by the other authors would be overlooked. Apparently Fici used some method quite different from

that in general use. As an example of variation in one single factor involved in the agglutinin test, some figures are given in Table 1 which show variations in titer depending upon variation in the density of the antigen. Theoretically, a serum which contains just enough agglutinin to give a positive reaction in a given dilution when the density of the antigen is 1,000 parts per million would give a positive reaction in twice as high a dilution if the density of the antigen were reduced by one-half, provided that the other conditions of the test remained the same. The table shows that in actual practice the results approximate the theoretical calculation. Thus it is shown that the figures of different workers can not be accurately compared unless the conditions under which the tests were carried out were similar. The titers of Malta fever serums obtained at the Hygienic Laboratory appear to run through about the same range as those reported by Birt and Lamb, Nicolle, Bassett-Smith, and various other workers.

## Experimental Work.

The data presented in this paper were obtained by testing 500 human serums, from patients suffering from a variety of diseases, for agglutinins specific for *Br. melitensis* antigen.

### SERUMS.

The serums were taken in various hospitals for the Wassermann test as a part of the regular diagnostic procedure. One hundred and four of the serums were taken at the Naval Hospital in Washington, D. C. The remainder were sent to the Hygienic Laboratory from many places in the northeastern part of the United States, most of them from veterans' hospitals. The serums obtained from the Naval Hospital were tested without heating. The remainder were inactivated at 56° C. for 30 minutes.

Tests were made in dilutions of 1 to 5, 10, 20, 40, and 80.

### ANTIGENS.

The method of preparation of the antigen and the technique followed in carrying out the tests were described in a previous publication (Evans, 1923). Reference to that paper will be made frequently in the following pages.

Strains of *Br. melitensis* of human origin were used for the antigen. Some of the serums were tested with strain 451, which is of the *melitensis* A variety, and some were tested with strain 455, which is of the *abortus* variety. It was shown in the earlier publication that the simple agglutination test does not differentiate between these two varieties of *Br. melitensis*, and control tests with the antigens used showed that duplicate tests with the two antigens gave results as nearly alike as duplicate tests with either one.

## RESULTS.

Out of the 500 serums tested, 59, or 11.8 per cent, were positive in dilutions of 1 to 5 or higher. (Sedimentation of 75 per cent or more of the antigen was considered a positive reaction.) The titers for those serums which gave a positive reaction are given in Table 2, together with the diagnosis of those cases for which a report could be obtained.

The data presented in Table 2 may be summarized as follows:

43 serums were positive in the 1:5 dilution.
11 serums were positive in the 1:10 dilution.
2 serums were positive in the 1:20 dilution.
2 serums were positive in the 1:40 dilution.
1 serum was positive in the 1:320 dilution.

## DISCUSSION OF THE POSITIVE RESULTS.

Nègre and Raynaud have reported that about 50 per cent of unheated normal human serums will react with *Br. melitensis* in dilutions of 1:50 or 1:100, and that positive reactions are even more frequent in serums from febrile cases, but that these false positive reactions are avoided if the serums are heated to 56° C.

Under the conditions of the test as applied to the 500 serums here considered, inactivation of the serum did not reduce the percentage of positive results. In fact, it happened that the inactivated serums gave a higher percentage of positive reactions than those which had not been inactivated. Of the 396 heated serums, 49, or 12.37 per cent, gave positive reactions, whereas 10 of 104, or 9.61 per cent, of the unheated serums gave a positive reaction.

The case from which the serum showed a titer of 1:320 will be considered further on. The significance of the positive reactions in low dilutions of the remaining 58 serums is problematical. There are four possible explanations for the reactions: (1) The reactions may not be specific; (2) the agglutinins may have been acquired in a secondary manner by absorption in the intestines from the agglutinins present in milk that had been ingested; (3) the agglutinins may have been produced as the result of an infection sometime in the past; (4) they may indicate a present infection. It may be that one explanation would apply in some cases and another explanation in other cases.

It is possible that some of the reactions may not be specific; although it is to be borne in mind that when nonspecific agglutinins reacting with *Br. melitensis* have been reported in the literature, in no case has the possibility been considered that they may have been the result of infection with the *abortus* variety of the organism in cow's milk.

It does not appear reasonable to assume that any considerable titer of agglutinins could be acquired by absorption in the intestines from agglutinins in ingested milk; for, according to Smith, Orcutt, and Little, the titer of agglutinins in cow's milk is rarely higher than 1:40. Two of the serums (Nos. 845 and 1385) gave positive reactions in the 1:40 dilutions. It is difficult to conceive that a man could passively accumulate in his serum as high a titer of agglutinins as are commonly present in milk.

In view of the fact that the *abortus* variety of *Br. melitensis* is common in cow's milk, and has been shown to be pathogenic for man, the most probable explanation of the positive reactions in the 58 serums is that they are due to an infection, past or present, with the specific organism. In regions where Malta fever is endemic, most authorities would consider the titer of 1 to 40 found in the case of the serums from two of the patients as indicative of a *melitensis* infection, and the lower titers of 1 to 5, 1 to 10, and 1 to 20 would be regarded by most workers as sufficient to suggest such an infection.

The positive results obtained with serums Nos. 1385 and 1387, having titers of 1 to 20 and 1 to 40, respectively, were reported to the medical officer in charge of the subdistrict office of the United States Veterans' Bureau, which submitted the samples. A letter in reply stated that the positive Malta fever agglutination reactions had been confirmed.

That a *Br. melitensis* infection could occur without any notable illness was shown by the work of Shaw and by that of Vaccaro. By agglutination reactions and by cultivation of the organism from blood or from the urine, these authors (previously quoted) showed that apparently healthy persons living in regions where Malta fever is endemic may be carriers of *Br. melitensis* infection. The fact that Malta fever is very little known in this country leads to the belief that the bovine type of *Br. melitensis* is less virulent for man than the caprine type. If strains of the variety known to be highly infectious for man can produce a very mild type of disease, it seems quite probable that strains of the presumably less virulent variety also may produce infections so mild that they are commonly ignored or undiagnosed.

The results from a group of serums from Alexandria, Va., may be considered together and compared with those from the remainder of the serums. At the time when the serums were tested, the milk supply of Alexandria was not under municipal control. Contagious abortion was known to exist on the farms in the surrounding country. Very likely a considerable proportion of the Alexandria patients were using raw cow's milk containing the abortus variety of *Br. melitensis*. Out of 51 serums from Alexandria, 12, or 23.5 per cent, were positive in a dilution of 1 to 5 or higher; out of the remaining 449 serums,

47, or 10.46 per cent, were positive. This comparison suggests again that *Br. melitensis* in raw cow's milk may be responsible for the positive results obtained when human serums are tested for agglutinins specific to that organism.

## THE ABORTUS VARIETY OF BR. MELITENSIS AS THE CAUSE OF HUMAN CASES OF MALTA FEVER.

In the literature reviewed in the preceding pages a number of instances are cited which indicate that some of the human cases of Malta fever on record may have received their infection from cow's milk. Moreover, a strain of *Br. melitensis* of human origin obtained from Europe was identified by Feusier and Meyer as belonging to the *abortus* variety, and their results were confirmed by the present writer in a study reported in the earlier publication. In this connection the Baltimore case of Malta fever reported by Keefer is of much interest, because it occurred in a locality where the disease is practically unknown. In so far as the patient was aware, the infection could not have come from goats; and the organism cultivated from the blood was identified by the writer as belonging to the *abortus* variety of *Br. melitensis*. Since the findings in this case offer conclusive evidence that the *abortus* variety of *Br. melitensis* is sometimes pathogenic for man, full data regarding the strains are presented in Tables 3, 4, and 5. The history of the strains used for comparison and their serological classification are given in the earlier publication. (Strain 455 is from the Baltimore patient; strain 426 is Feusier and Meyer's human strain of the *abortus* variety; strains 456 and 460 are from cases of bovine abortion; strain 428 is a European human strain of the *melitensis* A variety; and strain 451 is a human strain of the *melitensis* A variety from Phoenix, Ariz.) The technique employed in carrying out the agglutinin absorption test was described in the earlier publication.

The data in the three tables show that the human strains 426 and 455 absorb the same quantity of agglutinins from the serums as the bovine strains 456 and 460, and they are distinctly differentiated from the strains of the *melitensis* A variety by the quantity of agglutinins absorbed. The same results were obtained irrespective of whether the serum used for the absorptions was homologous to the human strain or to the bovine strain. When a serum of the *melitensis* A variety was used for the absorptions, the human strains 426 and 455 were again shown to behave like the bovine strains, but unlike the human strains of the *melitensis* A variety.

The data leave no doubt that the human strains 426 and 455 are serologically identical with the group designated as the *abortus* variety, which includes the majority of bovine strains.

One of the 500 serums tested gave a positive reaction in dilutions as high as 1:320. A second sample of serum was obtained, and the positive results were confirmed with the inactivated serum as well as with the fresh serum. In our search through the literature the highest titer considered the minimum necessary for conclusive evidence of Malta fever which was found was the 1:200 requirement of Fici. Hence, in regions where it is endemic, a diagnosis of Malta fever in this case would be unquestioned. The case was ambulatory, and the medical officers who made the examination found no clinical symptoms which would lead to the diagnosis of any other disease. Following the positive finding in the serological test, they believed it to be a case of true Malta fever. According to the patient's statement he was in the habit of drinking raw cow's milk. So far as he knew, he had never drunk goat's milk nor eaten cheese made from goat's milk, and he had never come in contact with goats.

The serological type of the infecting organism was determined in the following manner: The agglutinins from one sample of the serum were absorbed with an antigen of the *abortus* variety of *Br. melitensis*, and those from another sample were absorbed with an antigen of the *melitensis* A variety. The density of the absorbing antigens was equivalent to 40,000 parts per million of the silica standard, and the absorption was carried out in a 1:5 dilution of the serum. It was shown in the previous publication that under these conditions the agglutinins are completely absorbed from any *melitensis* serum of a titer of 1 to 640 or less if the antigen and antibody are homologous. The simple agglutination test was carried out with the absorbed serums, using both varieties of antigens.

The results of the absorption tests show that the infection was of the *abortus* (bovine) variety of *Br. melitensis*. The data from which this conclusion was drawn are brought together in Table 6. The higher titer of the unabsorbed serum when tested with the *melitensis* A variety as compared with the titer when tested with the *abortus* variety is of no significance, for it was shown in a previous publication that the titer of a serum of either variety is frequently higher when tested with the heterologous antigen.

When the serum was absorbed with the *melitensis* A variety of antigen, a part of the agglutinins specific to the *abortus* variety failed to be removed, which shows that the infection was not of the *melitensis* A variety. Absorption of the serum with the *abortus* variety of antigen removed all agglutinins from the serum, showing that the antibodies and antigen were homologous and that the infection in this case was with the *abortus* variety.

**Summary.**

Five hundred human serums from patients suffering with a variety of diseases were tested for agglutinins specific to *Br. melitensis*. Fifty-nine, or 11.8 per cent, gave a definitely positive reaction in dilutions of 1 to 5 or higher.

One serum had a titer of 1:320, which would lead to an unquestioned diagnosis of Malta fever in regions where the disease is endemic. The patient was unaware of any possibility of having contracted an infection from goats. He was in the habit of drinking raw cow's milk. Absorption tests with the serum showed that this patient was infected with the *abortus* (bovine) variety of *Br. melitensis*.

The titers of the remaining 58 serums which gave positive reactions varied from 1:5 to 1:40. The suggested explanation for these positive reactions is that the agglutinins were produced as a specific response to *Br. melitensis* ingested in cow's milk, although such an infection may not necessarily have caused a notable illness.

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TABLE 1.—*Effect of the density of Br. melitensis antigen on the titer of the serum.*

| Serum. | Density in parts per million. | Serum diluted 1 to— | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10 | 20 | 40 | 80 | 160 | 320 | 640 | 1,280 | 2,560 | 5,120 | 10,240 | 20,480 | 40,960 |
| B. S. | 1,000 | .... | .... | .... | .... | .... | .... | [1] 4 | 4 | 4 | 3 | 0 | 0 | 0 |
| | 500 | .... | .... | .... | .... | .... | .... | 4 | 4 | 4 | 4 | 2 | 0 | 0 |
| | 250 | .... | .... | .... | .... | .... | .... | 4 | 4 | 4 | 4 | 4 | 2 | 0 |
| St. L. | 1,000 | .... | .... | .... | .... | 4 | 4 | 2 | 0 | 0 | 0 | 0 | ..... | ..... |
| | 500 | .... | .... | .... | .... | 4 | 4 | 4 | 2 | 0 | 0 | 0 | ..... | ..... |
| | 250 | .... | .... | .... | .... | 4 | 4 | 4 | 3 | 2 | 0 | 0 | ..... | ..... |
| E. | 1,000 | 2 | 3 | 3 | 1 | 0 | 0 | 0 | ..... | ..... | ..... | ..... | ..... | ..... |
| | 500 | 1 | 2 | 3 | 2 | 0 | 0 | 0 | ..... | ..... | ..... | ..... | ..... | ..... |

[1] 4, complete sedimentation: 3, supernatant turbidity as in a control tube containing 25 per cent as much antigen as in the tubes in which the test was carried out: 2, supernatant turbidity as in a control tube containing 50 per cent of the antigen; 1, supernatant turbidity as in a control tube containing 75 per cent of the antigen.

TABLE 2.—*Titers of the positive serums and diagnoses of the cases.*

SERUMS WHICH WERE NOT HEATED.

| Number of the serum. | Titer. | Diagnosis of the case. |
|---|---|---|
| 5A | 1:5 | Cerebrospinal syphilis(?). |
| 7A | 1:5 | |
| 15A | 1:5 | Pleurisy with effusion. |
| 16A | 1:320 | (See the discussion in the text.) |
| 20A | 1:5 | Advanced pulmonary tuberculosis. |
| 21A | 1:10 | Mental deficiency(?). |
| 2C | 1:10 | Admitted with influenza. Chronic bronchitis. |
| 12C | 1:10 | Fibroid tuberculosis. |
| 13C | 1:5 | Tuberculosis(?). |
| 4D | 1:10 | Active pulmonary tuberculosis. |

SERUMS WHICH WERE HEATED TO 56° C. FOR 30 MINUTES.

| | | |
|---|---|---|
| 845 | 1:40 | Dementia præcox. |
| 876 | 1:5 | |
| 893 | 1:5 | |
| 902 | 1:5 | |
| 904 | 1:10 | Chancroid; syphilis(?). |
| 908 | 1:5 | Iritis; hypertension; nephritis. |
| 910 | 1:5 | |
| 914 | 1:5 | Constitutional psychopathic inferiority; chronic bronchitis; mental deficiency. |
| 915 | 1:10 | |
| 917 | 1:5 | Mental deficiency; effort syndrome; neurosyphilis(?). |
| 919 | 1:5 | |
| 920 | 1:5 | |
| 928 | 1:5 | Psychosis, undiagnosed; pulmonary tuberculosis, apparently arrested. |
| 935 | 1:10 | |
| 937 | 1:5 | |
| 950 | 1:5 | Acne, chest. |
| 955 | 1:5 | |
| 956 | 1:5 | |
| 961 | 1:10 | Old fracture of left leg; hysteria. |
| 972 | 1:5 | |
| 993 | 1:5 | Chronic amygdalitis; valvular heart disease; suppurative otitis media. |
| 994 | 1:5 | |
| 999 | 1:5 | |
| 1040 | 1:5 | Chancroid. |
| 1073 | 1:5 | Dementia præcox. |
| 1085 | 1:5 | |
| 1088 | 1:5 | |
| 1089 | 1:5 | |
| 1100 | 1:10 | Mental deficiency; acute pharyngitis. |
| 1104 | 1:10 | |
| 1133 | 1:5 | Chronic rhinitis; pulmonary fibrosis. |
| 1144 | 1:5 | Lues. |
| 1162 | 1:5 | Mental deficiency. |
| 1167 | 1:5 | Dementia præcox. |
| 1183 | 1:5 | Chronic arthritis; bronchitis. |

TABLE 2.—*Titers of the positive serums and diagnoses of the cases*—Continued.

SERUMS WHICH WERE HEATED TO 56° C. FOR 30 MINUTES.

| Number of the serum. | Titer. | Diagnosis of the case. |
|---|---|---|
| 1208 | 1:20 | Pulmonary tuberculosis. |
| 1210 | 1:5 | |
| 1232 | 1:5 | |
| 1235 | 1:5 | |
| 1264 | 1:10 | |
| 1266 | 1:5 | |
| 1344 | 1:5 | |
| 1372 | 1:5 | |
| 1373 | 1:5 | Sacro-iliac sprain; varicocele. |
| 1377 | 1:5 | Hypertrophy of heart; chronic arthritis; rhinitis. |
| 1385 | 1:40 | Fracture of right femur. |
| 1387 | 1:20 | Constitutional inferiority. |
| 1394 | 1:5 | Entero-colitis. |
| 1403 | 1:5 | Pulmonary tuberculosis. |

TABLE 3.—*Agglutination of the homologous antigen in the serum of the Baltimore patient after absorption by various strains of bovine and human origin.*

| Condition of serum. | Source of the absorbing strain. | Serological type of absorbing strains. | Serum diluted 1 to— | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 50 | 100 | 200 | 400 | 800 | 1,600 | 3,200 | 6,400 |
| Not absorbed | | | [1]3 | 3 | 4 | 4 | 4 | 4 | 3 | 0 |
| Absorbed by strain 455[2] | Human (homologous to the serum). | Abortus | 3 | 3 | 1 | 0 | 0 | 0 | 0 | 0 |
| Absorbed by strain 426 | Human | do | 3 | 3 | 1 | 0 | 0 | 0 | 0 | 0 |
| Absorbed by strain 456 | Bovine | do | 3 | 3 | 1 | 0 | 0 | 0 | 0 | 0 |
| Absorbed by strain 428 | Human | Melitensis A | 3 | 4 | 4 | 4 | 3 | 0 | 0 | 0 |
| Absorbed by strain 451 | do | do | 4 | 4 | 4 | 4 | 3 | 0 | 0 | 0 |

[1] See Table 1 for significance of figures.
[2] Absorptions were accomplished by adding 0.2 c.c. of serum to 4.8 c. c. of antigen of a density of 5,000 parts per million.

TABLE 4.—*Agglutination of the homologous antigen in the serum of a rabbit injected with the bovine strain 456, after absorption by various strains of human and bovine origin.*

| Condition of the serum. | Source of the absorbing strain. | Serological type of absorbing strain. | Serum diluted 1 to— | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 40 | 80 | 160 | 320 | 640 | 1,280 | 2,560 | 5,120 | 10,240 |
| Not absorbed | | | [1]4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 0 |
| Absorbed by strain 456[2] | Bovine (homologous to the serum). | Abortus | 4 | 3 | 0 | 0 | 0 | 0 | 0 | ..... | ..... |
| Absorbed by strain 426 | Human | do | 4 | 2 | 0 | 0 | 0 | 0 | 0 | ..... | ..... |
| Absorbed by strain 455 | Human (Baltimore patient). | do | 4 | 3 | 0 | 0 | 0 | 0 | 0 | ..... | ..... |
| Absorbed by strain 460 | Bovine | do | 4 | 3 | 0 | 0 | 0 | 0 | 0 | ..... | ..... |

[1] See Table 1 for significance of the figures.
[2] Absorptions were accomplished by adding 0.2 c. c. of serum to 3.8 c. c. of antigen of a density of 40,000 parts per million.

TABLE 5.—*Agglutination of the homologous antigen in the serum of a rabbit injected with strain 451, of the melitensis A variety, after absorption by various strains of human and bovine origin.*

| Condition of the serum. | Source of the absorbing strain. | Serological type of absorbing strain. | Serum diluted 1 to— | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 40 | 80 | 160 | 320 | 640 | 1,280 | 2,560 | 5,120 | 10,240 |
| Not absorbed | | | [1] 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 0 |
| Absorbed by strain 451 [2]. | Human (homologous to the serum). | Melitensis A. | 3 | 3 | 3 | 0 | 0 | 0 | 0 | ..... | ..... |
| Absorbed by strain 428 | Human | do | 3 | 4 | 3 | 0 | 0 | 0 | 0 | ..... | ..... |
| Absorbed by strain 426 | do | Abortus | 3 | 4 | 4 | 4 | 4 | 3 | 1 | ..... | ..... |
| Absorbed by strain 455 | Human (Baltimore patient). | do | 3 | 4 | 4 | 4 | 4 | 4 | 1 | ..... | ..... |
| Absorbed by strain 456 | Bovine | do | 3 | 4 | 4 | 4 | 4 | 2 | 0 | ..... | ..... |
| Absorbed by strain 460 | do | do | 3 | 4 | 4 | 4 | 4 | 4 | 0 | ..... | ..... |

[1] See Table 1 for significance of the figures.
[2] Conditions for the absorptions were the same as in Table 5.

TABLE 6.—*Agglutination tests with serum 16 A after the absorptions show that it contained agglutinins specific to the abortus variety of Br. melitensis.*

| Condition of the serum. | Antigen used for agglutination tests. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 451 (melitensis A variety). Serum diluted 1 to— | | | | | | | 426 [1] (abortus variety). Serum diluted 1 to— | | | | | |
| | 10 | 20 | 40 | 80 | 160 | 320 | 640 | 10 | 20 | 40 | 80 | 160 | 320 | 640 |
| Not absorbed | ..... | [2] 4 | 4 | 4 | 4 | 3 | 0 | ..... | 4 | 4 | 4 | 3 | 0 | ..... |
| Absorbed by antigen 451 (melitensis A variety) | 0 | 0 | 0 | 0 | 0 | ..... | ..... | 3 | 3 | 3 | 0 | ..... | ..... | ..... |
| Absorbed by antigen 426 (abortus variety) | 0 | 0 | 0 | 0 | 0 | ..... | ..... | 0 | ..... | ..... | ..... | ..... | ..... | ..... |

[1] Antigen 455 of the abortus variety was used in carrying out the test with the unabsorbed serum.
[2] See Table 1 for the significance of the figures.

# THE NEW BALDWIN-WOOD WEIGHT-HEIGHT-AGE TABLES AS AN INDEX OF NUTRITION.

## THE APPLICATION OF THE BALDWIN-WOOD STANDARD OF NUTRITION TO 506 NATIVE WHITE CHILDREN WITHOUT PHYSICAL DEFECTS AND WITH "GOOD" OR "EXCELLENT" NUTRITION AS JUDGED FROM CLINICAL EVIDENCE.[1]

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Since the publication some months ago of an article [2] by the writers comparing three different standards of nutrition, a new standard, sponsored by the American Child Health Association, the weight-height-age tables by Baldwin and Wood,[3] has been offered for con-

[1] From Field Investigations in Child Hygiene, United States Public Health Service, in cooperation with the Statistical Office, United States Public Health Service. This is the fourth article in a series on weight and height of school children. For the other articles see Public Health Reports, vol. 37, No. 20, May 19, 1922 (Reprint 750); vol. 38, No. 2, Jan. 12, 1923 (Reprint 809); and vol. 38, No. 23, June 8, 1923 (Reprint 842).

[2] Indices of Nutrition—The Application of Certain Standards of Nutrition to 506 Native White Children without Physical Defects and with "Good" or "Excellent" Nutrition as Judged from Clinical Evidence. Pub. Health Rep., vol. 38, No. 23, June 8, 1923 (Reprint 842).

[3] Weight-Height-Age Tables—Tables for Boys and Girls of School Age, prepared by Bird T. Baldwin, Ph. D., and Thomas D. Wood, M. D.; published by the American Child Health Association as a supplement to the July, 1923, issue of Mother and Child.

sideration. In the study mentioned three different standards of nutrition were compared: (1) Wood's "Right Height and Weight for Boys and Girls"; (2) Dreyer's standard, based on trunk length and chest circumference; and (3) Pirquet's pelidisi standard.

The Baldwin-Wood weight-height-age tables are arranged in the same form as the "right" height and weight tables by Dr. Thomas D. Wood, which were examined in the previous study. It is of special interest, therefore, to compare the percentage of underweight found according to the new Baldwin-Wood standard with that found by using the Wood standard.

The comparison and test made in the previous study of the three standards mentioned consisted of the direct application of these standards to a selected group of healthy children. Similarly it is purposed here to apply the Baldwin-Wood standard to a group of healthy children as was done in the study of the other three standards. The following paragraph from the article reporting that study will give the method here employed:

"In the present study three well-known indices of nutrition in which *weight* is the physical characteristic primarily employed as the measure of health or, conversely, of deviations from health, have been selected for test and comparison. In general, the procedure was as follows: (1) To select children who, upon a detailed physical examination by experienced medical men, were found to be without defect or evidence of disease, as the basic or experimental (from the statistical point of view) group; (2) to apply each of the three indices to the individuals within this group; (3) to compare the results of the application of the three indices, in order to ascertain how far they agree. In the selection of the basic group of children, a further limitation was introduced, namely, all children who, even without physical defect or evidence of disease, were graded upon the basis of clinical evidence as 'fair,' 'poor,' and 'very poor' in nutrition were excluded. Since two classes of gradation according to nutrition ('good' and 'excellent') were included, the results of the study suggest in some degree the applicability of a modified Dunfermline scale. It was assumed, at the beginning of this study, that any satisfactory standard of physical fitness should work in two ways: it should include all or very nearly all of a group of children who, judged by the best standard available (a careful examination by qualified medical inspectors experienced in this particular work), are found beyond reasonable question to be in a satisfactory, if not superior, condition of health; and, conversely, it should not include any large proportion of a group which, by the same method, is found to be in ill health. The principle of the test would appear to be more than fair, since all 'border-line' cases are excluded from consideration."

The present study is merely an extension of the former one. It consists of applying the new Baldwin-Wood tables to the same group of healthy children and comparing the results with those obtained by its precursor, the Wood tables. Inasmuch as the new Baldwin-Wood tables are similar in form and principle to the Wood tables used in the previous study, the comparison is limited to these tables.

As stated in the former article, the 506 children included in these studies were all native white of native parentage and native grandparentage, without physical defects, and were judged as of "good" or "excellent" nutrition on clinical evidence. For particulars as to State of residence, sex, and age of the children in the group, and the methods of making the measurements, reference is made to the preceding article, and the discussion need not be repeated here.

## BALDWIN-WOOD STANDARD.

According to the Baldwin-Wood standard based on the weight for height at different ages for each sex, 81 (16 per cent) of these 506 children who were found to be in good health and free from physical defect on medical examination, were more than 10 per cent underweight. Among the children classed on clinical evidence as of "excellent" nutrition, 2 per cent were underweight; but among those of "good" nutrition 22 per cent were underweight. Both groups, it should be remembered, were above the average as measured by clinical evidence as ascertained by a medical examination.

TABLE I.—*Baldwin-Wood weight-height-age tables applied to children without physical defects and with "good" or "excellent" nutrition as judged from clinical evidence.*

Percentage of 506 children of native white ancestry (parents and grandparents all born in the United States) who were more than 10 per cent underweight, and percentage who were more than 20 per cent overweight, according to the Baldwin-Wood weight-height-age tables, by sex and nutrition groups.

| Nutrition as judged from clinical evidence. | Percentage of children— | | | | | | Total number of children considered. | | |
|---|---|---|---|---|---|---|---|---|---|
| | Underweight (more than 10 per cent under the Baldwin-Wood standard). | | | Overweight (more than 20 per cent over the Baldwin-Wood standard). | | | | | |
| | Both sexes. | Boys. | Girls. | Both sexes. | Boys. | Girls. | Both sexes. | Boys. | Girls. |
| Both nutrition groups | 16.0 | 11.5 | 19.7 | 4.7 | 4.4 | 5.0 | 506 | 227 | 279 |
| Excellent | 2.0 | 1.6 | 2.3 | 14.2 | 13.1 | 14.9 | 148 | 61 | 87 |
| Good | 21.8 | 15.1 | 27.6 | .8 | 1.2 | .5 | 358 | 166 | 192 |

TABLE II.—*Baldwin-Wood weight-height-age tables applied to children without physical defects and with "good" or "excellent" nutrition as judged from clinical evidence.*

Percentage of 506 children of native white ancestry (parents and grandparents all born in the United States) who were more than 10 per cent underweight, and percentage who were more than 20 per cent overweight, according to the Baldwin-Wood weight-height-age tables, by sex and age groups.

| Age nearest birthday. | Percentage of children— | | | | | | Total number of children considered. | | |
|---|---|---|---|---|---|---|---|---|---|
| | Underweight (more than 10 per cent under the Baldwin-Wood standard). | | | Overweight (more than 20 per cent over the Baldwin-Wood standard). | | | | | |
| | Both sexes. | Boys. | Girls. | Both sexes. | Boys. | Girls. | Both sexes. | Boys. | Girls. |
| All ages | 16.0 | 11.5 | 19.7 | 4.7 | 4.4 | 5.0 | 506 | 227 | 279 |
| 6 to 8 | 13.9 | 20.0 | 10.2 | 1.3 | 3.3 | ..... | 79 | 30 | 49 |
| 9 to 11 | 16.7 | 10.1 | 21.8 | 5.6 | 3.8 | 6.9 | 180 | 79 | 101 |
| 12 to 14 | 16.1 | 8.3 | 22.9 | 5.9 | 5.2 | 6.4 | 205 | 96 | 109 |
| 15 to 18 | 16.7 | 18.2 | 15.0 | 2.4 | 4.5 | ..... | 42 | 22 | 20 |

Of the boys, 11 per cent were underweight, as were 20 per cent of the girls. Also, as regards overweight, 4 per cent of the boys and 5 per cent of the girls were more than 20 per cent overweight. In other words, a greater percentage of the girls than of the boys were underweight and also a greater percentage were overweight. The fact that girls are found in larger numbers than boys at both the upper and the lower ends of the scale seems to point to greater normal variation in weight rather than to a greater percentage of girls who are really undernourished. Moreover, it should be remembered that this group of children was selected by medical examiners from a much larger number of children, as being in good health and physically fit, every child of even "fair" nutrition being eliminated from this group. Yet 16 per cent are more than 10 per cent below the new Baldwin-Wood standard. This fact seems to throw some doubt on this method of assessing physical fitness and it would therefore seem advisable to examine the method. Three possible errors may arise: (1) The averages may not be applicable, that is, they may represent children of some special class or type different from the general child population; (2) the variation from this average may be improperly fixed—perhaps 10 per cent is too narrow a limit, or perhaps the limit should be a changing one for different ages and sexes;[4] (3) it may be that deviation from the average weight for sex, age, and height is not a criterion of physical fitness—that is, within broad limits a deviation from the average weight may not be a matter of ill health or malnutrition.

## COMPARISON OF THE NEW BALDWIN-WOOD STANDARD AND THE WOOD STANDARD.

According to Wood's "right" weight standard, 20 per cent of these 506 children were more than 10 per cent underweight; but according to the new Baldwin-Wood standard only 16 per cent were more than 10 per cent underweight. Of the 102 children who were underweight according to the Wood standard, 80 children were underweight according to the new Baldwin-Wood standard, and the other 22 children were below the average but within the 10 per cent limit.

[4] It should be said that no definite limit is prescribed for the use of the Baldwin-Wood tables, but in applying them in this study the limits of 10 per cent underweight and 20 per cent overweight were taken, because these are the limits which have been generally used in school health work. In an address before the International Health Congress, San Francisco, July 4, 1923 (The Use and Abuse of Weight-Height-Age-Tables as Indexes of Health and Nutrition, by Bird T. Baldwin, Jour. A. M. A., vol. 82, No. 1, Jan. 5, 1924), Doctor Baldwin stated that "A deviation of only a few pounds from normal weight is not considered significant: but children under 10 years who are 6 per cent or more underweight for their height and age, and those over 10 years who are 8 per cent or more underweight for their height and age, are likely to be in need of medical attention. Children who are 15 per cent overweight for their height and age may also be in need of medical attention."

If the narrower limits of 6 to 8 per cent underweight and 15 per cent overweight, as suggested by Doctor Baldwin, had been used in this study, it is obvious that a much larger percentage of these children would have been classed as underweight and in need of medical attention.

Among the 227 boys, 43 (19 per cent) were more than 10 per cent below Wood's standard, but only 26 (11 per cent) were more than 10 per cent below the new Baldwin-Wood standard. Among the 279 girls, 59 (21 per cent) were more than 10 per cent below Wood's standard as against 55 (20 per cent) according to the Baldwin-Wood standard. The two tables seem to differ more for the boys than for the girls, but in both cases the percentage of children who were underweight is less according to the new Baldwin-Wood standard than according to the Wood standard.

TABLE III.—*A comparison of the Baldwin-Wood weight-height-age tables with the Wood "right" weight tables.*

506 children of native white ancestry (parents and grandparents all born in the United States) without physical defects and judged as "excellent" or "good" in nutrition on clinical evidence by medical examiners (U. S. P. H. S.), classified according to the per cent deviation from the Baldwin-Wood weight-height-age tables and Wood's table of "right" weight for sex, age, and height.

| Per cent deviation from the Baldwin-Wood standard. | Per cent deviation from Wood's "right" weight tables. | | | | |
|---|---|---|---|---|---|
| | Total. | More than 10 per cent under. | 1 to 10 per cent under. | 0 to 20 per cent over. | More than 20 per cent over. |
| **BOTH SEXES.** | | | | | |
| Total | 506 | 102 | 236 | 146 | 22 |
| More than 10 per cent under | 81 | 80 | 1 | ..... | ..... |
| 1 to 10 per cent under | 225 | 22 | 198 | 5 | ..... |
| 0 to 20 per cent over | 176 | ..... | 37 | 139 | ..... |
| More than 20 per cent over | 24 | ..... | ..... | 2 | 22 |
| **BOYS.** | | | | | |
| Total | 227 | 43 | 119 | 55 | 10 |
| More than 10 per cent under | 26 | 26 | ..... | ..... | ..... |
| 1 to 10 per cent under | 113 | 17 | 96 | ..... | ..... |
| 0 to 20 per cent over | 78 | ..... | 23 | 55 | ..... |
| More than 20 per cent over | 10 | ..... | ..... | ..... | 10 |
| **GIRLS.** | | | | | |
| Total | 279 | 59 | 117 | 91 | 12 |
| More than 10 per cent under | 55 | 54 | 1 | ..... | ..... |
| 1 to 10 per cent under | 112 | 5 | 102 | 5 | ..... |
| 0 to 20 per cent over | 98 | ..... | 14 | 84 | ..... |
| More than 20 per cent over | 14 | ..... | ..... | 2 | 12 |

## APPENDIX.

# The following tables show in greater detail the data which have been presented in summary form in the foregoing pages.

TABLE IV.—*Baldwin-Wood weight-height-age tables applied to children 6–18 years of age without physical defects and with "good" or "excellent" nutrition as judged from clinical evidence.*

Frequency distribution of 506 children of native white ancestry (parents and grandparents all born in the United States) according to the per cent deviation from the Baldwin-Wood weight-height-age tables, the children being classified according to sex and single years of age.

BOTH NUTRITION GROUPS.

| Percentage deviation from the Baldwin-Wood standard. | All ages. | Number of children at each age (nearest birthday) who are each given per cent above or below the Baldwin-Wood standard weight. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| **BOTH SEXES.** | | | | | | | | | | | | | | |
| Total | 506 | 11 | 32 | 36 | 38 | 65 | 77 | 78 | 67 | 60 | 22 | 13 | 6 | 1 |
| More than 20 per cent under | 6 | .... | .... | .... | .... | .... | .... | 1 | 2 | 2 | 1 | .... | .... | .... |
| 16 to 20 per cent under | 18 | .... | 2 | 2 | .... | 2 | 3 | .... | 3 | 3 | 2 | .... | 1 | .... |
| 11 to 15 per cent under | 57 | 1 | 1 | 5 | 2 | 9 | 14 | 7 | 8 | 7 | .... | 3 | .... | .... |
| 6 to 10 per cent under | 119 | 1 | 8 | 4 | 11 | 12 | 17 | 25 | 16 | 14 | 4 | 3 | 3 | 1 |
| 1 to 5 per cent under | 106 | 3 | 10 | 8 | 8 | 13 | 15 | 15 | 11 | 11 | 8 | 3 | 1 | .... |
| 0 to 5 per cent over | 109 | 4 | 3 | 9 | 13 | 22 | 20 | 14 | 8 | 10 | 4 | 2 | .... | .... |
| 6 to 10 per cent over | 36 | 2 | 3 | 7 | .... | 4 | 2 | 5 | 9 | 3 | 1 | .... | .... | .... |
| 11 to 15 per cent over | 22 | .... | 4 | .... | .... | 1 | 2 | 3 | 5 | 5 | 1 | .... | 1 | .... |
| 16 to 20 per cent over | 9 | .... | .... | 1 | .... | .... | .... | 3 | 1 | 2 | 1 | 1 | .... | .... |
| 21 to 25 per cent over | 9 | .... | .... | .... | 2 | 1 | 1 | 3 | 1 | 1 | .... | .... | .... | .... |
| More than 25 per cent over | 15 | .... | 1 | .... | 2 | 1 | 3 | 2 | 3 | 2 | .... | 1 | .... | .... |
| **BOYS.** | | | | | | | | | | | | | | |
| Total | 227 | 5 | 14 | 11 | 17 | 35 | 27 | 42 | 27 | 27 | 9 | 8 | 4 | 1 |
| More than 20 per cent under | 1 | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... |
| 16 to 20 per cent under | 5 | .... | 1 | 1 | .... | .... | 1 | .... | .... | .... | 1 | .... | 1 | .... |
| 11 to 15 per cent under | 20 | 1 | 1 | 2 | .... | 5 | 2 | 4 | 1 | 2 | .... | 2 | .... | .... |
| 6 to 10 per cent under | 61 | 1 | 3 | 2 | 7 | 6 | 8 | 17 | 5 | 7 | .... | 2 | 2 | 1 |
| 1 to 5 per cent under | 52 | 1 | 4 | 2 | 4 | 9 | 3 | 8 | 7 | 8 | 3 | 2 | 1 | .... |
| 0 to 5 per cent over | 49 | 2 | 1 | 3 | 5 | 14 | 9 | 5 | 3 | 3 | 3 | 1 | .... | .... |
| 6 to 10 per cent over | 18 | .... | 2 | 1 | .... | .... | 2 | 4 | 7 | 2 | .... | .... | .... | .... |
| 11 to 15 per cent over | 8 | .... | 1 | .... | .... | .... | 1 | 1 | .... | 4 | 1 | .... | .... | .... |
| 16 to 20 per cent over | 3 | .... | .... | .... | .... | .... | .... | 1 | 1 | .... | 1 | .... | .... | .... |
| 21 to 25 per cent over | 1 | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... |
| More than 25 per cent over | 9 | .... | 1 | .... | 1 | 1 | 1 | 2 | 1 | 1 | .... | 1 | .... | .... |
| **GIRLS.** | | | | | | | | | | | | | | |
| Total | 279 | 6 | 18 | 25 | 21 | 30 | 50 | 36 | 40 | 33 | 13 | 5 | 2 | .... |
| More than 20 per cent under | 5 | .... | .... | .... | .... | .... | .... | 1 | 1 | 2 | 1 | .... | .... | .... |
| 16 to 20 per cent under | 13 | .... | 1 | 1 | .... | 2 | 2 | .... | 3 | 3 | 1 | .... | .... | .... |
| 11 to 15 per cent under | 37 | .... | .... | 3 | 2 | 4 | 12 | 3 | 7 | 5 | .... | 1 | .... | .... |
| 6 to 10 per cent under | 58 | .... | 5 | 2 | 4 | 6 | 9 | 8 | 11 | 7 | 4 | 1 | 1 | .... |
| 1 to 5 per cent under | 54 | 2 | 6 | 6 | 4 | 4 | 12 | 7 | 4 | 3 | 5 | 1 | .... | .... |
| 0 to 5 per cent over | 60 | 2 | 2 | 6 | 8 | 8 | 11 | 9 | 5 | 7 | 1 | 1 | .... | .... |
| 6 to 10 per cent over | 18 | 2 | 1 | 6 | .... | 4 | .... | 1 | 2 | 1 | 1 | .... | .... | .... |
| 11 to 15 per cent over | 14 | .... | 3 | .... | .... | 1 | 1 | 2 | 5 | 1 | .... | .... | 1 | .... |
| 16 to 20 per cent over | 6 | .... | .... | 1 | .... | .... | .... | 2 | .... | 2 | .... | 1 | .... | .... |
| 21 to 25 per cent over | 8 | .... | .... | .... | 2 | 1 | 1 | 3 | .... | 1 | .... | .... | .... | .... |
| More than 25 per cent over | 6 | .... | .... | .... | 1 | .... | 2 | .... | 2 | 1 | .... | .... | .... | .... |

TABLE V.—*Baldwin-Wood weight-height-age tables applied to children 6 to 18 years of age without physical defects and with "good" nutrition as judged from clinical evidence.*

Frequency distribution of 358 children of native white ancestry (parents and grandparents all born in the United States) according to the per cent deviation from the Baldwin-Wood weight-height-age tables, the children being classified according to sex and single years of age.

GOOD NUTRITION.

| Percentage deviation from the Baldwin-Wood standard. | All ages. | Number of children at each age (nearest birthday) who are each given per cent above or below the Baldwin-Wood standard weight. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| **BOTH SEXES.** | | | | | | | | | | | | | | |
| Total | 358 | 8 | 24 | 28 | 28 | 52 | 57 | 48 | 42 | 42 | 14 | 10 | 5 | .... |
| More than 20 per cent under | 6 | .... | .... | .... | .... | .... | .... | 1 | 2 | 2 | 1 | .... | .... | .... |
| 16 to 20 per cent under | 18 | .... | 2 | 2 | .... | 2 | 3 | .... | 3 | 3 | 2 | .... | 1 | .... |
| 11 to 15 per cent under | 54 | 1 | 1 | 4 | 2 | 9 | 13 | 6 | 8 | 7 | .... | 3 | .... | .... |
| 6 to 10 per cent under | 100 | 1 | 8 | 4 | 9 | 11 | 17 | 20 | 12 | 10 | 4 | 2 | 2 | .... |
| 1 to 5 per cent under | 84 | 3 | 8 | 8 | 8 | 11 | 12 | 10 | 8 | 8 | 4 | 3 | 1 | .... |
| 0 to 5 per cent over | 67 | 3 | 3 | 6 | 9 | 14 | 11 | 6 | 4 | 7 | 3 | 1 | .... | .... |
| 6 to 10 per cent over | 15 | .... | .... | 4 | .... | 2 | .... | 4 | 3 | 2 | .... | .... | .... | .... |
| 11 to 15 per cent over | 9 | .... | 2 | .... | .... | 1 | 1 | .... | 2 | 2 | .... | .... | 1 | .... |
| 16 to 20 per cent over | 2 | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | 1 | .... | .... |
| 21 to 25 per cent over | 1 | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... |
| More than 25 per cent over | 2 | .... | .... | .... | .... | 1 | .... | .... | .... | 1 | .... | .... | .... | .... |
| **BOYS.** | | | | | | | | | | | | | | |
| Total | 166 | 4 | 10 | 10 | 13 | 31 | 20 | 28 | 16 | 19 | 5 | 6 | 4 | .... |
| More than 20 per cent under | 1 | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... |
| 16 to 20 per cent under | 5 | .... | 1 | 1 | .... | .... | 1 | .... | .... | .... | 1 | .... | 1 | .... |
| 11 to 15 per cent under | 19 | 1 | 1 | 2 | .... | 5 | 2 | 3 | 1 | 2 | .... | 2 | .... | .... |
| 6 to 10 per cent under | 52 | 1 | 3 | 2 | 6 | 6 | 8 | 13 | 4 | 5 | .... | 2 | 2 | .... |
| 1 to 5 per cent under | 42 | 1 | 4 | 2 | 4 | 8 | 3 | 5 | 5 | 6 | 1 | 2 | 1 | .... |
| 0 to 5 per cent over | 34 | 1 | 1 | 3 | 3 | 11 | 5 | 3 | 2 | 2 | 3 | .... | .... | .... |
| 6 to 10 per cent over | 7 | .... | .... | .... | .... | .... | .... | 3 | 3 | 1 | .... | .... | .... | .... |
| 11 to 15 per cent over | 3 | .... | .... | .... | .... | .... | 1 | .... | .... | 2 | .... | .... | .... | .... |
| 16 to 20 per cent over | 1 | .... | .... | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... |
| 21 to 25 per cent over | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| More than 25 per cent over | 2 | .... | .... | .... | .... | 1 | .... | .... | .... | 1 | .... | .... | .... | .... |
| **GIRLS.** | | | | | | | | | | | | | | |
| Total | 192 | 4 | 14 | 18 | 15 | 21 | 37 | 20 | 26 | 23 | 9 | 4 | 1 | .... |
| More than 20 per cent under | 5 | .... | .... | .... | .... | .... | .... | 1 | 1 | 2 | 1 | .... | .... | .... |
| 16 to 20 per cent under | 13 | .... | 1 | 1 | .... | 2 | 2 | .... | 3 | 3 | 1 | .... | .... | .... |
| 11 to 15 per cent under | 35 | .... | .... | 2 | 2 | 4 | 11 | 3 | 7 | 5 | .... | 1 | .... | .... |
| 6 to 10 per cent under | 48 | .... | 5 | 2 | 3 | 5 | 9 | 7 | 8 | 5 | 4 | .... | .... | .... |
| 1 to 5 per cent under | 42 | 2 | 4 | 6 | 4 | 3 | 9 | 5 | 3 | 2 | 3 | 1 | .... | .... |
| 0 to 5 per cent over | 33 | 2 | 2 | 3 | 6 | 3 | 6 | 3 | 2 | 5 | .... | 1 | .... | .... |
| 6 to 10 per cent over | 8 | .... | .... | 4 | .... | 2 | .... | 1 | .... | 1 | .... | .... | .... | .... |
| 11 to 15 per cent over | 6 | .... | 2 | .... | .... | 1 | .... | .... | 2 | .... | .... | .... | 1 | .... |
| 16 to 20 per cent over | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1 | .... | .... |
| 21 to 25 per cent over | 1 | .... | .... | .... | .... | 1 | .... | .... | .... | .... | .... | .... | .... | .... |
| More than 25 per cent over | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |

TABLE VI.—*Baldwin-Wood weight-height-age tables applied to children 6 to 18 years of age without physical defects and with "excellent" nutrition as judged from clinical evidence.*

Frequency distribution of 148 children of native white ancestry (parents and grandparents all born in the United States) according to the per cent deviation from the Baldwin-Wood weight-height-age tables, the children being classified according to sex and single years of age.

EXCELLENT NUTRITION.

| Percentage deviation from the Baldwin-Wood standard. | All ages. | Number of children at each age (nearest birthday) who are each given per cent above or below the Baldwin-Wood standard weight. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| **BOTH SEXES.** | | | | | | | | | | | | | | |
| Total | 148 | 3 | 8 | 8 | 10 | 13 | 20 | 30 | 25 | 18 | 8 | 3 | 1 | 1 |
| More than 20 per cent under | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| 16 to 20 per cent under | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| 11 to 15 per cent under | 3 | ---- | ---- | 1 | ---- | ---- | 1 | 1 | ---- | ---- | ---- | ---- | ---- | ---- |
| 6 to 10 per cent under | 19 | ---- | ---- | ---- | 2 | 1 | ---- | 5 | 4 | 4 | ---- | 1 | 1 | 1 |
| 1 to 5 per cent under | 22 | ---- | 2 | ---- | ---- | 2 | 3 | 5 | 3 | 3 | 4 | ---- | ---- | ---- |
| 0 to 5 per cent over | 42 | 1 | ---- | 3 | 4 | 8 | 9 | 8 | 4 | 3 | 1 | 1 | ---- | ---- |
| 6 to 10 per cent over | 21 | 2 | 3 | 3 | ---- | 2 | 2 | 1 | 6 | 1 | 1 | ---- | ---- | ---- |
| 11 to 15 per cent over | 13 | ---- | 2 | ---- | ---- | ---- | 1 | 3 | 3 | 3 | 1 | ---- | ---- | ---- |
| 16 to 20 per cent over | 7 | ---- | ---- | 1 | ---- | ---- | ---- | 2 | 1 | 2 | 1 | ---- | ---- | ---- |
| 21 to 25 per cent over | 8 | ---- | ---- | ---- | 2 | ---- | 1 | 3 | 1 | 1 | ---- | ---- | ---- | ---- |
| More than 25 per cent over | 13 | ---- | 1 | ---- | 2 | ---- | 3 | 2 | 3 | 1 | ---- | 1 | ---- | ---- |
| **BOYS.** | | | | | | | | | | | | | | |
| Total | 61 | 1 | 4 | 1 | 4 | 4 | 7 | 14 | 11 | 8 | 4 | 2 | ---- | 1 |
| More than 20 per cent under | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| 16 to 20 per cent over | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| 11 to 15 per cent under | 1 | ---- | ---- | ---- | ---- | ---- | ---- | 1 | ---- | ---- | ---- | ---- | ---- | ---- |
| 6 to 10 per cent under | 9 | ---- | ---- | ---- | 1 | ---- | ---- | 4 | 1 | 2 | ---- | ---- | ---- | 1 |
| 1 to 5 per cent under | 10 | ---- | ---- | ---- | ---- | 1 | ---- | 3 | 2 | 2 | 2 | ---- | ---- | ---- |
| 0 to 5 per cent over | 15 | 1 | ---- | ---- | 2 | 3 | 4 | 2 | 1 | 1 | ---- | 1 | ---- | ---- |
| 6 to 10 per cent over | 11 | ---- | 2 | 1 | ---- | ---- | 2 | 1 | 4 | 1 | ---- | ---- | ---- | ---- |
| 11 to 15 per cent over | 5 | ---- | 1 | ---- | ---- | ---- | ---- | 1 | ---- | 2 | 1 | ---- | ---- | ---- |
| 16 to 20 per cent over | 2 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1 | ---- | 1 | ---- | ---- | ---- |
| 21 to 25 per cent over | 1 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | 1 | ---- | ---- | ---- | ---- | ---- |
| More than 25 per cent over | 7 | ---- | 1 | ---- | 1 | ---- | 1 | 2 | 1 | ---- | ---- | 1 | ---- | ---- |
| **GIRLS.** | | | | | | | | | | | | | | |
| Total | 87 | 2 | 4 | 7 | 6 | 9 | 13 | 16 | 14 | 10 | 4 | 1 | 1 | ---- |
| More than 20 per cent under | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| 16 to 20 per cent | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| 11 to 15 per cent under | 2 | ---- | ---- | 1 | ---- | ---- | 1 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| 6 to 10 per cent under | 10 | ---- | ---- | ---- | 1 | 1 | ---- | 1 | 3 | 2 | ---- | 1 | 1 | ---- |
| 1 to 5 per cent under | 12 | ---- | 2 | ---- | ---- | 1 | 3 | 2 | 1 | 1 | 2 | ---- | ---- | ---- |
| 0 to 5 per cent over | 27 | ---- | ---- | 3 | 2 | 5 | 5 | 6 | 3 | 2 | 1 | ---- | ---- | ---- |
| 6 to 10 per cent over | 10 | 2 | 1 | 2 | ---- | 2 | ---- | ---- | 2 | ---- | 1 | ---- | ---- | ---- |
| 11 to 15 per cent over | 8 | ---- | 1 | ---- | ---- | ---- | 1 | 2 | 3 | 1 | ---- | ---- | ---- | ---- |
| 16 to 20 per cent over | 5 | ---- | ---- | 1 | ---- | ---- | ---- | 2 | ---- | 2 | ---- | ---- | ---- | ---- |
| 21 to 25 per cent over | 7 | ---- | ---- | ---- | 2 | ---- | 1 | 3 | ---- | 1 | ---- | ---- | ---- | ---- |
| More than 25 per cent over | 6 | ---- | ---- | ---- | 1 | ---- | 2 | ---- | 2 | 1 | ---- | ---- | ---- | ---- |

## IMPROVED HEALTH CONDITIONS IN NEW YORK CITY IN THE PAST 50 YEARS.

In 1921, Dr. Royal S. Copeland, then commissioner of health of New York City, made the following significant entry in the official records of his department: "Generally speaking, where 2 persons died 50 years ago, out of every 1,000 population, only one died last year" [1920]. And he added that it was interesting to note that this tremendous decrease in the death rate was the direct result of the application of preventive measures by the sanitary officials.

This remarkable saving in human life did not stop then. A death rate of 31 per 1,000 population 50 years ago was reduced to a rate of less than 12 in 1923, a decrease of 61 per cent, or over one-half.

The following brief review is taken from the Weekly Bulletin of the Department of Health of the City of New York, for March 1, 1924, and presents some interesting and comparable figures which reveal the results of the development and application of sanitary science.

### THE EFFECT ON THE DEATH RATE OF NEW YORK CITY OF 58 YEARS OF WORK BY THE DEPARTMENT OF HEALTH.

Quite some time has elapsed since the organization, in 1866, of the board of health of the city of New York. Many changes have been made since then in the precedure as regards the prevention and cure of infectious and contagious disease, in the modes of living, in the housing of the population and its attendant health hazards, in the environment of the entire city, in the supervision and regulation of the food supply, in the care of infants and young children, in the conception of what constitutes disease, and in the hospitalization, especially of the infectious diseases. These have been so numerous and so marked that columns could be written thereon. In a statistical review condensed as this must of necessity be, only the high spots may be touched upon.

The growth of the department of health during all these years has been continuous and considerable. From a few hundred employees, the number has increased to over 3,000, with a consequent increase in the amount of money expended. In 1923, $5,478,000 was appropriated to be expended by the department of health. The most promising measure of the results of the time and money expended is the death rate from all and certain individual causes, the mortality among children, and the extension of life expectation.

*Death rate from all causes.*—This measure, or yard stick, so often used carelessly and without proper precautions for sex and age grouping of the population, may well be applied to a city or community in which there has been little change in these important factors affecting the death rate. From a death rate of 31, 50 years

ago, the gradual decrease culminated in the year 1923 with a rate of less than 12; that is to say, there has been a reduction of 61 per cent, and, if the death rate of the year 1872 had prevailed in the year just closed, 1923, there would have died in the city of New York, 185,737 persons, as compared with an actual number of deaths of 69,452, a saving during the year of 116,285 lives.

*Death rate of children under 5 years of age.*—In 1877, 105 children under 5 years of age died out of every 1,000 living at that age group, as compared with 20 deaths at this age group in the year 1923, a decrease of 81 per cent. This special death rate is often used as a measure of the sanitary progress of a community. It has been ascertained by years of practical experience that this death rate reflects, actually, the results of the health officers' efforts to prevent, if possible, and if not, to minimize the mortality among young children. The principal factors in this tremendous reduction of the mortality at this age group have been the control of the infectious diseases of childhood, especially diphtheria; the use of a pure milk supply—only attained after years of constant supervision and regulation; the well directed activities of officials charged with constant care of children; and the aid of a great number of side agencies, chiefly philanthropic, working in cooperation with health officials.

*Death rate among infants.*—The infant mortality rate is the number of children under one year of age who die out of every 1,000 born. A quarter of a century ago, 205 infants under one year of age died out of every 1,000 born, as compared with 66 deaths at this age group in the year just closed, a decrease of 68 per cent. If the death rate that prevailed in the year 1898 had been in operation in the year 1923, there would have been 26,478 deaths of infants under one year of age reported, as compared to the number that actually occurred, 8,578, a saving of 17,900 lives in this one year.

*Smallpox.*—In the year 1871, 32 people died of this malady (at that time a much dreaded disease) out of every 100,000 of the population; in 1872, the rate was 119; in 1875, the rate was 124; in 1881, it fell to 32, and, with a few mild epidemics, during which the rate was below 12, this disease has become a negligible one in this city, from 1903 until 1923 there having been such few deaths from this cause that the rates did not reach, in any year, 1 per 100,000 of the population.

*Typhoid fever.*—This cause of death has fallen from a rate of 40 per 100,000 of the population, in 1870, to a rate of 2—this low rate being in evidence during the past 5 years.

*Malarial fever.*—As a cause of death, malarial fever has been almost completely wiped out in this city. In 1872, the rate was 34 per 100,000 of the population; in 1881, it was 42. During the last 10

years, there have been so few deaths that a death rate of 1 per 100,000 is the average.

*Scarlet fever.*—This cause of death has always been with us, and has prevailed for the past 50 years with varying waves of intensity. In 4 distinct years the rate varied from 100 to 155 per 100,000 of the population, and gradually reached the low level within the past 10 years, of slightly over 4 per 100,000.

*Measles.*—In 1869, the death rate from this cause was 62 per 100,000 and, with many notable biannual waves of intensity, has, within the past 10 years, reached an average of slightly under 10 per 100,000. The rate during the 10 years immediately preceding was almost 18 per 100,000; in the decennia previous to that, the rates were considerably above this latter.

*Whooping cough.*—The mortality rate from whooping cough for 55 years shows a very considerable modification in the intensity of this cause of death.

*Diarrheal diseases under 5 years of age.*—In 1868, 36 children under 5 years of age died from this cause out of every 1,000 living at that age group; in 1872 the rate was 40; in 1876, 27; in 1880, 26; in 1884, 23; in 1888, 21, and in 1892, 22, with a gradual decrease from this rate, until 1923 when it was slightly above 2 per 1,000 children living at this age group. The strenuous efforts made by the health department to control the purity of the supply of milk of the city has had most to do with this considerable decrease. Education of the mothers has also been an important factor, and intensive work on the part of health authorities to care for the infants, especially during the summer months, has been a factor not to be overlooked.

*Diphtheria and croup.*—Exceedingly high death rates from this malady prevailed previous to the year 1894. The department of health then introduced its preparation of antitoxin with provision for supply to the poor without cost. The rate during 1923 was the lowest that the department has record of, 9 per 1,000 of the population. This stands out in strong contrast with a rate of 295, in the year 1875; 265, in the year 1881; 204, in the year 1887; and 163, in the year 1894.

*Pulmonary tuberculosis.*—The death rate from this cause varied between 408 per 100,000 of the population in the year 1872, to 375, in the year 1882; 277, in the year 1892; 207, in the year 1902; 173, in the year 1912; 86, in the year 1922; and 83, in the year 1923.

The foregoing are the causes of death which the department of health has struggled to eliminate, and which it has succeeded in at least minimizing to a hitherto unapproachable degree. These rates stand out in sharp contrast with those shown in the charts expressing the mortality from cancer and organic heart disease.

The increase in the expectation of life has been almost entirely confined to the ages before 35 years. In the future, the health officer must, of necessity, consider steps to be taken to minimize the mortality among those of middle and advanced life.

## CYANOGEN CHLORIDE GAS MIXTURE.

**Irritating Quality of New Fumigant Saves the Life of a Stowaway on Vessel Being Fumigated.**

During the years 1922–23, the United States Public Health Service and the Chemical Warfare Service of the United States Army, working together, developed a new fumigant known as cyanogen chloride gas mixture, which combines the lethal qualities of hydrocyanic acid gas with the lachrymatory properties of "tear" gas. This gas is developed more slowly than is hydrocyanic acid gas, and its effect on the eyes is such that anyone who happens to be overlooked in a compartment is likely to be driven out before he is overcome.

Acting Assistant Surgeon T. L. Richardson recently reported that this lachrymatory quality of cyanogen chloride gas mixture probably saved the life of a stowaway on the steamship *Vodice,* which was undergoing fumigation at the Baltimore quarantine station. The stowaway, according to his own statement, at first hid in the coal bunker, but when he saw this space was being prepared for fumigation, he hid in the small compartment known as the rope locker. When the fumes began to penetrate the locker, he was driven out and succeeded in making his escape through the upper companionway door before falling in a dazed condition. He was easily revived, apparently none the worse for his unpleasant experience.

## LECTURES ON TUBERCULOSIS AND INDUSTRIAL HYGIENE.

A six weeks' combined course on tuberculosis and industrial hygiene for medical practitioners has been arranged at the Academy of Medicine, New York City, under the joint auspices of the public health committee of the academy, the New York Tuberculosis Association, and the division of industrial hygiene of the New York State Department of Labor.

The purpose of the course is to focus the attention of the physicians of New York City on such problems of tuberculosis and industrial hygiene as would be of practical assistance to them in their professional work.

The lectures will be held at the Academy of Medicine on Tuesday and Friday afternoons at 4.30, beginning March 14 and ending April 22, 1924. Two lectures of 30 minutes each, one on tuberculosis and the other on some phase of industrial hygiene, will be given at each session. An additional half hour will be devoted to answering questions from the floor.

Information regarding these lectures may be obtained by addressing Dr. E. H. Lewinski-Corwin, executive secretary, public health committee, New York Academy of Medicine, 17 West Forty-third Street, New York City.

## DEATHS DURING THE WEEK ENDED MARCH 1, 1924.

*Summary of information received by telegraph from industrial insurance companies for week ended March 1, 1924, and corresponding week of 1923. (From the weekly Health Index, March 6, 1924, issued by the Bureau of the Census, Department of Commerce.)*

| | Week ended March 1, 1924. | Corresponding week, 1923. |
|---|---|---|
| Policies in force | 56, 735, 920 | 52, 294. 517 |
| Number of death claims | 12, 735 | 15, 112 |
| Death claims per 1,000 policies in force, annual rate | 11. 7 | 15. 1 |

*Deaths from all causes in certain large cities of the United States during the week ended March 1, 1924, infant mortality, annual death rate, and comparison with corresponding week of 1923. (From the Weekly Health Index, March 6, 1924, issued by the Bureau of the Census, Department of Commerce.)*

| City. | Week ended Mar. 1, 1924. | | Annual death rate per 1,000, corresponding week, 1923. | Deaths under 1 year. | | Infant mortality rate, week ended Mar. 1, 1924.[2] |
|---|---|---|---|---|---|---|
| | Total deaths. | Death rate.[1] | | Week ended Mar. 1 1924. | Corresponding week, 1923. | |
| Total (66 cities) | 7,559 | 14.5 | 19.1 | 970 | 1,213 | ..... |
| Akron | 21 | ..... | ..... | 3 | 10 | 32 |
| Albany [3] | 47 | 20.7 | 19 1 | 4 | 5 | 88 |
| Atlanta | 96 | 22.0 | 16.6 | 14 | 10 | ..... |
| Baltimore [3] | 279 | 18.5 | 23.3 | 34 | 51 | 99 |
| Birmingham | 73 | 19.0 | 13.8 | 16 | 6 | ..... |
| Boston | 217 | 14.6 | 22.1 | 32 | 55 | 89 |
| Bridgeport | 49 | ..... | ..... | 8 | 7 | 125 |
| Buffalo | 132 | 12.6 | 17.0 | 28 | 37 | 119 |
| Cambridge | 29 | 13.5 | 21.1 | 5 | 10 | 87 |
| Camden | 36 | 14.9 | 16.0 | 9 | 6 | 142 |
| Canton | 30 | 15.2 | 17.3 | 8 | 4 | 169 |
| Chicago [3] | 712 | 12.6 | 16.9 | 96 | 129 | 89 |
| Cincinnati | 128 | 16 4 | 19.6 | 12 | 16 | 76 |
| Cleveland | 211 | 12 1 | 16.2 | 37 | 39 | 97 |
| Columbus | 58 | 11.3 | 22.2 | 5 | 12 | 48 |
| Dallas | 78 | 21.6 | 11.4 | 11 | 3 | ..... |
| Dayton | 47 | 14.5 | 20.2 | 3 | 5 | 50 |
| Denver | 90 | ..... | ..... | 8 | 8 | ..... |
| Des Moines | 28 | 10.1 | 23.7 | 3 | 4 | ..... |
| Detroit | 273 | ..... | ..... | 46 | 42 | 86 |
| Duluth | 20 | 9.6 | 12.8 | 1 | 3 | 21 |
| Erie | 39 | ..... | ..... | 10 | 5 | 206 |
| Fall River [3] | 37 | 15.9 | 15.5 | 8 | 8 | 113 |

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births—an annual rate based on deaths under 1 year for the week and estimated births of 1923. Cities left blank are not in the registration area for births.
[3] Deaths for week ended Friday, Feb. 29, 1924.

*Deaths from all causes in certain large cities of the United States during the week ended March 1, 1924, infant mortality, annual death rate, and comparison with corresponding week of 1923. (From the Weekly Health Index, March 6, 1924, issued by the Bureau of the Census, Department of Commerce.)*—Continued.

| City. | Week ended Mar. 1, 1924. | | Annual death rate per 1,000, corresponding week, 1923. | Deaths under 1 year. | | Infant mortality rate week ended Mar. 1, 1924. |
|---|---|---|---|---|---|---|
| | Total deaths. | Death rate. | | Week ended Mar. 1 1924. | Corresponding week, 1923. | |
| Flint | 28 | ..... | ..... | 2 | 11 | 35 |
| Fort Worth | 40 | 14.1 | 10.9 | 5 | 5 | ..... |
| Grand Rapids | 29 | 10.2 | 23.6 | 2 | 4 | 31 |
| Houston | 31 | ..... | ..... | 5 | 6 | ..... |
| Indianapolis | 91 | 13.5 | 20.4 | 10 | 14 | 76 |
| Jacksonville, Fla | 36 | 18.3 | 21.9 | 6 | 4 | ..... |
| Jersey City | 89 | 14.9 | 21.8 | 11 | 18 | 80 |
| Kansas City, Kans | 35 | 15.5 | 29.7 | 3 | 6 | 60 |
| Kansas City, Mo | 103 | 14.9 | 23.0 | 19 | 16 | ..... |
| Los Angeles | 223 | ..... | ..... | 14 | 16 | 44 |
| Louisville | 83 | 16.7 | 22.1 | 8 | 18 | 77 |
| Lowell | 24 | 10.8 | 21.3 | 6 | 5 | 107 |
| Lynn | 32 | 16.1 | 21.8 | 3 | 4 | 76 |
| Memphis | 82 | 24.8 | 21.8 | 9 | 11 | ..... |
| Milwaukee | 88 | 9.3 | 16.9 | 13 | 21 | 59 |
| Minneapolis | 92 | 11.5 | 15.5 | 9 | 13 | 48 |
| Nashville [3] | 52 | 22.0 | 16.2 | 6 | 5 | ..... |
| New Bedford | 32 | 12.6 | 20.4 | 7 | 10 | 109 |
| New Haven | 46 | 13.6 | 18.7 | 6 | 7 | 78 |
| New Orleans | 164 | 20.9 | 26.7 | 15 | 11 | ..... |
| New York | 1,580 | 13.7 | 19.2 | 218 | 228 | 88 |
| Bronx Borough | 184 | 11.0 | 16.9 | 16 | 21 | 56 |
| Brooklyn Borough | 563 | 13.4 | 17.5 | 75 | 72 | 81 |
| Manhattan Borough | 701 | 16.2 | 22.1 | 114 | 113 | 111 |
| Queens Borough | 89 | 8.4 | 16.3 | 9 | 18 | 49 |
| Richmond Borough | 43 | 17.2 | 25.8 | 4 | 4 | 73 |
| Newark, N. J | 109 | 12.8 | 21.0 | 14 | 21 | 66 |
| Norfolk | 44 | 14.0 | 12.8 | 7 | 4 | 127 |
| Oakland | 86 | 18.2 | 11.3 | 9 | 5 | 113 |
| Oklahoma City | 29 | 14.5 | ..... | 4 | ..... | ..... |
| Omaha | 58 | 14.5 | 24.2 | 5 | 11 | 54 |
| Paterson | 40 | 14.8 | 14.6 | 6 | 6 | 98 |
| Philadelphia | 583 | 15.6 | 20.4 | 62 | 113 | 79 |
| Pittsburgh | 196 | 16.3 | 27.6 | 30 | 41 | 102 |
| Portland, Oreg | 52 | 9.8 | 14.7 | 2 | 4 | 21 |
| Providence | 94 | 20.1 | 20.2 | 12 | 7 | 98 |
| Richmond | 66 | 18.7 | 21.0 | 10 | 13 | 118 |
| Rochester | 70 | 11.2 | 17.0 | 12 | 10 | 94 |
| St. Louis | 239 | 15.3 | 18.4 | 20 | 18 | ..... |
| St. Paul | 59 | 12.6 | 19.4 | 5 | 9 | 43 |
| Salt Lake City [3] | 38 | 15.4 | 12.8 | 4 | 5 | 66 |
| San Antonio | 78 | 21.2 | 19.5 | 7 | 20 | ..... |
| San Francisco | 165 | 15.7 | 17.5 | 10 | 12 | 60 |
| Schenectady | 16 | 8.3 | 14.8 | 1 | 6 | 28 |
| Seattle | 68 | ..... | ..... | 4 | 4 | 39 |
| Somerville | 23 | 11.9 | 14.8 | 4 | 1 | 109 |
| Spokane | 28 | ..... | ..... | 5 | 5 | 106 |
| Springfield, Mass | 34 | 11.9 | 19.5 | 7 | 6 | 118 |
| Syracuse | 40 | 11.1 | 15.0 | 5 | 10 | 62 |
| Tacoma | 21 | 10.6 | 11.3 | 0 | 5 | 0 |
| Toledo | 74 | 14.0 | 19.4 | 8 | 13 | 76 |
| Trenton | 50 | 20.1 | 25.4 | 8 | 8 | 131 |
| Utica | 35 | 17.3 | 21.2 | 4 | 5 | 87 |
| Washington, D. C | 156 | 16.7 | 18.4 | 13 | 24 | 75 |
| Waterbury | 29 | ..... | ..... | 2 | 5 | 45 |
| Wilmington, Del | 32 | 13.9 | 19.0 | 2 | 11 | 43 |
| Worcester | 52 | 13.9 | 18.5 | 8 | 11 | 96 |
| Yonkers | 16 | 7.6 | 18.9 | 3 | 1 | 66 |
| Youngstown | 48 | 16.1 | 26.0 | 6 | 10 | 87 |

[3] Deaths for week ended Friday Feb. 29, 1924.

# 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 STATE SUMMARIES.

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

### Reports for Week Ended March 8, 1924.

ALABAMA.

| | Cases. |
|---|---|
| Chicken pox | 91 |
| Diphtheria | 10 |
| Influenza | 151 |
| Malaria | 14 |
| Measles | 710 |
| Mumps | 51 |
| Pneumonia | 140 |
| Scarlet fever | 3 |
| Smallpox | 60 |
| Tuberculosis | 17 |
| Typhoid fever | 7 |
| Whooping cough | 119 |

ARIZONA.

| | |
|---|---|
| Chicken pox | 4 |
| Diphtheria | 4 |
| Influenza | 18 |
| Measles | 54 |
| Mumps | 8 |
| Scarlet fever | 3 |
| Smallpox | 1 |
| Trachoma | 4 |
| Tuberculosis | 16 |

ARKANSAS.

| | |
|---|---|
| Chicken pox | 28 |
| Dengue | 2 |
| Diphtheria | 7 |
| Influenza | 146 |
| Malaria | 27 |
| Measles | 391 |
| Mumps | 38 |
| Pellagra | 1 |
| Scarlet fever | 5 |
| Smallpox | 11 |
| Trachoma | 1 |
| Tuberculosis | 13 |
| Typhoid fever | 2 |
| Whooping cough | 36 |

CALIFORNIA.

| Cerebrospinal meningitis: | Cases. |
|---|---|
| Kern County | 1 |
| San Francisco | 2 |
| Diphtheria | 251 |
| Influenza | 44 |
| Lethargic encephalitis: | |
| Los Angeles | 1 |
| San Francisco | 1 |
| Measles | 1,395 |
| Poliomyelitis: | |
| Los Angeles | 1 |
| Redlands | 1 |
| Scarlet fever | 297 |
| Smallpox: | |
| Compton | 12 |
| Long Beach | 28 |
| Los Angeles | 81 |
| Los Angeles County | 42 |
| San Bernardino | 13 |
| Santa Ana | 10 |
| Scattering | 61 |
| Typhoid fever: | |
| Santa Ana | 66 |
| Scattering | 12 |

COLORADO.
(Exclusive of Denver.)

| | |
|---|---|
| Chicken pox | 6 |
| Diphtheria | 13 |
| Measles | 114 |
| Mumps | 40 |
| Pneumonia | 4 |
| Scarlet fever | 11 |
| Tuberculosis | 48 |
| Whooping cough | 6 |

CONNECTICUT.

| | |
|---|---|
| Cerebrospinal meningitis | 1 |
| Chicken pox | 54 |
| Diphtheria | 40 |

| CONNECTICUT—continued. | Cases. |
|---|---|
| German measles | 9 |
| Influenza | 10 |
| Lethargic encephalitis | 2 |
| Measles | 95 |
| Mumps | 215 |
| Pneumonia (lobar) | 56 |
| Scarlet fever | 193 |
| Septic sore throat | 1 |
| Smallpox | 11 |
| Tuberculosis (all forms) | 36 |
| Typhoid fever | 1 |
| Whooping cough | 28 |
| **DELAWARE.** | |
| Chicken pox | 3 |
| Diphtheria | 6 |
| Influenza | 1 |
| Measles | 2 |
| Mumps | 4 |
| Pneumonia | 5 |
| Scarlet fever: | |
| Wilmington | 13 |
| Scattering | 4 |
| Tuberculosis | 6 |
| Whooping cough | 4 |
| **DISTRICT OF COLUMBIA.** | |
| Chicken pox | 73 |
| Diphtheria | 8 |
| Influenza | 4 |
| Lethargic encephalitis | 1 |
| Measles | 5 |
| Scarlet fever | 48 |
| Smallpox | 3 |
| Tuberculosis | 25 |
| Whooping cough | 15 |
| **FLORIDA.** | |
| Cerebrospinal meningitis | 1 |
| Diphtheria | 14 |
| Influenza | 13 |
| Leprosy | 1 |
| Malaria | 11 |
| Pneumonia | 6 |
| Scarlet fever | 17 |
| Smallpox | 3 |
| Typhoid fever | 6 |
| **GEORGIA** | |
| Chicken pox | 45 |
| Conjunctivitis (infectious) | 1 |
| Dengue | 2 |
| Diphtheria | 8 |
| Dysentery (amebic) | 1 |
| German measles | 5 |
| Hookworm disease | 3 |
| Influenza | 43 |
| Malaria | 7 |
| Measles | 357 |
| Mumps | 38 |
| Pneumonia | 71 |
| Scarlet fever | 19 |
| Septic sore throat | 5 |
| Smallpox | 206 |
| Tetanus | 1 |
| Trachoma | 1 |
| Tuberculosis (pulmonary) | 12 |
| Typhoid fever | 5 |
| Whooping cough | 8 |

| ILLINOIS. | |
|---|---|
| Diphtheria: | Cases. |
| Cook County | 74 |
| Iroquois County | 9 |
| Scattering | 59 |
| Influenza | 73 |
| Measles | 448 |
| Pneumonia | 504 |
| Poliomyelitis—Hancock County | 1 |
| Scarlet fever: | |
| Cook County | 142 |
| DeKalb County | 15 |
| Kane County | 24 |
| Kendall County | 8 |
| La Salle County | 39 |
| Macon County | 14 |
| Stark County | 9 |
| Will County | 9 |
| Scattering | 110 |
| Smallpox: | |
| Chicago | 17 |
| Scattering | 5 |
| Tuberculosis | 246 |
| Typhoid fever | 14 |
| Whooping cough | 144 |
| **INDIANA.** | |
| Cerebrospinal meningitis: | |
| Elkhart County | 1 |
| Washington | 1 |
| Chicken pox | 98 |
| Diphtheria: | |
| St. Joseph County | 10 |
| Scattering | 69 |
| Influenza | 18 |
| Measles | 525 |
| Pneumonia | 26 |
| Poliomyelitis—Clinton County | 1 |
| Scarlet fever: | |
| Elkhart County | 10 |
| Lake County | 27 |
| Marshall County | 9 |
| St. Joseph County | 27 |
| Scattering | 73 |
| Smallpox: | |
| Delaware County | 9 |
| Grant County | 11 |
| Harrison County | 11 |
| Marion County | 28 |
| Scattering | 34 |
| Tuberculosis | 26 |
| Typhoid fever | 5 |
| Whooping cough | 138 |
| **IOWA.** | |
| Diptheria | 14 |
| Scarlet fever | 75 |
| Smallpox | 19 |
| **KANSAS.** | |
| Chicken pox | 110 |
| Diphtheria | 37 |
| German measles | 8 |
| Influenza | 4 |
| Measles | 1,587 |
| Mumps | 360 |
| Pneumonia | 60 |
| Poliomyelitis | 1 |

| KANSAS—continued. | Cases. |
|---|---|
| Scarlet fever | 77 |
| Smallpox | 56 |
| Trachoma | 1 |
| Tuberculosis | 25 |
| Typhoid fever | 1 |
| Whooping cough | 104 |

| LOUISIANA. | |
|---|---|
| Diphtheria | 18 |
| Hookworm disease | 11 |
| Influenza | 70 |
| Malaria | 7 |
| Measles | 271 |
| Pneumonia | 56 |
| Scarlet fever | 11 |
| Smallpox | 48 |
| Tuberculosis | 29 |
| Typhoid fever | 7 |
| Whooping cough | 20 |

| MAINE. | |
|---|---|
| Chicken pox | 53 |
| Diphtheria | 19 |
| German measles | 13 |
| Influenza | 6 |
| Measles | 90 |
| Mumps | 20 |
| Pneumonia | 21 |
| Scarlet fever | 42 |
| Septic sore throat | 1 |
| Tuberculosis | 21 |
| Whooping cough | 32 |

| MARYLAND.[1] | |
|---|---|
| Chicken pox | 255 |
| Diphtheria | 29 |
| German measles | 39 |
| Influenza | 96 |
| Lethargic encephalitis | 1 |
| Measles | 269 |
| Mumps | 40 |
| Pneumonia (all forms) | 156 |
| Scarlet fever | 158 |
| Septic sore throat | 10 |
| Tuberculosis | 57 |
| Typhoid fever | 2 |
| Whooping cough | 49 |

| MASSACHUSETTS. | |
|---|---|
| Cerebrospinal meningitis | 3 |
| Chicken pox | 295 |
| Conjunctivitis (suppurative) | 29 |
| Diphtheria | 130 |
| German measles | 30 |
| Influenza | 13 |
| Lethargic encephalitis | 1 |
| Malaria | 1 |
| Measles | 932 |
| Mumps | 423 |
| Ophthalmia neonatorum | 18 |
| Pneumonia (lobar) | 137 |
| Scarlet fever | 502 |
| Septic sore throat | 14 |
| Smallpox | 1 |
| Tetanus | 1 |
| Trichinosis | 1 |

[1] Week ended Friday.

| MASSACHUSETTS—continued. | Cases. |
|---|---|
| Tuberculosis (all forms) | 154 |
| Typhoid fever | 9 |
| Whooping cough | 113 |

| MICHIGAN. | |
|---|---|
| Diphtheria | 116 |
| Measles | 543 |
| Pneumonia | 103 |
| Scarlet fever | 354 |
| Smallpox | 175 |
| Tuberculosis | 35 |
| Typhoid fever | 7 |
| Whooping cough | 43 |

| MINNESOTA. | |
|---|---|
| Cerebrospinal meningitis | 1 |
| Chicken pox | 39 |
| Diphtheria | 82 |
| Influenza | 1 |
| Measles | 189 |
| Pneumonia | 8 |
| Scarlet fever | 290 |
| Smallpox | 70 |
| Tuberculosis | 92 |
| Typhoid fever | 2 |
| Whooping cough | 13 |

| MISSISSIPPI. | |
|---|---|
| Diphtheria | 14 |
| Scarlet fever | 7 |
| Smallpox | 10 |
| Typhoid fever | 11 |

MISSOURI.

(Exclusive of Kansas City and Moberly.)

| | |
|---|---|
| Chicken pox | 64 |
| Diphtheria | 59 |
| Influenza | 8 |
| Measles | 418 |
| Mumps | 60 |
| Pneumonia | 12 |
| Scarlet fever | 128 |
| Smallpox | 24 |
| Tetanus | 1 |
| Trachoma | 1 |
| Tuberculosis | 46 |
| Typhoid fever | 5 |
| Whooping cough | 65 |

| MONTANA. | |
|---|---|
| Diphtheria | 10 |
| Scarlet fever | 20 |
| Smallpox | 25 |
| Typhoid fever | 2 |

| NEBRASKA. | |
|---|---|
| Chicken pox | 15 |
| Diphtheria | 27 |
| Influenza | 1 |
| Measles | 454 |
| Mumps | 7 |
| Scarlet fever | 32 |
| Septic sore throat | 1 |
| Smallpox | 13 |
| Whooping cough | 2 |

| NEW JERSEY. | Cases. |
|---|---|
| Cerebrospinal meningitis | 3 |
| Chicken pox | 268 |
| Diphtheria | 109 |
| Influenza | 32 |
| Measles | 641 |
| Paratyphoid fever | 1 |
| Pneumonia | 204 |
| Poliomyelitis | 1 |
| Scarlet fever | 226 |
| Smallpox | 3 |
| Trachoma | 1 |
| Typhoid fever | 7 |
| Whooping cough | 104 |

| NEW MEXICO. | |
|---|---|
| Cerebrospinal meningitis | 1 |
| Chicken pox | 11 |
| Conjunctivitis | 3 |
| Diphtheria | 11 |
| Influenza | 7 |
| Measles | 368 |
| Mumps | 14 |
| Pneumonia | 14 |
| Scarlet fever | 13 |
| Smallpox | 2 |
| Tuberculosis | 10 |
| Whooping cough | 4 |

| NEW YORK. (Exclusive of New York City.) | |
|---|---|
| Cerebrospinal meningitis | 4 |
| Diphtheria | 135 |
| Influenza | 54 |
| Lethargic encephalitis | 1 |
| Measles | 1,691 |
| Pneumonia | 329 |
| Scarlet fever | 470 |
| Smallpox | 4 |
| Typhoid fever | 16 |
| Whooping cough | 329 |

| NORTH CAROLINA. | |
|---|---|
| Cerebrospinal meningitis | 1 |
| Chicken pox | 238 |
| Diphtheria | 36 |
| German measles | 3 |
| Measles | 2,046 |
| Scarlet fever | 46 |
| Septic sore throat | 1 |
| Smallpox | 150 |
| Typhoid fever | 4 |
| Whooping cough | 380 |

| OREGON. | |
|---|---|
| Chicken pox | 16 |
| Diphtheria: | |
| Portland | 17 |
| Scattering | 9 |
| Measles | 269 |
| Mumps | 8 |
| Pneumonia | [2] 17 |
| Scarlet fever | 16 |
| Smallpox: | |
| Portland | 23 |
| Scattering | 6 |
| Tuberculosis | 8 |
| Typhoid fever | 2 |
| Whooping cough | 13 |

[2] Deaths.

| SOUTH DAKOTA. | Cases. |
|---|---|
| Chicken pox | 20 |
| Diphtheria | 8 |
| Influenza | 2 |
| Measles | 316 |
| Pneumonia | 6 |
| Scarlet fever | 53 |
| Smallpox | 13 |
| Tuberculosis | 15 |
| Typhoid fever | 2 |

| TEXAS. | |
|---|---|
| Chicken pox | 60 |
| Diphtheria | 43 |
| Influenza | 101 |
| Measles | 1,219 |
| Mumps | 7 |
| Pneumonia | 67 |
| Scarlet fever | 24 |
| Smallpox | 35 |
| Trachoma | 3 |
| Tuberculosis | 59 |
| Typhoid fever | 3 |
| Whooping cough | 58 |

| VERMONT. | |
|---|---|
| Chicken pox | 26 |
| Diphtheria | 4 |
| Measles | 237 |
| Mumps | 20 |
| Scarlet fever | 5 |
| Smallpox | 1 |
| Typhoid fever | 1 |
| Whooping cough | 13 |

| WASHINGTON. | |
|---|---|
| Cerebrospinal meningitis | 1 |
| Chicken pox | 69 |
| Diphtheria: | |
| King County | 16 |
| Scattering | 20 |
| Lethargic encephalitis—Yakima County | 1 |
| Measles | 796 |
| Mumps | 71 |
| Pneumonia | 2 |
| Scarlet fever: | |
| Seattle | 10 |
| Spokane | 15 |
| Scattering | 29 |
| Smallpox: | |
| Cowlitz County | 10 |
| Hoquiam County | 20 |
| Spokane | 20 |
| Scattering | 24 |
| Tuberculosis | 32 |
| Typhoid fever | 3 |
| Whooping cough | 30 |

| WEST VIRGINIA. | |
|---|---|
| Diphtheria | 11 |
| Scarlet fever | 7 |
| Smallpox | 10 |
| Typhoid fever | 4 |

WISCONSIN.

| Milwaukee: | Cases. |
|---|---|
| Chicken pox | 58 |
| Diphtheria | 14 |
| Lethargic encephalitis | 1 |
| Measles | 36 |
| Pneumonia | 5 |
| Poliomyelitis | 1 |
| Scarlet fever | 32 |
| Tuberculosis | 12 |
| Whooping cough | 42 |
| Scattering: | |
| Chicken pox | 179 |
| Diphtheria | 54 |
| German measles | 1 |
| Influenza | 29 |
| Measles | 415 |
| Pneumonia | 42 |
| Scarlet fever | 322 |
| Smallpox | 34 |
| Trachoma | 1 |
| Tuberculosis | 17 |
| Typhoid fever | 1 |
| Whooping cough | 143 |

WISCONSIN—continued.

WYOMING.

| | Cases. |
|---|---|
| Chicken pox | 24 |
| Diphtheria | 2 |
| Impetigo contagiosa | 1 |
| Measles | 174 |
| Pneumonia | 3 |
| Scarlet fever | 5 |
| Whooping cough | 2 |

## Report for Week Ending March 1, 1924.

NORTH DAKOTA.

| | Cases. |
|---|---|
| Cerebrospinal meningitis | 1 |
| Chicken pox | 13 |
| Diphtheria | 7 |
| German measles | 3 |
| Measles | 233 |
| Mumps | 1 |
| Pneumonia | 25 |
| Poliomyelitis | 1 |
| Scarlet fever | 54 |
| Smallpox | 21 |
| Trachoma | 5 |
| Tuberculosis | 6 |
| Typhoid fever | 3 |
| Whooping cough | 18 |

## SUMMARY OF CASES REPORTED MONTHLY BY STATES.

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

| State. | Cerebrospinal meningitis. | Diphtheria. | Influenza. | Malaria. | Measles. | Pellagra. | Poliomyelitis. | Scarlet fever. | Smallpox. | Typhoid fever. |
|---|---|---|---|---|---|---|---|---|---|---|
| *January, 1924.* | | | | | | | | | | |
| Hawaii | 23 | 11 | 91 | ..... | 15 | ..... | ..... | 3 | ..... | 11 |
| New York | 22 | 1,815 | 436 | 4 | 7,739 | ..... | 11 | 2,755 | 24 | 206 |
| West Virginia | 2 | 141 | 173 | ..... | 77 | ..... | ..... | 183 | 32 | 55 |
| *February, 1924.* | | | | | | | | | | |
| Connecticut | 2 | 229 | 43 | 1 | 829 | ..... | 2 | 746 | 7 | 6 |

## Number of Cases of Certain Communicable Diseases Reported for the Month of December, 1923, by State Health Officers.

| State. | Chicken pox. | Diphtheria. | Measles. | Mumps. | Scarlet fever. | Smallpox. | Tuberculosis. | Typhoid fever. | Whooping cough. |
|---|---|---|---|---|---|---|---|---|---|
| Alabama | 164 | 114 | 1,392 | 33 | 72 | 49 | 114 | 55 | ..... |
| Arizona | 30 | 26 | 72 | 7 | 56 | 2 | 122 | 7 | ..... |
| Arkansas | 61 | 71 | 360 | 16 | 23 | 44 | 47 | 41 | 121 |
| California | 648 | 1,316 | 1,497 | 95 | 1,086 | 543 | 626 | 66 | 94 |
| Colorado | 250 | 219 | 686 | 75 | 219 | 1 | 279 | 22 | 40 |
| Connecticut | 570 | 306 | 883 | 228 | 475 | 1 | 120 | 28 | 116 |
| Delaware | 32 | 29 | 7 | ..... | 79 | ..... | 26 | 10 | 16 |
| Dist. of Col | 243 | 62 | 31 | ..... | 115 | 14 | 94 | 4 | 59 |
| Florida | 24 | 145 | 662 | 12 | 13 | 20 | 283 | 75 | 36 |
| Georgia [1] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Hawaii | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Idaho | 111 | 38 | 1,031 | ..... | 255 | 17 | ..... | 2 | 2 |

[1] Reports received weekly.

## SUMMARY OF CASES REPORTED MONTHLY BY STATES—Continued.

### Number of Cases of Certain Communicable Diseases Reported for the Month of December, 1923, by State Health Officers—Continued.

| State. | Chicken pox. | Diphtheria. | Measles. | Mumps. | Scarlet fever. | Smallpox. | Tuberculosis. | Typhoid fever. | Whooping cough. |
|---|---|---|---|---|---|---|---|---|---|
| Illinois | 1,984 | 1,118 | 1,953 | 800 | 1,123 | 21 | 886 | 277 | 501 |
| Indiana | 355 | 794 | 1,555 | ..... | 532 | 278 | ..... | 157 | 578 |
| Iowa | 186 | 173 | 283 | 99 | 338 | 30 | ..... | (2) | 56 |
| Kansas | 583 | 371 | 614 | 344 | 364 | 49 | 86 | 10 | 299 |
| Kentucky [1] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Louisiana | 23 | 143 | 633 | 6 | 53 | 62 | 138 | 21 | 24 |
| Maine | 269 | 81 | 204 | 120 | 138 | 2 | 33 | 15 | 201 |
| Maryland | 510 | 227 | 269 | 32 | 357 | 5 | 213 | 75 | 181 |
| Massachusetts | 1,583 | 1,102 | 1,320 | 797 | 1,550 | 4 | 493 | 32 | 411 |
| Michigan | 1,362 | 945 | 1,901 | 310 | 1,373 | 422 | 344 | 52 | 331 |
| Minnesota | 844 | 524 | 758 | ..... | 1,243 | 221 | 308 | 36 | 39 |
| Mississippi | 706 | 138 | 1,880 | 69 | 37 | 82 | 219 | 46 | 758 |
| Missouri [1] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Montana | 130 | 39 | 956 | 3 | 137 | 181 | 16 | 8 | 26 |
| Nebraska | 114 | 133 | 873 | 21 | 201 | 4 | ..... | 1 | 12 |
| Nevada [3] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| New Hampshire [3] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| New Jersey | 1,151 | 684 | 751 | ..... | 496 | 3 | 414 | 41 | 377 |
| New Mexico | 37 | 31 | 55 | 33 | 43 | ..... | 66 | 25 | 9 |
| New York | 3,563 | 1,761 | 4,760 | 1,075 | 2,205 | 56 | 1,218 | 92 | 1,700 |
| North Carolina | 758 | 379 | 4,979 | ..... | 295 | 413 | ..... | 42 | 1,422 |
| North Dakota | 101 | 132 | 903 | ..... | 298 | 50 | 37 | 16 | 39 |
| Ohio | 2,261 | 1,257 | 532 | 402 | 1,715 | 291 | 646 | 60 | 483 |
| Oklahoma | ..... | 59 | 95 | ..... | 76 | 45 | 27 | 21 | ..... |
| Oregon | 121 | 331 | 3,123 | 11 | 102 | 66 | 44 | 11 | 8 |
| Pennsylvania | 4,189 | 2,016 | 2,600 | 988 | 1,950 | 19 | 520 | 152 | 1,074 |
| Porto Rico | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Rhode Island | 54 | 104 | 28 | 4 | 246 | ..... | 35 | 3 | 13 |
| South Carolina | 50 | 164 | 690 | 66 | 16 | 84 | 3 | 7 | 97 |
| South Dakota | 165 | 46 | 893 | 94 | 256 | 13 | 25 | 4 | ..... |
| Tennessee [3] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Texas [1] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Utah [3] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Vermont | 187 | 21 | 503 | 34 | 67 | 47 | ..... | 2 | 344 |
| Virginia | 800 | 519 | 1,430 | ..... | 370 | 25 | ..... | 70 | 1,297 |
| Washington | 328 | 164 | 5,036 | 98 | 292 | 249 | 147 | 27 | 38 |
| West Virginia | 452 | 222 | 88 | ..... | 271 | 12 | 55 | 44 | 183 |
| Wisconsin | 1,375 | 588 | 1,358 | 36 | 1,196 | 110 | 156 | 19 | 770 |
| Wyoming | 109 | 11 | 453 | 2 | 33 | ..... | ..... | 1 | 99 |

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

### Case Rates per 1,000 Population (Annual Basis) for the Month of December, 1923.

| State. | Chicken pox. | Diphtheria. | Measles | Mumps. | Scarlet fever. | Smallpox. | Tuberculosis. | Typhoid fever. | Whooping cough. |
|---|---|---|---|---|---|---|---|---|---|
| Alabama | 0.80 | 0.55 | 6.76 | 0.16 | 0.35 | 0.24 | 0.55 | 0.27 | ..... |
| Arizona | .93 | .80 | 2.23 | .22 | 1.73 | .06 | 3.77 | .22 | ..... |
| Arkansas | .40 | .46 | 2.33 | .10 | .15 | .29 | .30 | .27 | 0.78 |
| California | 2.01 | 4.07 | 4.63 | .29 | 3.36 | 1.68 | 1.94 | .20 | .29 |
| Colorado | 2.97 | 2.60 | 8.16 | .89 | 2.60 | .01 | 3.32 | .26 | .48 |
| Connecticut | 4.55 | 2.44 | 7.04 | 1.82 | 3.79 | .01 | .96 | .22 | .93 |
| Delaware | 1.63 | 1.48 | .36 | ..... | 4.04 | ..... | 1.33 | .51 | .82 |
| District of Columbia | 6.54 | 1.67 | .83 | ..... | 3.09 | .38 | 2.53 | .11 | 1.59 |
| Florida | .27 | 1.63 | 7.45 | .14 | .15 | .23 | 3.18 | .84 | .41 |
| Georgia [1] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Hawaii | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Idaho | 2.78 | .95 | 25.82 | ..... | 6.39 | .43 | ..... | .05 | .05 |
| Illinois | 3.44 | 1.94 | 3.39 | 1.39 | 1.95 | .04 | 1.54 | .48 | .87 |
| Indiana | 1.39 | 3.10 | 6.08 | ..... | 2.08 | 1.09 | ..... | .61 | 2.26 |
| Iowa | .89 | .83 | 1.35 | .47 | 1.61 | .14 | ..... | (2) | .27 |
| Kansas | 3.82 | 2.43 | 4.02 | 2.25 | 2.38 | .32 | .56 | .07 | 1.96 |
| Kentucky [1] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Louisiana | .15 | .91 | 4.03 | .04 | .34 | .39 | .88 | .13 | .15 |
| Maine | 4.07 | 1.23 | 3.09 | 1.82 | 2.09 | .03 | .50 | .23 | 3.04 |
| Maryland | 3.99 | 1.78 | 2.10 | .25 | 2.79 | .04 | 1.67 | .59 | 1.42 |
| Massachusetts | 4.63 | 3.22 | 3.86 | 2.33 | 4.53 | .01 | 1.44 | .09 | 1.20 |

[1] Reports received weekly. [2] Reports not required by law.

SUMMARY OF CASES REPORTED MONTHLY BY STATES—Continued.

**Case Rates per 1,000 Population (Annual Basis) for the Month of December, 1923—Continued.**

| State. | Chicken pox. | Diphtheria. | Measles. | Mumps. | Scarlet fever. | Smallpox. | Tuberculosis. | Typhoid fever. | Whooping cough. |
|---|---|---|---|---|---|---|---|---|---|
| Michigan | 4.03 | 2.80 | 5.63 | 0.92 | 4.06 | 1.25 | 1.02 | 0.15 | 0.98 |
| Minnesota | 3.98 | 2.47 | 3.57 | ..... | 5.86 | 1.04 | 1.45 | .17 | .18 |
| Mississippi | 4.64 | .91 | 12.36 | .45 | .24 | .54 | 1.44 | .30 | 4.98 |
| Missouri [1] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Montana | 2.50 | .75 | 18.42 | .06 | 2.64 | 3.49 | .31 | .15 | .50 |
| Nebraska | 1.01 | 1.17 | 7.71 | .19 | 1.77 | .04 | ..... | .01 | .11 |
| Nevada [2] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| New Hampshire [2] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| New Jersey | 4.01 | 2.38 | 2.62 | ..... | 1.73 | .01 | 1.44 | .14 | 1.31 |
| New Mexico | 1.17 | .98 | 1.74 | 1.04 | 1.36 | ..... | 2.09 | .79 | .28 |
| New York | 3.87 | 1.91 | 5.17 | 1.17 | 2.39 | .06 | 1.32 | .10 | 1.35 |
| North Carolina | 3.32 | 1.66 | 21.82 | ..... | 1.29 | 1.81 | ..... | .18 | 6.23 |
| North Dakota | 1.77 | 2.31 | 15.82 | ..... | 5.22 | .88 | .65 | .28 | .68 |
| Ohio | 4.35 | 2.42 | 1.02 | .77 | 3.30 | .56 | 1.24 | .12 | .93 |
| Oklahoma | ..... | .32 | .52 | ..... | .41 | .25 | .15 | .11 | ..... |
| Oregon | 1.73 | 4.73 | 44.66 | .16 | 1.46 | .94 | .63 | .16 | .11 |
| Pennsylvania | 5.42 | 2.61 | 3.36 | 1.28 | 2.52 | .02 | .67 | .20 | 1.39 |
| Porto Rico | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Rhode Island | 1.01 | 1.95 | .53 | .08 | 4.62 | ..... | .66 | .06 | .24 |
| South Carolina | .34 | 1.11 | 4.66 | .45 | .11 | .57 | .02 | .05 | .65 |
| South Dakota | 2.96 | .83 | 16.04 | 1.69 | 4.60 | .23 | .45 | .07 | ..... |
| Tennessee [2] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Texas [1] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Utah [2] | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Vermont | 6.25 | .70 | 16.80 | 1.14 | 2.24 | 1.57 | ..... | .97 | 11.49 |
| Virginia | 3.93 | 2.55 | 7.02 | ..... | 1.82 | .12 | ..... | .34 | 6.37 |
| Washington | 2.69 | 1.35 | 41.35 | .80 | 2.40 | 2.04 | 1.21 | .22 | .31 |
| West Virginia | 3.43 | 1.69 | .67 | ..... | 2.06 | .09 | .42 | .33 | 1.39 |
| Wisconsin | 5.91 | 2.53 | 5.84 | .15 | 5.14 | .47 | .67 | .08 | 3.31 |
| Wyoming | 6.06 | .61 | 25.18 | .11 | 1.83 | ..... | ..... | .06 | 5.50 |

[1] Reports received weekly. [2] Reports received annually.

## FOOT-AND-MOUTH DISEASE IN CALIFORNIA.

Foot-and-mouth disease is reported to be prevalent in California, but no human case has been reported to the Public Health Service.

## SMALLPOX ON CANADIAN BORDER AT WINDSOR, CANADA.

On February 23, officers of the Public Health Service reported an outbreak of virulent smallpox in Windsor, Canada, opposite Detroit, Mich. Forty or fifty cases of smallpox, some of which were hemorrhagic, were said to be in Windsor on February 25, and five deaths had been reported.

Asst. Surg. Gen. C. C. Pierce is in Detroit, and he has been authorized to take such measures as may be necessary to prevent the introduction of the disease from Canada. Ten acting assistant surgeons have been appointed by the Public Health Service to assist in the work of inspection and vaccination.

## MORBIDITY REPORTS FROM CITIES.

*Diphtheria.*—During the week ended February 23, 1924, 105 cities in all parts of the United States reported 1,074 cases of diphtheria. The estimated expectancy for these cities was 1,149 cases. The estimated expectancy is based on the experience of the last 9 years, excluding epidemics.

*Influenza and pneumonia.*—The number of deaths from influenza and pneumonia increased somewhat during the first 8 weeks of the year, but the reports up to February 23, 1924, show great improvement over those for the corresponding period of last year.

*Scarlet fever.*—From December 30, 1923, to February 23, 1924, the reports indicated that there were more cases of scarlet fever in the United States than there were during the corresponding period one year ago. The number of cases reported was greater than the calculated expectancy during the 8 weeks referred to.

*Smallpox.*—The reports of smallpox for the week ended February 23, 1924, show that the neglect of vaccination causes much avoidable illness, suffering, and expense in the United States. Comparatively few cases of this disease were reported from the New England and Middle Atlantic States, but most of the other sections of the country report more cases than were reported last year, and more than the calculated expectancy. One hundred and sixteen cities reported 499 cases for the week, and more than half of these cases were reported by three cities—Atlanta, Ga., 85 cases; Detroit, Mich., 51 cases; and Los Angeles, Calif., 145 cases.

*Typhoid fever.*—Both State and city reports show more cases of typhoid fever during the first 8 weeks of 1924 than were reported for the same period last year. The number of cases is not large, however, only 52 cases being reported for the week ended February 23, 1924, in a population of nearly 29,000,000.

*City reports for week ended February 23, 1924.*

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

If reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1915 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviations from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

| Division, State, and city. | Chicken pox, cases reported. | Diphtheria. | | Influenza. | | Measles, cases reported. | Mumps, cases reported. | Pneumonia, deaths reported. | Scarlet fever. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Cases, estimated expectancy. | Cases reported. | Cases reported. | Deaths reported. | | | | Cases, estimated expectancy. | Cases reported. |
| NEW ENGLAND. | | | | | | | | | | |
| Maine— | | | | | | | | | | |
| Lewiston | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 0 |
| Portland | 17 | 1 | 2 | 0 | 0 | 3 | 18 | 4 | 3 | 0 |
| New Hampshire— | | | | | | | | | | |
| Concord | 0 | 1 | 0 | 0 | 0 | 10 | 0 | 2 | 0 | 0 |
| Vermont— | | | | | | | | | | |
| Barre | 2 | 0 | 0 | ..... | 1 | 2 | 0 | 0 | 1 | 0 |
| Massachusetts— | | | | | | | | | | |
| Boston | 58 | 64 | 70 | 2 | 1 | 197 | 23 | 36 | 52 | 130 |
| Fall River | 7 | 5 | 0 | 1 | 0 | 3 | 1 | 3 | 4 | 6 |
| Springfield | 4 | 4 | 5 | 0 | 0 | 47 | 2 | 4 | 6 | 9 |
| Worcester | ..... | 4 | 7 | 1 | 0 | 6 | ..... | 9 | 9 | 21 |

*City reports for week ended February 23, 1924*—Continued.

| Division, State, and city. | Chicken pox, cases reported. | Diphtheria. | | Influenza. | | Measles, cases reported. | Mumps, cases reported. | Pneumonia, deaths reported. | Scarlet fever. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Cases, estimated expectancy. | Cases reported. | Cases reported. | Deaths reported. | | | | Cases, estimated expectancy. | Cases reported. |
| NEW ENGLAND—con. | | | | | | | | | | |
| Rhode Island— | | | | | | | | | | |
| Pawtucket | ..... | 1 | 0 | 0 | 0 | 0 | ..... | 2 | 1 | 8 |
| Providence | 0 | 15 | 10 | 0 | 0 | 4 | 0 | 14 | 8 | 64 |
| Connecticut— | | | | | | | | | | |
| Bridgeport | 0 | 8 | 4 | 1 | 1 | 1 | 0 | 1 | 4 | 4 |
| Hartford | ..... | 8 | 8 | 1 | 0 | 15 | ..... | 1 | 5 | 45 |
| New Haven | 13 | 3 | 3 | ..... | 1 | 6 | 39 | 11 | 5 | 14 |
| MIDDLE ATLANTIC. | | | | | | | | | | |
| New York— | | | | | | | | | | |
| Buffalo | ..... | 23 | 13 | 0 | 0 | 24 | ..... | 19 | 15 | 22 |
| New York | 257 | 275 | 213 | 101 | 21 | 1,160 | 218 | 255 | 173 | 239 |
| Rochester | 2 | 11 | 0 | 0 | 0 | 1 | 3 | 11 | 13 | 7 |
| Syracuse | 26 | 8 | 5 | 1 | 0 | 53 | 5 | 5 | 15 | 54 |
| New Jersey— | | | | | | | | | | |
| Camden | ..... | 3 | 5 | 0 | 0 | 2 | ..... | 13 | 2 | 2 |
| Newark | 61 | 24 | 12 | 23 | 1 | 64 | 91 | 16 | 22 | 22 |
| Trenton | 1 | 5 | 6 | 0 | 0 | 35 | 0 | 1 | 2 | 6 |
| Pennsylvania— | | | | | | | | | | |
| Philadelphia | 160 | 75 | 121 | 3 | 6 | 42 | 0 | 79 | 56 | 74 |
| Pittsburgh | 93 | 23 | 18 | ..... | 8 | 4 | 70 | 61 | 17 | 22 |
| Reading | 0 | 4 | 1 | 0 | 0 | 3 | 0 | 1 | 2 | 2 |
| Scranton | 10 | 4 | 5 | ..... | 1 | 1 | 1 | 8 | 5 | 2 |
| E. NORTH CENTRAL. | | | | | | | | | | |
| Ohio— | | | | | | | | | | |
| Cincinnati | 36 | 13 | 9 | ..... | 4 | 69 | 6 | 13 | 9 | 14 |
| Cleveland | 52 | 33 | 22 | 5 | 1 | 22 | 248 | 38 | 40 | 19 |
| Columbus | 7 | 3 | 4 | ..... | 2 | 2 | 0 | 4 | 7 | 13 |
| Toledo | 0 | 7 | 9 | ..... | 1 | 25 | 0 | 5 | 14 | 27 |
| Indiana— | | | | | | | | | | |
| Fort Wayne | ..... | 3 | 5 | 0 | 0 | 4 | ..... | 1 | 2 | 3 |
| Indianapolis | 34 | 12 | 11 | ..... | 1 | 13 | 134 | 10 | 12 | 2 |
| South Bend | ..... | 1 | 5 | 0 | 0 | 1 | ..... | 1 | 3 | 7 |
| Terre Haute | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 4 | 2 | 1 |
| Illinois— | | | | | | | | | | |
| Chicago | 141 | 144 | 69 | 35 | 8 | 58 | 113 | 102 | 149 | 91 |
| Cicero | 5 | 2 | 2 | 0 | 0 | 0 | 38 | 1 | 2 | 1 |
| Peoria | 7 | 2 | 0 | 0 | 0 | 0 | 11 | 2 | 5 | 0 |
| Springfield | 6 | 2 | 2 | 2 | 2 | 0 | 2 | 3 | 1 | 2 |
| Michigan | | | | | | | | | | |
| Detroit | 72 | 67 | 66 | 1 | 0 | 108 | 64 | 47 | 78 | 92 |
| Flint | 5 | 6 | 5 | 0 | 0 | 29 | 27 | 1 | 7 | 12 |
| Grand Rapids | ..... | 3 | 4 | 0 | 0 | 3 | ..... | 0 | 7 | 11 |
| Wisconsin— | | | | | | | | | | |
| Madison | 16 | 1 | 0 | 0 | 0 | 2 | ..... | 0 | 3 | 1 |
| Milwaukee | 54 | 16 | 14 | 0 | 0 | 8 | ..... | 0 | 35 | 24 |
| Racine | 8 | 2 | 5 | 0 | 0 | 0 | ..... | 0 | 3 | 24 |
| Superior | 0 | 1 | 2 | 0 | 0 | 0 | ..... | 1 | 1 | 0 |
| W. NORTH CENTRAL. | | | | | | | | | | |
| Minnesota— | | | | | | | | | | |
| Duluth | 14 | 1 | 0 | 0 | 0 | 0 | 2 | 3 | 3 | 1 |
| Minneapolis | ..... | 15 | 19 | ..... | 1 | 13 | ..... | 10 | 30 | 76 |
| St. Paul | ..... | 13 | 20 | 0 | 0 | 37 | ..... | 10 | 21 | 70 |
| Iowa— | | | | | | | | | | |
| Davenport | ..... | 1 | 1 | 0 | ..... | 0 | ..... | ..... | 3 | 2 |
| Sioux City | 4 | 2 | 4 | 0 | ..... | 2 | 0 | ..... | 2 | 2 |
| Waterloo | 0 | 1 | 0 | 0 | ..... | 1 | 20 | ..... | 2 | 4 |
| Missouri— | | | | | | | | | | |
| Kansas City | 10 | 9 | 6 | 2 | 2 | 71 | 9 | 14 | 12 | 10 |
| St. Joseph | 2 | 2 | 0 | 0 | 0 | 21 | 2 | 6 | 2 | 2 |
| St. Louis | 26 | 59 | 38 | 1 | 1 | 9 | 21 | ..... | 27 | 82 |
| North Dakota— | | | | | | | | | | |
| Fargo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| Grand Forks | 1 | 1 | 1 | 0 | ..... | 4 | ..... | ..... | 0 | 0 |
| South Dakota— | | | | | | | | | | |
| Sioux Falls | ..... | 2 | 0 | 0 | 0 | 11 | ..... | 1 | 3 | 3 |

*City reports for week ended February 23, 1924*—Continued.

| Division, State, and city. | Chicken pox, cases reported. | Diphtheria. | | Influenza. | | Measles, cases reported. | Mumps, cases reported. | Pneumonia, deaths reported. | Scarlet fever. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Cases, estimated expectancy. | Cases reported. | Cases reported. | Deaths reported. | | | | Cases, estimated expectancy. | Cases reported. |
| W. NORTH CENTRAL—continued. | | | | | | | | | | |
| Nebraska— | | | | | | | | | | |
| Lincoln | ..... | 1 | 2 | 0 | 0 | 54 | ..... | 3 | 5 | 3 |
| Omaha | 7 | 5 | 2 | 0 | 0 | 114 | ..... | 2 | 11 | 2 |
| Kansas— | | | | | | | | | | |
| Topeka | 28 | 1 | 7 | 0 | 0 | 259 | 0 | 2 | 1 | 1 |
| Wichita | 22 | 1 | 5 | 0 | 0 | 203 | 137 | 2 | 3 | 6 |
| SOUTH ATLANTIC. | | | | | | | | | | |
| Delaware— | | | | | | | | | | |
| Wilmington | ..... | 1 | 2 | 0 | 0 | 0 | ..... | 3 | 1 | 8 |
| Maryland— | | | | | | | | | | |
| Baltimore | 134 | 26 | 10 | 13 | 5 | 63 | 16 | 50 | 33 | 67 |
| Cumberland | ..... | 0 | 0 | 0 | 0 | 0 | ..... | 2 | 1 | 1 |
| Frederick | 0 | 1 | 0 | 0 | 0 | 36 | 0 | 0 | 0 | 1 |
| District of Col.— | | | | | | | | | | |
| Washington | 71 | 13 | 6 | 3 | 3 | 7 | 0 | 23 | 21 | 34 |
| Virginia— | | | | | | | | | | |
| Lynchburg | 5 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 1 | 0 |
| Norfolk | 4 | 1 | 0 | 0 | 0 | 85 | 3 | 11 | 1 | 2 |
| Richmond | 10 | 3 | 4 | ..... | 1 | 34 | 3 | 10 | 3 | 3 |
| Roanoke | 6 | 1 | 1 | 0 | 0 | 0 | 2 | 1 | 1 | 2 |
| West Virginia— | | | | | | | | | | |
| Charleston | 3 | 1 | 1 | 0 | 0 | 0 | 4 | 3 | 0 | 3 |
| Huntington | ..... | 1 | 1 | 0 | 0 | 0 | ..... | 0 | 1 | 0 |
| Wheeling | 7 | 1 | 0 | 0 | 0 | 2 | 8 | 0 | 1 | 4 |
| North Carolina— | | | | | | | | | | |
| Raleigh | 7 | 0 | 0 | 0 | 0 | 12 | 0 | 5 | 0 | 0 |
| Wilmington | 4 | 1 | 0 | 0 | 0 | 23 | 3 | 0 | 0 | 0 |
| Winston-Salem | 0 | 0 | 1 | 0 | 0 | 72 | 0 | 15 | 1 | 14 |
| South Carolina— | | | | | | | | | | |
| Charleston | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 |
| Columbia | 2 | 1 | 0 | 0 | 0 | 41 | 7 | 6 | 0 | 0 |
| Greenville | 0 | 0 | 0 | 0 | 0 | 70 | 6 | 3 | 0 | 0 |
| Georgia— | | | | | | | | | | |
| Atlanta | 3 | 3 | 3 | 5 | 1 | 12 | 2 | 21 | 4 | 6 |
| Brunswick | 0 | 0 | 0 | 0 | 0 | 68 | 0 | 0 | 0 | 0 |
| Savannah | 2 | 1 | 0 | 0 | 0 | 18 | 0 | 7 | 1 | 0 |
| Florida— | | | | | | | | | | |
| St. Petersburg | 0 | ..... | 0 | 0 | 0 | 21 | 0 | 3 | ..... | 0 |
| Tampa | 1 | 2 | 3 | 2 | 0 | 13 | 0 | 2 | 1 | 0 |
| EAST SOUTH CENTRAL. | | | | | | | | | | |
| Kentucky— | | | | | | | | | | |
| Covington | 0 | 1 | 0 | ..... | 2 | 0 | 0 | 4 | 1 | 4 |
| Louisville | 4 | 8 | 2 | 5 | 1 | 2 | 7 | 16 | 4 | 1 |
| Tennessee— | | | | | | | | | | |
| Memphis | 14 | 5 | 5 | 2 | 1 | 55 | 15 | 23 | 2 | 5 |
| Nashville | 5 | 2 | 0 | ..... | 3 | 3 | 0 | 5 | 4 | 0 |
| Alabama— | | | | | | | | | | |
| Birmingham | 8 | 2 | 4 | 7 | 4 | 67 | 18 | 15 | 2 | 1 |
| Mobile | 2 | 1 | 1 | 2 | 1 | 5 | 0 | 2 | 1 | 1 |
| Montgomery | ..... | 1 | 1 | 0 | 0 | 31 | ..... | 0 | 1 | 0 |
| WEST SOUTH CENTRAL. | | | | | | | | | | |
| Arkansas— | | | | | | | | | | |
| Fort Smith | 7 | 0 | 0 | 0 | ..... | 138 | 2 | ..... | 0 | 1 |
| Little Rock | 0 | 1 | 0 | 0 | ..... | 31 | 2 | ..... | 1 | 0 |
| Louisiana— | | | | | | | | | | |
| New Orleans | 15 | 12 | 24 | 7 | 6 | 120 | 0 | 21 | 3 | 0 |
| Shreveport | 0 | ..... | 1 | 0 | 0 | 5 | 1 | 5 | ..... | 2 |
| Oklahoma— | | | | | | | | | | |
| Tulsa | 7 | 1 | 0 | 0 | ..... | 15 | 1 | ..... | 1 | 3 |
| Texas— | | | | | | | | | | |
| Dallas | 5 | 4 | 5 | 1 | 2 | 225 | 22 | 7 | 1 | 4 |
| Galveston | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 1 | 0 | 0 |
| Houston | ..... | 1 | 0 | 0 | 0 | 150 | ..... | 9 | 1 | 0 |
| San Antonio | 3 | 2 | 4 | 0 | 0 | 62 | 1 | 28 | 1 | 1 |

*City reports for week ended February 23, 1924*—Continued.

| Division, State, and city. | Chicken pox, cases reported. | Diphtheria. | | Influenza. | | Measles, cases reported. | Mumps, cases reported. | Pneumonia, deaths reported. | Scarlet fever. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Cases, estimated expectancy. | Cases reported. | Cases reported. | Deaths reported. | | | | Cases, estimated expectancy. | Cases reported. |
| MOUNTAIN. | | | | | | | | | | |
| Montana— | | | | | | | | | | |
| Great Falls | 12 | 1 | 0 | 0 | 0 | 103 | 0 | 0 | 1 | 4 |
| Helena | 0 | ..... | 0 | 0 | 0 | 35 | 0 | 3 | ..... | 0 |
| Missoula | 1 | 1 | 1 | 0 | 0 | 9 | 0 | 0 | 1 | 0 |
| Idaho— | | | | | | | | | | |
| Boise | 4 | 1 | 0 | 0 | 0 | 10 | 0 | 0 | 1 | 0 |
| Colorado— | | | | | | | | | | |
| Denver | 38 | 8 | 23 | ..... | 1 | 63 | 4 | 10 | 10 | 17 |
| Pueblo | 0 | 4 | 1 | 0 | 0 | 225 | 2 | 4 | 1 | 0 |
| New Mexico— | | | | | | | | | | |
| Albuquerque | 9 | 2 | 1 | 0 | 0 | 13 | 0 | 0 | 5 | 0 |
| Utah— | | | | | | | | | | |
| Salt Lake City | 30 | 2 | 2 | ..... | 1 | 417 | 14 | 8 | 4 | 2 |
| Nevada— | | | | | | | | | | |
| Reno | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 0 | 0 |
| PACIFIC. | | | | | | | | | | |
| Washington— | | | | | | | | | | |
| Seattle | 6 | 5 | 11 | 0 | ..... | 369 | 3 | ..... | 10 | 11 |
| Spokane | 16 | 2 | 3 | 0 | ..... | 23 | 0 | ..... | 3 | 18 |
| Tacoma | 2 | 1 | 4 | 0 | ..... | 149 | 3 | ..... | 3 | 1 |
| California— | | | | | | | | | | |
| Los Angeles | ..... | 23 | 61 | 8 | 2 | 149 | ..... | 24 | 14 | 93 |
| Sacramento | 14 | 1 | 5 | 0 | 0 | 14 | 0 | 0 | 1 | 0 |
| San Francisco | 23 | 18 | 56 | 3 | 3 | 109 | 12 | 9 | 15 | 28 |

| Division, State, and city. | Population July 1, 1923, estimated. | Smallpox. | | | Tuberculosis, deaths reported. | Typhoid fever. | | | Whooping cough, cases reported. | Deaths, all causes. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Cases, estimated expectancy. | Cases reported. | Deaths reported. | | Cases, estimated expectancy. | Cases reported. | Deaths reported. | | |
| NEW ENGLAND. | | | | | | | | | | |
| Maine— | | | | | | | | | | |
| Lewiston | 33,790 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 6 |
| Portland | 73,129 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 18 |
| New Hampshire— | | | | | | | | | | |
| Concord | 22,408 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| Vermont— | | | | | | | | | | |
| Barre | [1] 10,008 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Massachusetts— | | | | | | | | | | |
| Boston | 770,400 | 0 | 0 | 0 | 13 | 2 | 2 | 0 | 19 | 245 |
| Fall River | 120,912 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 5 | 27 |
| Springfield | 144,227 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 34 |
| Worcester | 191,927 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | ..... | 56 |
| Rhode Island— | | | | | | | | | | |
| Pawtucket | 68,799 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | ..... | ..... |
| Providence | 242,378 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 91 |
| Connecticut— | | | | | | | | | | |
| Bridgeport | [1] 143,555 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 |
| Hartford | [1] 138,036 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | ..... | 29 |
| New Haven | 172,967 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 39 |
| MIDDLE ATLANTIC. | | | | | | | | | | |
| New York— | | | | | | | | | | |
| Buffalo | 536,718 | 1 | 0 | 0 | 13 | 1 | 0 | 0 | ..... | 146 |
| New York | 5,927,625 | 0 | 0 | 0 | [2] 86 | 9 | 5 | 0 | 104 | 1,518 |
| Rochester | 317,867 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 4 | 70 |
| Syracuse | 184,511 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 42 |
| New Jersey— | | | | | | | | | | |
| Camden | 124,157 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | ..... | 39 |
| Newark | 438,699 | 0 | 0 | 0 | 10 | 1 | 0 | 0 | 14 | 134 |
| Trenton | 127,390 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 29 |

[1] Population Jan. 1, 1920.

[2] Pulmonary only.

*City reports for week ended February 23, 1924*—Continued.

| Division, State, and city. | Population July 1, 1923, estimated. | Smallpox. | | | Tuberculosis, deaths reported. | Typhoid fever. | | | Whooping cough, cases reported. | Deaths, all causes. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Cases, estimated expectancy. | Cases reported. | Deaths reported. | | Cases, estimated expectancy. | Cases reported. | Deaths reported. | | |
| MIDDLE ATLANTIC—continued. | | | | | | | | | | |
| Pennsylvania— | | | | | | | | | | |
| Philadelphia | 1,922,788 | 0 | 0 | 0 | 43 | 5 | 2 | 0 | 23 | 519 |
| Pittsburgh | 613,442 | 0 | 0 | 0 | 12 | 2 | 1 | 1 | 43 | 230 |
| Reading | 110,917 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 35 |
| Scranton | 140,636 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 58 |
| EAST NORTH CENTRAL. | | | | | | | | | | |
| Ohio— | | | | | | | | | | |
| Cincinnati | 406,312 | 1 | 4 | 0 | 14 | 1 | 0 | 0 | 24 | 133 |
| Cleveland | 888,519 | 2 | 2 | 0 | 19 | 2 | 0 | 0 | 40 | 209 |
| Columbus | 261,082 | 0 | 1 | 0 | 5 | 0 | 1 | 1 | 0 | 72 |
| Toledo | 268,338 | 1 | 5 | 0 | 2 | 0 | 1 | 0 | 0 | 62 |
| Indiana— | | | | | | | | | | |
| Fort Wayne | 93,573 | 1 | 10 | 0 | 0 | 0 | 1 | 2 | ..... | 28 |
| Indianapolis | 342,718 | 6 | 20 | 0 | 8 | 1 | 0 | 0 | 24 | 94 |
| South Bend | 76,709 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | ..... | 11 |
| Terre Haute | 68,939 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 6 | 22 |
| Illinois— | | | | | | | | | | |
| Chicago | 2,886,121 | 3 | 2 | 0 | 51 | 3 | 3 | 2 | 31 | 741 |
| Cicero | 55,968 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 5 |
| Peoria | 79,675 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 4 | 10 |
| Springfield | 61,833 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 16 |
| Michigan— | | | | | | | | | | |
| Detroit | 995,668 | 6 | 51 | 1 | 27 | 3 | 0 | 0 | 14 | 267 |
| Flint | 117,968 | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 1 | 23 |
| Grand Rapids | 145,947 | 1 | 2 | 0 | 1 | 1 | 0 | 0 | ..... | 35 |
| Wisconsin— | | | | | | | | | | |
| Madison | 42,519 | 1 | 0 | ..... | ..... | 0 | 0 | ..... | 4 | 6 |
| Milwaukee | 484,595 | 5 | 0 | 0 | 7 | 1 | 2 | 0 | 43 | ..... |
| Racine | 64,393 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| Superior | [1] 39,671 | 2 | 7 | 0 | 1 | 0 | 0 | 0 | 0 | 11 |
| WEST NORTH CENTRAL. | | | | | | | | | | |
| Minnesota— | | | | | | | | | | |
| Duluth | 106,289 | 2 | 15 | 1 | 2 | 0 | 0 | 0 | 0 | 25 |
| Minneapolis | 409,125 | 25 | 1 | 0 | 7 | 1 | 0 | 0 | ..... | 111 |
| St. Paul | 241,891 | 11 | 34 | 0 | 2 | 0 | 0 | 0 | ..... | 60 |
| Iowa— | | | | | | | | | | |
| Davenport | 61,262 | 3 | 4 | ..... | ..... | 0 | 0 | ..... | ..... | ..... |
| Sioux City | 79,062 | 3 | 0 | ..... | ..... | 0 | 0 | ..... | 2 | ..... |
| Waterloo | 39,667 | 0 | 0 | ..... | ..... | 0 | 0 | ..... | 7 | ..... |
| Missouri— | | | | | | | | | | |
| Kansas City | 351,819 | 4 | 0 | 0 | 9 | 1 | 0 | 0 | 6 | 102 |
| St. Joseph | 78,232 | 5 | 0 | 0 | 3 | 0 | 0 | 0 | 6 | 41 |
| St. Louis | 803,353 | 5 | 2 | 0 | 13 | 2 | 0 | 0 | 35 | 225 |
| North Dakota— | | | | | | | | | | |
| Fargo | 24,841 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Grand Forks | 14,547 | 1 | 1 | ..... | ..... | 0 | 0 | ..... | 0 | ..... |
| South Dakota— | | | | | | | | | | |
| Sioux Falls | 29,206 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | ..... | 11 |
| Nebraska— | | | | | | | | | | |
| Lincoln | 58,761 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | ..... | 13 |
| Omaha | 204,382 | 8 | 0 | 0 | 4 | 1 | 0 | 0 | ..... | 54 |
| Kansas— | | | | | | | | | | |
| Topeka | 52,555 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| Wichita | 79,261 | 4 | 12 | 0 | 0 | 0 | 0 | 0 | 8 | 25 |
| SOUTH ATLANTIC. | | | | | | | | | | |
| Delaware— | | | | | | | | | | |
| Wilmington | 117,728 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | ..... | 29 |
| Maryland— | | | | | | | | | | |
| Baltimore | 773,580 | 0 | 1 | 0 | 22 | 3 | 3 | 1 | 21 | 232 |
| Cumberland | 32,261 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ..... | 11 |
| Frederick | 11,301 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| District of Columbia— | | | | | | | | | | |
| Washington | [1] 437,571 | 0 | 4 | 0 | 18 | 1 | 1 | 0 | 10 | 145 |
| Virginia— | | | | | | | | | | |
| Lynchburg | 30,277 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 10 |
| Norfolk | 159,089 | 0 | 0 | 0 | 4 | 0 | 1 | 0 | 10 | ..... |
| Richmond | 131,044 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 5 | 64 |
| Roanoke | 55,502 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |

[1] Population January 1, 1920.

*City reports for week ended February 23, 1924*—Continued.

| Division, State, and city. | Population July 1, 1923, estimated. | Smallpox. | | | Tuberculosis, deaths reported. | Typhoid fever. | | | Whooping cough, cases reported. | Deaths, all causes. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Cases, estimated expectancy. | Cases reported. | Deaths reported. | | Cases, estimated expectancy. | Cases reported. | Deaths reported. | | |
| SOUTH ATLANTIC—continued. | | | | | | | | | | |
| West Virginia— | | | | | | | | | | |
| Charleston | 45,597 | 1 | 19 | 0 | 1 | 0 | 0 | 0 | 7 | 19 |
| Huntington | 57,918 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | ..... | 16 |
| Wheeling | [1] 56,208 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 12 |
| North Carolina— | | | | | | | | | | |
| Raleigh | 29,171 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 9 | 16 |
| Wilmington | 35,719 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| Winston-Salem | 56,230 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 34 |
| South Carolina— | | | | | | | | | | |
| Charleston | 71,245 | 0 | 5 | 0 | 2 | 0 | 0 | 0 | 0 | 22 |
| Columbia | 39,688 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| Greenville | 25,789 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 9 |
| Georgia— | | | | | | | | | | |
| Atlanta | 222,963 | 2 | 85 | 0 | 6 | 0 | 3 | 0 | 1 | 106 |
| Brunswick | 15,937 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Savannah | 89,448 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 35 |
| Florida— | | | | | | | | | | |
| St. Petersburg | 24,403 | ..... | 0 | 0 | 1 | ..... | 0 | 0 | 0 | 19 |
| Tampa | 56,050 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 15 |
| EAST SOUTH CENTRAL. | | | | | | | | | | |
| Kentucky— | | | | | | | | | | |
| Covington | 57,877 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 32 |
| Louisville | 257,671 | 1 | 0 | 0 | 5 | 1 | 1 | 0 | 0 | 95 |
| Tennessee— | | | | | | | | | | |
| Memphis | 170,067 | 2 | 0 | 0 | [a]4 | 0 | 3 | 2 | 1 | 82 |
| Nashville | 121,128 | 1 | 1 | 0 | 4 | 1 | 0 | 0 | 2 | 52 |
| Alabama— | | | | | | | | | | |
| Birmingham | 195,901 | 1 | 8 | 0 | 1 | 1 | 0 | 0 | 4 | 75 |
| Mobile | 63,858 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | ..... |
| Montgomery | 45,383 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | ..... | ..... |
| WEST SOUTH CENTRAL. | | | | | | | | | | |
| Arkansas— | | | | | | | | | | |
| Fort Smith | 30,635 | 0 | 0 | ..... | ..... | 0 | 0 | ..... | 0 | ..... |
| Little Rock | 70,916 | 0 | 1 | ..... | ..... | 1 | 0 | ..... | 0 | ..... |
| Louisiana— | | | | | | | | | | |
| New Orleans | 404,575 | 3 | 2 | 0 | 11 | 1 | 6 | 0 | 0 | 174 |
| Shreveport | 54,590 | ..... | 5 | 0 | 1 | ..... | 0 | 0 | 0 | 26 |
| Oklahoma— | | | | | | | | | | |
| Tulsa | 102,018 | 1 | 1 | ..... | ..... | 0 | 0 | ..... | 2 | ..... |
| Texas— | | | | | | | | | | |
| Dallas | 177,274 | 8 | 1 | 0 | 6 | 0 | 0 | 0 | 3 | 53 |
| Galveston | 46,877 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 13 |
| Houston | 154,970 | 2 | 5 | 0 | 5 | 0 | 0 | 0 | ..... | 46 |
| San Antonio | 184,727 | 0 | 0 | 0 | 15 | 1 | 0 | 0 | 0 | 80 |
| MOUNTAIN. | | | | | | | | | | |
| Montana— | | | | | | | | | | |
| Great Falls | 27,787 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 6 |
| Helena | [1] 12,037 | ..... | 0 | 0 | 0 | ..... | 0 | 0 | 0 | 13 |
| Missoula | [1] 12,668 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Idaho— | | | | | | | | | | |
| Boise | 22,806 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| Colorado— | | | | | | | | | | |
| Denver | 272,031 | 10 | 0 | 0 | 7 | 0 | 1 | 1 | 10 | 86 |
| Pueblo | 43,519 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 13 |
| New Mexico— | | | | | | | | | | |
| Albuquerque | 16,648 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 5 |
| Utah— | | | | | | | | | | |
| Salt Lake City | 126,241 | 4 | 0 | 0 | 1 | 0 | 1 | 0 | 4 | 41 |
| Nevada— | | | | | | | | | | |
| Reno | 12,429 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| PACIFIC. | | | | | | | | | | |
| Washington— | | | | | | | | | | |
| Seattle | [1] 315,685 | 5 | 3 | ..... | ..... | 1 | 0 | ..... | 8 | ..... |
| Spokane | 104,573 | 16 | 25 | ..... | ..... | 0 | 0 | ..... | 0 | ..... |
| Tacoma | 101,731 | 2 | 3 | ..... | ..... | 0 | 2 | ..... | 0 | ..... |
| California— | | | | | | | | | | |
| Los Angeles | 666,853 | 3 | 145 | 0 | 30 | 2 | 4 | 1 | ..... | 238 |
| Sacramento | 69,950 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 16 |
| San Francisco | 539,038 | 4 | 2 | 0 | 13 | 2 | 0 | 1 | 3 | 157 |

[1] Population Jan. 1, 1920.

*City reports for week ended February 23, 1924*—Continued.

| Division, State, and city. | Cerebro-spinal meningitis. | | Lethargic encephalitis. | | Pellagra. | | Poliomyelitis (infantile paralysis). | | | Typhus fever. | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cases. | Deaths. | Cases. | Deaths. | Cases. | Deaths. | Cases, est. expectancy. | Cases. | Deaths. | Cases. | Deaths. |
| **NEW ENGLAND.** | | | | | | | | | | | |
| Massachusetts— | | | | | | | | | | | |
| Boston | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Springfield | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Worcester | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| **MIDDLE ATLANTIC.** | | | | | | | | | | | |
| New York— | | | | | | | | | | | |
| Buffalo | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| New York | 4 | 2 | 3 | 3 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| Rochester | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| New Jersey— | | | | | | | | | | | |
| Newark | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pennsylvania— | | | | | | | | | | | |
| Philadelphia | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Pittsburgh | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **EAST NORTH CENTRAL.** | | | | | | | | | | | |
| Ohio— | | | | | | | | | | | |
| Cleveland | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Toledo | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Illinois— | | | | | | | | | | | |
| Chicago | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Michigan— | | | | | | | | | | | |
| Detroit | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| **WEST NORTH CENTRAL.** | | | | | | | | | | | |
| Minnesota— | | | | | | | | | | | |
| Duluth | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **SOUTH ATLANTIC.** | | | | | | | | | | | |
| Maryland— | | | | | | | | | | | |
| Baltimore | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| West Virginia— | | | | | | | | | | | |
| Huntington | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| North Carolina— | | | | | | | | | | | |
| Raleigh | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Winston-Salem | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| South Carolina— | | | | | | | | | | | |
| Columbia | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| **EAST SOUTH CENTRAL.** | | | | | | | | | | | |
| Tennessee— | | | | | | | | | | | |
| Nashville | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Alabama— | | | | | | | | | | | |
| Birmingham | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| **WEST SOUTH CENTRAL.** | | | | | | | | | | | |
| Louisiana— | | | | | | | | | | | |
| New Orleans | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Texas— | | | | | | | | | | | |
| Dallas | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Houston | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| **PACIFIC.** | | | | | | | | | | | |
| California— | | | | | | | | | | | |
| Los Angeles | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| San Francisco | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

The following table gives a summary of the reports from 105 cities for the eight-week period ended February 23, 1924. The cities included in this table are those whose reports have been published for

all eight weeks in the Public Health Reports. Eight of these cities did not report deaths. The aggregate population of the cities reporting cases was estimated at nearly 29,000,000 on July 1, 1923, which is the latest date for which estimates are available. The cities reporting deaths had more than 28,000,000 population on that date. The number of cities included in each group and the aggregate population are shown in a separate table below.

*Summary of weekly reports from cities, December 30, 1923, to February 23, 1924.*

DIPHTHERIA CASES.

| | 1924, week ended— | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Jan. 5. | Jan. 12. | Jan. 19. | Jan. 26. | Feb. 2. | Feb. 9. | Feb. 16. | Feb. 23. |
| Total | 1,339 | 1,385 | 1,453 | 1,387 | 1,288 | 1,305 | 1,226 | 1,075 |
| New England | 172 | 123 | 130 | 141 | 161 | 136 | 115 | 109 |
| Middle Atlantic | 401 | 476 | 488 | 479 | 410 | 490 | 434 | 394 |
| East North Central | 341 | 352 | 333 | 305 | 291 | 284 | 247 | 225 |
| West North Central | 133 | 102 | 125 | 124 | 125 | 97 | 128 | 102 |
| South Atlantic | 59 | 86 | 112 | 72 | 59 | 50 | 57 | 31 |
| East South Central | 19 | 20 | 15 | 17 | 19 | 13 | 17 | 13 |
| West South Central | 46 | 36 | 38 | 41 | 38 | 33 | 37 | 34 |
| Mountain | 26 | 19 | 19 | 27 | 21 | 21 | 23 | 27 |
| Pacific | 142 | 171 | 193 | 181 | 164 | 181 | 168 | 140 |

MEASLES CASES.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Total | 4,008 | 4,997 | 5,479 | 5,571 | 5,908 | 5,794 | 6,577 | 6,002 |
| New England | 175 | 161 | 176 | 170 | 227 | 265 | 334 | 294 |
| Middle Atlantic | 611 | 639 | 699 | 770 | 899 | 1,004 | 1,183 | 1,388 |
| East North Central | 283 | 356 | 328 | 296 | 330 | 292 | 378 | 322 |
| West North Central | 525 | 444 | 383 | 411 | 522 | 643 | 814 | 835 |
| South Atlantic | 553 | 439 | 499 | 507 | 556 | 508 | 655 | 578 |
| East South Central | 45 | 92 | 98 | 121 | 118 | 98 | 118 | 163 |
| West South Central | 352 | 375 | 370 | 552 | 564 | 511 | 710 | 738 |
| Mountain | 300 | 458 | 434 | 723 | 1,005 | 975 | 1,216 | 871 |
| Pacific | 1,164 | 2,033 | 2,492 | 2,021 | 1,687 | 1,498 | 1,169 | 813 |

SCARLET FEVER CASES.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Total | 1,550 | 1,731 | 1,883 | 1,925 | 1,858 | 1,934 | 1,798 | 1,677 |
| New England | 281 | 287 | 330 | 327 | 368 | 307 | 276 | 301 |
| Middle Atlantic | 386 | 445 | 461 | 530 | 492 | 572 | 525 | 450 |
| East North Central | 413 | 404 | 487 | 419 | 405 | 426 | 383 | 317 |
| West North Central | 190 | 265 | 227 | 245 | 227 | 248 | 258 | 272 |
| South Atlantic | 122 | 113 | 128 | 142 | 145 | 183 | 157 | 142 |
| East South Central | 10 | 27 | 26 | 27 | 12 | 18 | 14 | 12 |
| West South Central | 22 | 20 | 21 | 15 | 19 | 19 | 12 | 8 |
| Mountain | 20 | 25 | 36 | 24 | 24 | 27 | 41 | 24 |
| Pacific | 106 | 145 | 167 | 196 | 166 | 134 | 132 | 151 |

SMALLPOX CASES.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Total | 178 | 341 | 454 | 379 | 368 | 427 | 473 | 486 |
| New England | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 |
| Middle Atlantic | 1 | 1 | 1 | 6 | 3 | 0 | 0 | 0 |
| East North Central | 28 | 58 | 92 | 64 | 74 | 87 | 143 | 101 |
| West North Central | 25 | 49 | 45 | 50 | 36 | 59 | 49 | 65 |
| South Atlantic | 37 | 52 | 81 | 55 | 58 | 118 | 117 | 117 |
| East South Central | 2 | 7 | 4 | 3 | 5 | 8 | 5 | 9 |
| West South Central | 2 | 10 | 6 | 3 | 12 | 6 | 12 | 14 |
| Mountain | 2 | 2 | 4 | 2 | 2 | 4 | 3 | 2 |
| Pacific | 81 | 160 | 221 | 195 | 178 | 145 | 144 | 178 |

*Summary of weekly reports from cities, December 30, 1923, to February 23, 1924*—Continued.

TYPHOID FEVER CASES.

| | 1924, week ended— | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Jan. 5. | Jan. 12. | Jan. 19. | Jan. 26. | Feb. 2. | Feb. 9. | Feb. 16. | Feb. 23. |
| Total | 63 | 81 | 77 | 69 | 78 | 76 | 74 | 52 |
| New England | 2 | 1 | 11 | 1 | 5 | 0 | 3 | 5 |
| Middle Atlantic | 11 | 29 | 30 | 21 | 26 | 24 | 23 | 8 |
| East North Central | 26 | 27 | 16 | 18 | 14 | 8 | 18 | 8 |
| West North Central | 3 | 1 | 3 | 2 | 5 | 7 | 2 | 0 |
| South Atlantic | 7 | 9 | 7 | 11 | 18 | 15 | 7 | 11 |
| East South Central | 6 | 0 | 3 | 8 | 1 | 2 | 2 | 4 |
| West South Central | 4 | 8 | 6 | 4 | 1 | 10 | 3 | 6 |
| Mountain | 1 | 2 | 0 | 0 | 1 | 1 | 4 | 2 |
| Pacific | 3 | 4 | 1 | 4 | 7 | 9 | 12 | 8 |

INFLUENZA DEATHS.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Total | 40 | 76 | 68 | 70 | 82 | 100 | 92 | 99 |
| New England | 4 | 9 | 2 | 6 | 3 | 3 | 5 | 4 |
| Middle Atlantic | 13 | 24 | 32 | 14 | 29 | 33 | 30 | 36 |
| East North Central | 7 | 17 | 11 | 23 | 18 | 19 | 13 | 18 |
| West North Central | 0 | 4 | 10 | 4 | 5 | 6 | 6 | 4 |
| South Atlantic | 6 | 5 | 1 | 6 | 5 | 14 | 17 | 10 |
| East South Central | 3 | 6 | 4 | 3 | 7 | 13 | 6 | 12 |
| West South Central | 3 | 5 | 2 | 6 | 10 | 7 | 11 | 8 |
| Mountain | 2 | 1 | 0 | 1 | 0 | 2 | 0 | 2 |
| Pacific | 8 | 5 | 6 | 7 | 5 | 3 | 4 | 5 |

PNEUMONIA DEATHS.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Total | 852 | 1,105 | 1,054 | 1,002 | 1,120 | 1,064 | 1,125 | 1,191 |
| New England | 52 | 80 | 78 | 51 | 73 | 73 | 79 | 87 |
| Middle Atlantic | 328 | 448 | 422 | 409 | 463 | 421 | 407 | 461 |
| East North Central | 182 | 203 | 202 | 177 | 222 | 216 | 255 | 226 |
| West North Central | 59 | 67 | 73 | 70 | 64 | 46 | 52 | 50 |
| South Atlantic | 97 | 143 | 132 | 129 | 123 | 134 | 146 | 171 |
| East South Central | 35 | 43 | 30 | 50 | 62 | 63 | 65 | 65 |
| West South Central | 28 | 44 | 47 | 60 | 64 | 53 | 59 | 71 |
| Mountain | 28 | 32 | 30 | 20 | 21 | 24 | 30 | 27 |
| Pacific | 43 | 45 | 40 | 36 | 28 | 34 | 32 | 33 |

*Number of cities included in summary of weekly reports and aggregate population of cities in each group, estimated as of July 1, 1923.*

| Group of cities. | Number of cities reporting— | | Aggregate population of cities reporting— | |
|---|---|---|---|---|
| | Cases. | Deaths. | Cases. | Deaths. |
| Total | 105 | 97 | 28,898,350 | 28,140,934 |
| New England | 12 | 12 | 2,098,746 | 2,098,746 |
| Middle Atlantic | 10 | 10 | 10,304,114 | 10,304,114 |
| East North Central | 17 | 17 | 7,032,535 | 7,032,535 |
| West North Central | 14 | 11 | 2,515,330 | 2,381,454 |
| South Atlantic | 22 | 22 | 2,566,901 | 2,566,901 |
| East South Central | 7 | 7 | 911,885 | 911,885 |
| West South Central | 8 | 6 | 1,124,564 | 1,023,013 |
| Mountain | 9 | 9 | 546,445 | 546,445 |
| Pacific | 6 | 3 | 1,797,830 | 1,275,841 |

# FOREIGN AND INSULAR.

## CANADA.

### Mortality Rates—Province of Ontario—1921.

The following mortality rates for the Province of Ontario, Canada, are taken from the report for the year 1921, the latest annual report available:

There were registered in the Province 34,551 deaths during the year. This is a rate of 11.8 per 1,000 of population and is the lowest rate since 1898, when it was 11.5. In the cities the rate was 12.8 as compared with 15.0 in 1920; in the towns the rate was 14.5 as compared with 18.1 for the previous year; while the rural rate was 10.8 as compared with 12.7 in 1920. Of the total deaths, 18,062 were of males and 16,489 were of females. It is to be noted that whereas in 1920 the cities contributed the largest number of deaths, the situation was reversed in 1921, the rural parts of the Province contributing 17,371 deaths while the cities contributed 14,907 deaths.

Organic heart disease showed the largest death rate, with 96.1 per 100,000 of population, cancer coming next with 88.2; followed by tuberculosis with 73.4, and pneumonia with 72.3; disease of the arteries with 62.2; apoplexy with 53.0; infantile diarrhea with 44.9, and Bright's disease with 33.4, broncho-pneumonia with 30.2 and diphtheria with 22.2. Except during the influenza years of 1918 and 1920, organic heart disease shows by far the highest death rate during the ten years from 1912 to 1921, inclusive. The death rate from tuberculosis was the lowest ever recorded in the Province, while the death rate from cancer was the highest ever reached by this disease. The cancer death rate has increased from 68.9 in 1912 to 88.2 in 1921.

## CUBA.

### Communicable Diseases.

Communicable diseases have been reported in Cuba as follows:

*Habana.*

| Disease. | Feb. 11-20, 1924. | | Remaining under treatment Feb. 20, 1924. |
|---|---|---|---|
| | New cases. | Deaths. | |
| Cerebrospinal meningitis | ---- | ---- | [1] 2 |
| Chicken pox | 12 | ---- | 13 |
| Diphtheria | 2 | ---- | 4 |
| Leprosy | ---- | ---- | 14 |
| Malaria | 19 | ---- | [2] 18 |
| Measles | ---- | ---- | 1 |
| Scarlet fever | 3 | ---- | 4 |
| Typhoid fever | 10 | 5 | [3] 17 |

[1] From the interior, 1. [2] From the interior, 9. [3] From the interior, 4.

*Provinces.*

JANUARY 1-10, 1924.

| Province. | Cerebro-spinal menin-gitis. | Chicken pox. | Diphthe-ria. | Malaria. | Measles. | Paraty-phoid fever. | Scarlet fever. | Typhoid fever. |
|---|---|---|---|---|---|---|---|---|
| Camaguey | | | | 62 | | | | 3 |
| Habana | 1 | 5 | 7 | 19 | 4 | | 1 | 11 |
| Matanzas | | 1 | 1 | | | | | 2 |
| Oriente | | 3 | 1 | 45 | | 1 | | 2 |
| Pinar del Rio | | | 1 | | 2 | 1 | | |
| Santa Clara | | 10 | 1 | 7 | | | | 3 |
| Total | 1 | 19 | 11 | 133 | 6 | 2 | 1 | 21 |

JANUARY 11-20, 1924.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Camaguey | | 1 | | 52 | | | | 1 |
| Habana | 1 | 21 | 6 | 17 | 4 | | | 7 |
| Matanzas | | | | | | | | |
| Oriente | | 3 | 1 | 66 | | 1 | | 1 |
| Pinar del Rio | | | 2 | | | | | |
| Santa Clara | | 1 | 2 | 2 | | 1 | | 1 |
| Total | 1 | 26 | 11 | 137 | 4 | 2 | | 10 |

JANUARY 21-31, 1924.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Camaguey | | | | 67 | | | | 2 |
| Habana | | 9 | 8 | 15 | 13 | 1 | 2 | 5 |
| Matanzas | | | | | | | | |
| Oriente | | 4 | | 29 | | 1 | | 3 |
| Pinar del Rio | | 4 | 1 | 1 | 1 | | | 2 |
| Santa Clara | | | | 1 | | | | 4 |
| Total | | 17 | 9 | 113 | 14 | 2 | 2 | 16 |

## GREAT BRITAIN.

### Deaths from Influenza in Great Towns of England and Wales, First Seven Weeks of 1924.

The figures given in the following table are taken from the Weekly Return of Births and Deaths Registered in County Boroughs and Other Great Towns in England and Wales, issued by the Registrar General of England and Wales. The aggregate population of the boroughs and towns is estimated at about 19,200,000.

| Week ended— | Number of deaths. | Week ended— | Number of deaths. |
|---|---|---|---|
| Jan. 5, 1924 | 98 | Feb. 2, 1924 | 367 |
| 12, 1924 | 93 | 9, 1924 | 501 |
| 19, 1924 | 153 | 16, 1924 | 615 |
| 26, 1924 | 236 | 23, 1924 | 626 |

## JAVA.

### Plague—December, 1923.

During the month of December, 1923, there were reported in the Island of Java, 1,064 deaths from plague. For distribution of mortality by provinces, see page 550.

## MALTA.

### Communicable Diseases—January 16–31, 1924.

During the period January 16–31, 1924, communicable diseases were reported in the Island of Malta as follows: Influenza, 216 cases; malaria, 1 case; pneumonia, 9 cases; trachoma, 10 cases; undulant fever, 30 cases; whooping cough, 178 cases. (Population, 216,702.)

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

The reports contained in the following tables must not be considered as complete or final as regardseither the list of countries included or the figures for the particular countries for which reports are given.

### Reports Received During Week Ended March 14, 1924.[1]

#### CHOLERA.

| Place. | Date. | Cases. | Deaths. | Remarks. |
|---|---|---|---|---|
| India: | | | | |
| Calcutta | Jan. 13–19 | 25 | 23 | |
| Indo-China: | | | | |
| Saigon | Dec. 31-Jan. 5 | 1 | 1 | Including 100 square kilometers in surrounding country. |
| Siam: | | | | |
| Bangkok | Jan. 6–19 | 4 | 3 | |

#### PLAGUE.

| | | | | |
|---|---|---|---|---|
| Ceylon: | | | | |
| Colombo | Jan. 20–26 | 14 | 7 | Plague rodents, 4. |
| China: | | | | |
| Nanking | Jan. 27–Feb. 9 | | | Present. |
| India: | | | | |
| Bombay | Jan. 13–19 | 2 | | |
| Rangoon | Jan. 13–19 | 2 | 3 | |
| Iraq: | | | | |
| Bagdad | Dec. 9–15 | 1 | 1 | |
| Do | Dec. 23–29 | 1 | 1 | |
| Do | Jan. 6–12 | 4 | 2 | |
| Java | | | | December 1–31, 1923: Deaths, 1,064. |
| Provinces— | | | | |
| Djokjakarta | Dec. 1–31 | | 53 | |
| Kedoe | do | | 591 | |
| Pekalongan | do | | 79 | |
| Samarang | do | | 94 | |
| Soerabaya | do | | 4 | |
| Soerakarta | do | | 243 | |
| Siam: | | | | |
| Bangkok | Jan. 13–19 | 1 | 1 | |
| Straits Settlements: | | | | |
| Singapore | Jan. 6–12 | 2 | 2 | |
| Syria: | | | | |
| Beirut | Jan. 1–10 | 1 | | |

#### SMALLPOX.

| | | | | |
|---|---|---|---|---|
| Brazil: | | | | |
| Pernambuco | Jan. 20–26 | | 5 | |
| Canada: | | | | |
| British Columbia— | | | | |
| Victoria | Feb. 10–16 | 1 | | |
| Manitoba— | | | | |
| Winnipeg | Feb. 23–29 | 5 | | |
| Ontario— | | | | |
| Windsor | Feb. 15–28 | 26 | 5 | |
| Ceylon: | | | | |
| Colombo | Jan. 13–26 | 3 | | |

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

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

### Reports Received During Week Ended March 14, 1924—Continued.

#### SMALLPOX—Continued.

| Place. | Date. | Cases. | Deaths. | Remarks. |
|---|---|---|---|---|
| China: | | | | |
| Amoy | Jan. 20–26 | | 2 | |
| Antung | Jan. 21–Feb. 3 | 2 | 1 | |
| Foochow | Jan. 13–Feb. 2 | | | Present. |
| Hongkong | Jan. 6–19 | 192 | 251 | |
| Nanking | Jan. 27–Feb. 9 | | | Do. |
| Shanghai | do | 4 | 8 | Cases, foreign. |
| Chosen (Korea): | | | | |
| Chemulpo | Jan. 1–31 | 1 | | |
| Costa Rica: | | | | |
| Port Limon | Feb. 18–24 | 1 | | |
| Dominican Republic: | | | | |
| La Romana | Jan. 27–Feb. 2 | 8 | | |
| Haiti: | | | | |
| Cape Haitien | Feb. 3–9 | 3 | | |
| Hinche | Feb. 10–16 | 1 | | |
| India: | | | | |
| Bombay | Jan 13–19 | 26 | 14 | |
| Karachi | Jan. 27–Feb. 2 | 1 | | |
| Rangoon | Jap. 13–19 | 1 | | |
| Indo-China: | | | | |
| Saigon | Dec. 9–29 | 64 | 40 | Including 100 square kilometers of surrounding country. |
| Do | Dec. 31–Jan. 19 | 85 | 56 | |
| Iraq: | | | | |
| Bagdad | Dec. 9–15 | 12 | 6 | |
| Do | Dec. 23–29 | 9 | 6 | |
| Do | Dec. 30–Jan. 12 | 22 | 18 | |
| Java: | | | | |
| East Java— | | | | |
| Soerabaya | Dec. 16–29 | 22 | 17 | |
| Do | Dec. 30–Jan. 5 | 37 | 10 | |
| West Java— | | | | |
| Batavia | Jan. 5–11 | 1 | | |
| Mexico: | | | | |
| Guadalajara | Jan. 27–Feb. 23 | | 3 | |
| Persia: | | | | |
| Teheran | Nov. 23–Dec. 23 | | 2 | |
| Portugal: | | | | |
| Lisbon | Jan. 14–Feb. 2 | 9 | 1 | |
| Oporto | Jan. 27–Feb. 2 | 12 | 11 | |
| Siam: | | | | |
| Bangkok | Jan. 6–12 | 1 | | |
| Straits Settlements: | | | | |
| Singapore | Jan. 13–19 | 1 | | |

#### TYPHUS FEVER.

| | | | | |
|---|---|---|---|---|
| Algeria: | | | | |
| Algiers | Feb. 1–10 | 1 | 1 | |
| Egypt: | | | | |
| Alexandria | Jan. 22–28 | 1 | | |
| Cairo | Dec. 10–16 | 2 | | |
| Greece: | | | | |
| Athens | Jan. 11–20 | | 1 | |
| Hungary: | | | | |
| Budapest | Jan. 27–Feb. 2 | 4 | 2 | |
| Java: | | | | |
| East Java— | | | | |
| Soerabaya | Dec. 16–29 | 8 | | |
| Do | Dec. 30–Jan. 5 | 2 | | |
| Mexico: | | | | |
| Guadalajara | Jan. 27–Feb. 16 | | 2 | |
| San Luis Potosi | Feb. 17–23 | | 1 | |
| Portugal: | | | | |
| Oporto | Jan. 27–Feb. 2 | 2 | | |

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

### Reports Received from December 29, 1923, to March 7, 1924.[1]

#### CHOLERA.

| Place. | Date. | Cases. | Deaths. | Remarks. |
|---|---|---|---|---|
| China: | | | | |
| Hongkong | Nov. 18–24 | 1 | | |
| India | | | | Oct. 14–Dec. 8, 1923: Cases, 9,691; deaths, 6,153. |
| Bombay | Dec. 23–29 | 1 | 1 | |
| Calcutta | Nov. 11–Dec. 29 | 85 | 69 | |
| Do | Dec. 30–Jan. 12 | 62 | 49 | |
| Madras | Nov. 25–Dec. 29 | 15 | 5 | |
| Do | Dec. 30–Jan. 19 | 3 | 1 | |
| Rangoon | Nov. 11–Dec. 29 | 8 | 5 | |
| Siam: | | | | |
| Bangkok | Nov. 18–Dec. 8 | 4 | 2 | |
| Do | Dec. 31–Jan. 5 | 2 | 1 | |
| Turkey: | | | | |
| Constantinople | Dec. 2–8 | | 1 | |

#### PLAGUE.

| | | | | |
|---|---|---|---|---|
| Azores: | | | | |
| St. Michael Island | Oct. 20–Nov. 10 | 9 | 5 | At localities 3 to 9 miles from port of Ponta Delgada. |
| Bolivia: | | | | |
| La Paz | Oct. 1–31 | | 3 | |
| Brazil: | | | | |
| Bahia | Nov. 11–Dec. 22 | 5 | 3 | |
| Do | Dec. 30–Jan. 19 | 4 | 5 | |
| Rio de Janerio | Jan. 20–26 | 1 | | |
| British East Africa: | | | | |
| Kenya— | | | | |
| Mombasa | Oct. 14–20 | 1 | 1 | Infected rats, 2. Dec. 9–15, 1923: Cases, 4; deaths, 2; removed from vessel arrived Dec. 11, 1923. |
| Do | Dec. 30–Jan. 5 | 1 | 1 | |
| Nairobi | Nov. 1–21 | 40 | | In rural districts, several hundred. |
| Tanganyika | | | | To Nov. 24, 1923: Cases, 39; deaths, 25. |
| Uganda | Aug. 1–Oct. 31 | 734 | 719 | |
| Entebbe | Oct. 1–Nov. 30 | 191 | 183 | |
| Canary Islands: | | | | |
| Las Palmas | Oct. 15–Nov. 15 | 14 | 14 | |
| Santa Cruz de Teneriffe | Feb. 5 | 1 | | |
| San Juan de la Rambla | Dec. 11 | 1 | | Locality 52 km. from Teneriffe. |
| Celebes Island | Nov. 30 | | | Epidemic. |
| Ceylon: | | | | |
| Colombo | Nov. 11–Dec. 29 | 31 | 21 | Plague rodents, 24. |
| Do | Dec. 30–Jan. 19 | 31 | 22 | Plague rodents, 10. |
| China: | | | | |
| Nanking | Dec. 16–29 | | | Present. |
| Do | Dec. 30–Jan. 12 | | | Do. |
| Ecuador: | | | | |
| Guayaquil | Nov. 16–Dec. 15 | 15 | 6 | Rats taken, 35,070; found infected, 94. |
| Jipijapa | ....do | | | Present. |
| Quito | Nov. 1–30 | 11 | 1 | |
| Vino del Milagro | Dec. 1–15 | 1 | | |
| Egypt | | | | Jan. 1–Dec. 27, 1923; Cases, 1,518; deaths, 724. |
| City— | | | | |
| Alexandria | Jan. 1–Dec. 27 | 65 | 33 | |
| Cairo | ....do | 2 | 2 | |
| Port Said | ....do | 51 | 29 | |
| Suez | ....do | 46 | 24 | |
| Hawaii: | | | | |
| Honokaa | | | | Jan. 8–10, 1924: Three plague-infected rodents. |
| Paauhau | | | | Dec. 14, 1923: One plague rat. |
| India | | | | Oct. 14–Dec. 8, 1923; Cases 25,781 deaths, 17,435. |
| Bombay | Oct. 28–Dec. 22 | 5 | 5 | |
| Do | Dec. 30–Jan. 5 | 2 | 2 | |
| Calcutta | Dec. 23–29 | 1 | 1 | |
| Do | Jan. 6–12 | 1 | 1 | |
| Karachi | Nov. 11–Dec. 29 | 42 | 33 | |
| Do | Dec. 30–Jan. 12 | 3 | 1 | |
| Madras Presidency | Nov. 4–Dec. 29 | 1,657 | 1,021 | |
| Rangoon | ....do | 20 | 15 | |
| Do | Dec. 30–Jan. 12 | 4 | 4 | |

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

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

### Reports Received from December 29, 1923, to March 7, 1924—Continued.

#### PLAGUE—Continued.

| Place. | Date. | Cases. | Deaths. | Remarks. |
|---|---|---|---|---|
| Indo-China: | | | | |
| Saigon | Oct. 28–Dec. 8 | 19 | 6 | Including 100 square kilometers in surrounding country. |
| Iraq: | | | | |
| Bagdad | Nov. 11–Dec. 8 | 6 | 4 | |
| Java | | | | Oct. 1–Dec. 31, 1923: Deaths, 1,844 |
| Province— | | | | |
| Djokjakarta | Oct. 1–Nov. 30 | | 93 | |
| Kedoe | do | | 696 | |
| Pekalongan | do | | 71 | |
| Samarang | do | | 336 | Nov. 11–24, 1923: Cases, 2; deaths, 2. Dec. 9–15, 1923: Cases, 2; deaths, 2. |
| Soerabaya | do | | 5 | |
| Soerakarta | ds | | 643 | |
| Madagascar: | | | | |
| Tananarive Province | Oct. 1–Dec. 15 | 210 | 176 | Bubonic, pneumonic, septicemic. |
| Tananarive town | do | 64 | 64 | |
| Paraguay: | | | | |
| Asuncion | Dec. 18 | 6 | 4 | |
| Peru | | | | Nov. 1–Dec. 31, 1923: Cases, 38, deaths, 24. |
| Locality— | | | | |
| Canete | Nov. 1–30 | 1 | 1 | |
| Chancay | Dec. 1–31 | 2 | | |
| Chepen | Nov. 1–30 | 1 | | |
| Chiclayo | Nov. 1–Dec. 31 | 2 | 1 | |
| Lima (city) | do | 22 | 15 | |
| Lima (country) | do | 8 | 7 | |
| Lurin | do | 2 | | |
| Portugal: | | | | |
| Lisbon | Dec. 13–21 | 7 | | |
| Do | Dec. 31–Jan. 6 | | 1 | |
| Portuguese West Africa: | | | | |
| Angola— | | | | |
| Loanda | Oct.–Nov. | 59 | 23 | |
| Siam: | | | | |
| Bangkok | Nov. 4–Dec. 8 | 3 | 2 | |
| Spain: | | | | |
| Malaga | Dec. 17 | 2 | | |
| Straits Settlements: | | | | |
| Singapore | Nov. 11–Dec. 22 | 4 | 4 | |
| Do | Dec. 30–Jan. 5 | 2 | 2 | |
| Syria: | | | | |
| Beirut | Nov. 1–Dec. 10 | 3 | | |
| Turkey: | | | | |
| Constantinople | Dec. 2–22 | 6 | 3 | |
| Union of South Africa: | | | | |
| Cape Province— | | | | |
| Uitenhage district | Dec. 9–15 | | | Plague rodent found in vicinity Haarhoff's Kraal farm. |
| Orange Free State— | | | | |
| Kroonstad district | Dec. 16–27 | 7 | 3 | At Zandfontein farm, Bothaville area: Cases, white, 4; native, 3; deaths, white, 1; native, 2. |
| Wonderfontein farm | Dec. 2–8 | 4 | | Vicinity of Hoopstad. At Hoopstad, Dec. 9–15, 1923, one death of case previously reported. |
| On vessel: | | | | |
| Ship ——— | Dec. 11 | 4 | 2 | At Mombasa, British East Africa. |

#### SMALLPOX.

| | | | | |
|---|---|---|---|---|
| Algeria: | | | | |
| Algiers | Nov. 1–30 | 1 | | |
| Arabia: | | | | |
| Aden | Dec. 16–22 | 1 | | Imported. |
| Do | Jan. 13–19 | 1 | | |
| Belgium: | | | | |
| Brussels | do | 10 | | |
| Bolivia: | | | | |
| La Paz | Oct. 1–Dec. 31 | 45 | 15 | |
| Brazil: | | | | |
| Bahia | Jan. 6–12 | 2 | | |
| Pernambuco | Nov. 4–Dec. 1 | 15 | 3 | |
| Do | Jan. 6–12 | | 1 | |
| Porto Alegre | Dec. 23–29 | | 1 | |
| Do | Dec. 30–Jan. 5 | | 1 | |
| Rio de Janeiro | Nov. 18–24 | 3 | 1 | |
| Do | Jan. 6–26 | 3 | 1 | |
| Sao Paulo | Sept. 3–9 | 1 | | |

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

### Reports Received from December 29, 1923, to March 7, 1924—Continued.

SMALLPOX—Continued.

| Place. | Date. | Cases. | Deaths. | Remarks. |
|---|---|---|---|---|
| British East Africa: | | | | |
| Tanganyika Territory | Sept. 30–Oct. 27 | 14 | 1 | |
| Do | Nov. 25–Dec. 29 | 8 | 3 | |
| Uganda | Sept. 1–30 | 6 | 1 | |
| Entebbe | Oct. 1–Nov. 30 | 4 | 1 | |
| Zanzibar | Sept. 1–Oct. 31 | 116 | 18 | Sept. 1–30, 1923: In areas 27 miles from town of Zanzibar. Oct. 1–31, 1923: In vicinity, 1 case, 1 death. In Mikokotoni district, 30 cases, 14 deaths reported. |
| Canada: | | | | |
| Alberta— | | | | |
| Calgary | Jan. 27–Feb. 16 | 7 | ..... | |
| British Columbia— | | | | |
| Vancouver | Dec. 22–29 | 10 | ..... | |
| Do | Dec. 30–Jan. 26 | 17 | ..... | |
| Manitoba— | | | | |
| Winnipeg | Nov. 25–Dec. 29 | 21 | ..... | |
| Do | Dec. 30–Feb. 15 | 51 | ..... | |
| New Brunswick— | | | | |
| Madawaska County | Dec. 8–15 | 1 | ..... | |
| Restigouche County | Jan. 20–Feb. 16 | 3 | ..... | |
| Victoria County | do | 2 | ..... | |
| Westmoreland County | do | 3 | ..... | |
| Ontario | ..... | ..... | ..... | Jan. 1–31, 1924: Cases, 50. |
| Fort William and Port Arthur. | Dec. 16–29 | 3 | ..... | Occurring at Fort William. |
| London | Feb. 3–9 | 1 | ..... | |
| North Bay | do | 1 | ..... | |
| Quebec— | | | | |
| Montreal | Nov. 30–Feb. 23 | 7 | ..... | |
| Saskatchewan— | | | | |
| Regina | Dec. 9–15 | 1 | ..... | |
| Do | Dec. 30–Feb. 9 | 5 | 1 | |
| Ceylon: | | | | |
| Colombo | Nov. 11–17 | 1 | ..... | Port case. |
| Chile: | | | | |
| Antofagasta | Jan. 6–19 | 4 | 1 | |
| Concepcion | Oct. 1–Dec. 31 | ..... | 14 | |
| Talcahuano | Nov. 26–Dec. 2 | 3 | ..... | Dec. 22, 1923: Five cases present. |
| Valparaiso | Dec. 9–15 | ..... | 1 | |
| China: | | | | |
| Amoy | Nov. 18–Dec. 8 | ..... | ..... | Present. |
| Do | Jan. 6–12 | ..... | ..... | Do. |
| Antung | Dec. 31–Jan. 13 | 4 | 1 | |
| Canton | Dec. 23–Jan. 13 | ..... | ..... | Do. |
| Chungking | Nov. 4–Dec. 29 | ..... | ..... | Present and endemic. |
| Do | Dec. 30–Jan. 12 | ..... | ..... | Present. |
| Foochow | Nov. 4–Dec. 15 | ..... | ..... | Do. |
| Do | Dec. 31–Jan. 12 | ..... | ..... | Do. |
| Hongkong | Oct. 28–Dec. 29 | 718 | 630 | |
| Do | Dec. 30–Jan. 5 | 100 | 73 | |
| Manchuria— | | | | |
| Dairen | Dec. 31–Jan. 30 | 2 | ..... | |
| Harbin | Nov. 12–Dec. 22 | 36 | ..... | |
| Do | Jan. 1–7 | ..... | 5 | |
| Nanking | Dec. 2–15 | ..... | ..... | Do. |
| Do | Dec. 30–Jan. 26 | ..... | ..... | Do. |
| Shanghai | Dec. 29 | ..... | ..... | Prevalent. |
| Do | Jan. 6–26 | 11 | 26 | Cases, foreign. |
| Chosen (Korea): | | | | |
| Seoul | Nov. 1–30 | 1 | ..... | |
| Colombia: | | | | |
| Buenaventura | Nov. 18–Dec. 15 | 8 | ..... | |
| Ecuador: | | | | |
| Esmeraldas | Nov. 16–30 | 4 | ..... | |
| Quito | Nov. 1–30 | 167 | 26 | |
| Egypt: | | | | |
| Port Said | Nov. 24–Dec. 2 | 1 | ..... | |
| Esthonia | ..... | ..... | ..... | Nov. 1–30, 1923: Cases, 32. Dec. 1–31, 1923: Cases, 6. |
| Greece: | | | | |
| Saloniki | Oct. 22–Dec. 30 | ..... | 11 | |
| Do | Dec. 31–Jan. 27 | 2 | 1 | |

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

### Reports Received from December 29, 1923, to March 7, 1924—Continued.

#### SMALLPOX—Continued.

| Place. | Date. | Cases. | Deaths. | Remarks. |
|---|---|---|---|---|
| Guadeloupe (West Indies) | | | | Jan. 2-16: Present. |
| Basse Terre | Dec. 18 | | | Present. |
| Do | Jan. 12 | | | Do. |
| Marie Galante | Dec. 18 | | | Off shore island; present. |
| Moule | Jan. 12 | | | Present. |
| Point à Pitre | Dec. 18 | | | Present in vicinity. |
| India | | | | Oct. 14-Dec. 8, 1923: Cases, 6,544; deaths, 1,355. |
| Bombay | Oct. 28-Dec. 29 | 55 | 25 | |
| Do | Dec. 30-Jan. 19 | 52 | 28 | |
| Calcutta | Dec. 16-29 | 4 | 4 | |
| Do | Dec. 30-Jan. 5 | 1 | 1 | |
| Karachi | Dec. 30-Jan 19 | 3 | | |
| Madras | Nov. 4-Dec. 29 | 23 | 3 | |
| Do | Dec. 30-Jan. 19 | 22 | 1 | |
| Rangoon | Nov. 4-Dec. 29 | 12 | 4 | |
| Do | Dec. 30-Jan. 5 | 1 | | |
| Indo-China: | | | | |
| City— | | | | |
| Saigon | Nov. 4-Dec. 8 | 69 | 34 | Including 100 square kilometers of surrounding country. |
| Iraq: | | | | |
| Bagdad | Oct. 24-Dec. 8 | 25 | 16 | |
| Jamaica | | | | Nov. 25-Dec. 29, 1923: Cases, 115. |
| Do | | | | Dec. 30, 1923-Feb. 2, 1924: Cases, 100. (Reported as alastrim.) |
| Do | | | | |
| Kingston | Nov. 25-Dec. 29 | 3 | | |
| Do | Dec. 30-Feb. 2 | 6 | | |
| Japan: | | | | |
| Taiwan | Jan. 1-10 | 6 | | |
| Tokyo | Jan. 1-23 | 46 | | |
| Java: | | | | |
| East Java— | | | | |
| Surabaya | Oct. 28-Dec. 15 | 326 | 43 | |
| Do | Dec. 9-15 | 107 | 15 | |
| West Java— | | | | |
| Batavia | Oct. 27-Dec. 28 | 65 | 13 | |
| Do | Dec. 29-Jan. 4 | 17 | 4 | |
| Latvia | | | | Oct. 1-Dec. 31, 1923: Cases, 6. |
| Mexico: | | | | |
| Manzanillo | Dec. 4-10 | 5 | 1 | |
| Mexico City | Nov. 25-Dec. 29 | 32 | | Including municipalities in Federal district. |
| Do | Jan. 30-Feb. 9 | 65 | 23 | Do. |
| Tampico | Jan. 27 | | | Present among military. |
| Vera Cruz | Nov. 3-Dec. 30 | | 4 | |
| Do | Jan. 6-27 | 1 | 2 | |
| Netherlands: | | | | |
| Rotterdam | Jan. 20-26 | 3 | | |
| Palestine: | | | | |
| Jaffa | Jan. 15-28 | 3 | | |
| Persia: | | | | |
| Teheran | Sept. 24-Nov. 22 | | 2 | |
| Poland | | | | Sept. 23-Dec. 8, 1923: Cases, 46; deaths, 7. |
| Portugal: | | | | |
| Lisbon | Nov. 11-Dec. 29 | 19 | 10 | |
| Do | Dec. 31-Jan. 26 | 14 | 3 | |
| Oporto | Nov. 25-Dec. 29 | 39 | 23 | |
| Do | Dec. 30-Feb. 9 | 39 | 21 | |
| Portuguese East Africa: | | | | |
| Lourenco Marques | Dec. 30-Jan. 5 | 2 | | |
| Siam: | | | | |
| Bangkok | Oct. 28-Dec. 8 | 33 | 18 | Nov. 25-Dec. 1, 1923; Epidemic. |
| Do | Dec. 30-Jan. 5 | 1 | 1 | |
| Siberia: | | | | |
| Dauria Station | Oct. 21 | | | Present. Locality on Chita Railway, Manchurian frontier. |
| Sierra Leone: | | | | |
| Sherbro District— | | | | |
| Tagbail | Nov. 1-15 | 3 | | |
| Spain: | | | | |
| Barcelona | Nov. 15-Dec. 26 | | 2 | |
| Do | Jan. 3-9 | | 2 | |
| Valencia | Nov. 25-Dec. 29 | 152 | 12 | |
| Do | Dec. 30-Feb. 9 | 145 | 15 | |

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

### Reports Received from December 29, 1923, to March 7, 1924—Continued.

#### SMALLPOX—Continued.

| Place. | Date. | Cases. | Deaths. | Remarks. |
|---|---|---|---|---|
| Straits Settlements: | | | | |
| Singapore | Dec. 16-29 | 2 | 1 | |
| Do | Dec. 30-Jan. 5 | 1 | | |
| Switzerland: | | | | |
| Basel | Jan. 27-Feb. 2 | 1 | | |
| Berne | Nov. 18-Dec. 22 | 12 | | Corrected. |
| Do | Jan. 6-Feb. 2 | 7 | | |
| Lucerne | Nov. 1-30 | 34 | | |
| Do | Dec. 1-31 | 26 | | |
| Zurich | Jan. 27-Feb. 2 | 1 | | |
| Syria: | | | | |
| Aleppo | Nov. 25-Dec. 1 | 1 | | In vicinity, at Djisr Choughour. |
| Damascus | Nov. 16-Dec. 15 | 7 | | |
| Tunis: | | | | |
| Tunis | Oct. 27-Nov. 2 | 5 | 1 | |
| Do | Jan. 8-Feb. 4 | 3 | 2 | |
| Turkey: | | | | |
| Constantinople | Nov. 11-Dec. 8 | 3 | | |
| Do | Jan. 6-12 | 1 | | |
| Union of South Africa | | | | Oct. 1-31, 1923: Colored, cases, 41; deaths, 2; white, cases, 3. |
| Cape Province | Oct. 28-Dec. 8 | | | Outbreaks. |
| Natal | Oct. 28-Nov. 3 | | | Do. |
| Northern Rhodesia | Dec. 4-31 | 40 | 5 | |
| Do | Jan. 8-14 | 2 | | |
| Orange Free State | Oct. 28-Nov. 24 | | | Do. |
| Transvaal | Nov. 18-Dec. 1 | | | Do. |
| Johannesburg | Nov. 25-Dec. 15 | 3 | | |
| Uruguay: | | | | |
| Montevideo | Oct. 1-31 | 1 | | |
| Venezuela: | | | | |
| Caracas | Jan. 22 | | | Epidemic. |
| On vessels: | | | | |
| S. S. Torres | Jan. 14 | 1 | | At New Orleans quarantine station from Tampico, Mexico, via ports. Case in seaman signed on at Galveston, Tex., on outward voyage. |
| S. S. Tupper | Jan. 20-26 | | | At Gonaives, Haiti. |
| S. S. Vasari | Dec. 31 | 1 | | At Trinidad, West Indies, from Buenos Aires, Argentina. Vessel left Buenos Aires Dec. 15, 1923, for New York, via Santos, Rio de Janeiro, Trinidad, Barbados. |

#### TYPHUS FEVER.

| | | | | |
|---|---|---|---|---|
| Algeria: | | | | |
| Algiers | Nov. 1-Dec. 31 | 7 | 3 | |
| Do | Jan. 11-20 | 1 | 1 | |
| Bolivia: | | | | |
| La Paz | Oct. 1-Dec. 31 | 43 | 5 | |
| Bulgaria: | | | | |
| Sofia | | | | Nov. 18-Dec. 15, 1923: Paratyphus fever; cases, 17. |
| Canary Islands: | | | | |
| Teneriffe | Jan. 14-20 | | 1 | |
| Chile: | | | | |
| Antofagasta | Dec. 2-8 | 4 | | |
| Concepcion | Oct. 1-Nov. 30 | | 4 | Dec. 11-24, 1923: Deaths, 3. |
| Do | Jan. 8-14 | | 2 | |
| Iquique | Jan. 20-26 | | 1 | |
| Talcahuano | | | | Dec. 5, 1923: 3 cases under treatment. Jan. 12, 1924: 1 case under treatment. |
| Do | Dec. 31-Jan. 6 | 1 | | |
| Valparaiso | Nov. 25-Dec. 15 | | 29 | Dec. 24, 1923: In hospital, 34 cases. |
| China: | | | | |
| Antung | Nov. 12-Dec. 30 | 5 | | |
| Chungking | Nov. 18-24 | | | Present. |
| Do | Dec. 16-29 | | | Endemic. |
| Do | Dec. 30-Jan. 12 | | | Do. |
| Ecuador: | | | | |
| Quito | Nov. 1-30 | 14 | 1 | |

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

### Reports Received from December 29, 1923, to March 7, 1924—Continued.

#### TYPHUS FEVER—Continued.

| Place. | Date. | Cases. | Deaths. | Remarks. |
|---|---|---|---|---|
| Egypt: | | | | |
| Alexandria | Nov. 19–Dec. 23 | 3 | | |
| Do | Jan. 8–14 | 1 | | |
| Cairo | Sept. 10–Dec. 9 | 35 | 10 | |
| Esthonia | | | | Nov. 1–30, 1923: Paratyphus fever: cases, 8. Dec. 1–31, 1923: Typhus fever, Cases, 15; Paratyphus: cases, 4. |
| Finland | | | | Dec. 1–15, 1923: Paratyphus fever; cases, 15. |
| Germany: | | | | |
| Coblenz | Jan. 27–Feb. 2 | 1 | | |
| Greece: | | | | |
| Saloniki | Nov. 26–Dec. 30 | 7 | 3 | |
| Hungary | | | | July 1–Aug. 31, 1923: Cases, 24. |
| Java: | | | | |
| East Java— | | | | |
| Soerabaya | Dec. 9–15 | 4 | | |
| Latvia | | | | Oct. 1–31, 1923: Cases, 12; paratyphus fever, 7; recurrent typhus, 3. Nov. 1–30, 1923: Cases, 1; paratyphus fever, 2 cases. Dec. 1–31, 1923: Cases, 9; paratyphus: Cases, 3. |
| Mexico: | | | | |
| Durango | Dec. 1–31 | | 2 | |
| Do | Jan. 1–31 | | 1 | |
| Mexico City | Nov. 25–Dec. 29 | 86 | | Including municipalities in Federal district. |
| Do | Dec. 30–Feb. 9 | 27 | | Do. |
| Norway: | | | | |
| Stavanger | Dec. 25–31 | 1 | | |
| Palestine: | | | | |
| Jaffa | Jan. 1–21 | 3 | | |
| Persia: | | | | |
| Teheran | Sept. 24–Oct. 23 | | 1 | |
| Poland | | | | Sept. 23–Dec. 8, 1923; Cases, 581; deaths, 49; recurrent typhus, cases, 49; deaths, 1. |
| Rumania: | | | | |
| Kishineff District | Nov. 1–Dec. 31 | 15 | | |
| Spain: | | | | |
| Barcelona | Nov. 29–Dec. 12 | | 2 | |
| Do | Jan. 3–23 | | 4 | |
| Madrid | Dec. 1–31 | | 7 | |
| Syria: | | | | |
| Damascus | Jan. 27–Feb. 2 | 1 | | |
| Turkey: | | | | |
| Constantinople | Nov. 11–Dec. 29 | 15 | 1 | |
| Do | Dec. 30–Jan. 19 | 5 | | |
| Union of South Africa | | | | Oct. 1–31, 1923: Colored, 287 cases, 58 deaths; white, 2 cases; total, 289 cases, 58 deaths. |
| Cape Province | | | | Oct. 1–31, 1923: Colored, cases, 245; deaths, 47. |
| Do | Oct. 28–Dec. 8 | | | Outbreaks. |
| Natal | | | | Oct. 1–31, 1923: Colored, cases, 4 deaths, 3. |
| Do | Oct. 28–Nov. 3 | | | Outbreaks. |
| Durban | Nov. 24–Dec. 1 | 73 | | Cases occurring among native stevedores in the harbor area of the port and confined to one barracks. |
| Orange Free State | | | | Oct. 1–31, 1923: Colored, cases, 25; deaths, 8. |
| Do | Dec. 15 | | | Outbreaks. |
| Transvaal | | | | Oct. 1–31, 1923: Colored, cases, 13. |
| Do | Oct. 28–Dec. 1 | | | Outbreaks. |
| Johannesburg | Oct. 1–Dec. 31 | 3 | 4 | |
| Do | Jan. 6–12 | 4 | | |
| Venezuela: | | | | |
| Maracaibo | Dec. 16–22 | | 1 | |
| Yugoslavia: | | | | |
| Croatia— | | | | |
| Zagreb | Dec. 2–15 | 3 | | |
| Serbia— | | | | |
| Belgrade | Nov. 25–Dec. 1 | 1 | | |

#### YELLOW FEVER.

| | | | | |
|---|---|---|---|---|
| Brazil: | | | | |
| Pernambuco City | Nov. 16 | 3 | 2 | |

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