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SIGNIFICANCE OF POSITIVE WASSERMANN AND KAHN REACTIONS IN LEPROSY[1]

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In dealing with leprosy one frequently is confronted with the question whether a given case has syphilis as a complication. The diagnosis of syphilis in nonlepers is not always simple, but in lepers it is in many instances extremely difficult. The history obtained in many cases is unreliable; and due to the similarity of some of the manifestations of the two diseases, the diagnosis on clinical findings alone may be impossible. What significance, then, can be placed upon the usual serological tests?

Cooke (1) (1919) summarized the work of 42 investigators, reporting from 1908 to 1916, on 1,397 cases of leprosy. Fifty and four-tenths per cent were reported as giving a positive Wassermann reaction. From the summary he concluded that positive Wassermann reactions may occur with the sera of lepers free from syphilis.

Hasseltine (2) (1924) summarized numerous reports on the subject covering the period from 1908 to 1919. He reviewed the reports on 214 cases not included in Cooke's summary. From his review he believed there was ample foundation for the assumption that serum from cases of leprosy may give a positive Wassermann reaction even though syphilis is absent.

A review of the more recent literature on the subject shows that there is still a marked disagreement in the results obtained and the conclusions arrived at by various investigators.

Iyengar (3) (1919) reported the Wassermann test to be positive in 41 per cent of 100 undoubted male lepers from 25 to 60 years of age and 22 per cent of 400 unselected Indian males of the same ages not suffering from leprosy.

Lie (4) (1920) found the Wassermann test to be positive in most cases of nodular leprosy and in some cases of the anesthetic type.

Goodpasture (5) (1923) obtained a positive Wassermann test in 60 per cent of untreated cases of nodular and mixed leprosy.

Lloyd, Muir, and Mitra (6) (1923) found 41.7 per cent of 228 adult lepers and 62 per cent of 58 leper children to give positive Wassermann tests.

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Leao (7) (1923) obtained positive results in 50 per cent of his cases tested with an antigen of luetic liver; 32 per cent with cholesterinized human and ox-heart antigens, and 14 per cent with an acetone insoluble antigen.

Yagle and Kolmer (8) (1923) tested the sera of 28 cases of leprosy. From the results obtained they concluded that the Kahn precipitation reaction is uniformly negative with the sera of nonsyphilitic lepers.

Kolmer and Denney (9) (1923) examined the sera of 159 cases of leprosy and concluded that "In so far as the new complement fixation reaction is concerned, we have no hesitation in stating that in leprosy itself falsely positive reactions do not occur."

Lewis and Aronson (10) (1923) examined the sera of 44 cases of leprosy and 134 nonlepers. With a cholesterinated antigen they obtained 55.9 per cent of the former and 24.3 per cent of the latter positive; with an acetone insoluble antigen they found the percentages of positives to be 63.6 and 18.7 respectively. They tested the complement fixing power of serum of lepers and nonlepers with an alcoholic extract of *Bacillus tuberculosis* as an antigen; 93.3 per cent of 44 lepers and 68.4 per cent of 134 nonlepers gave positive results. In a previous study (11), using the same antigen they obtained but 71 per cent of positive reactions in frank cases of tuberculosis. They conclude that since sera of lepers give such a high percentage of positive reactions with antigens ordinarily used for the Wassermann reaction and with the tuberculosis antigen these reactions can not be interpreted as being indicative of a superimposed or underlying infection with syphilis or tuberculosis.

Lloyd, Muir, and Mitra (12) (1924) concluded from their investigation that syphilis is an important complicating factor in both types of leprosy.

Hasseltine (2) (1924) testing the sera of 236 lepers obtained positive results in 17.8 per cent with an acetone insoluble antigen; 50 per cent with cholesterinated antigen and 21.6 per cent with Kolmer's antigen. He concluded that there is apparently a tendency to the formation of some reagin in the sera of lepers that will fix complement in the presence of the usual Wassermann antigens.

Sechi (13) (1925) found the Wassermann test positive in 10 of 11 sera of lepers tested.

Simon (14) (1925) tested the sera of 24 cases of leprosy by the Wassermann test and found 23 positive, 15 strongly so. He concluded that the Wassermann reaction is positive in leprosy.

Pineda and Roxas-Pineda (15) (1926) after testing 500 cases of leprosy concluded substantially as follows: (1) With refined methods the Wassermann reaction is negative in uncomplicated cases of leprosy in its ordinary form. (2) When the Wassermann reaction is clearly

positive in cases of ordinary leprosy it has the same significance as in nonlepers. (3) In a certain proportion of cases of leprosy reactions without evidence or presumption of syphilis, weakly positive reactions are obtained.

Arguilles (16) (1926) found a very close agreement in the Wassermann and Kahn tests, with the latter slightly more sensitive. He stated that the Wassermann and Kahn tests in leprosy are generally negative.

Pineda and Roxas-Pineda (17) (1926) after the examination of 222 cases of leprosy concluded that the Kahn test is negative in uncomplicated leprosy and gives no doubtfully positive reactions in cases suffering from leprous reactions.

Lloyd, Muir, and Mitra (18) (1926) found 31.2 per cent of 1,027 cases of leprosy to give positive Wassermann reactions. They found 50 per cent of 28 leper children, 48.5 per cent of 249 (majority advanced skin leprosy) and 25 per cent of 754 mild cases to give positive Wassermann tests.

Otero (19) (1927) after testing the sera of 42 lepers with the Wassermann, Kolmer, and Kahn tests, concluded that some uncomplicated cases of leprosy do give positive reactions, especially during febrile reactions.

Vilanova and Catories (20) (1927) concluded from their studies that sera of leper patients possess the power of fixing complement in the presence of various antigens.

Girard and Robie (21) (1928) concluded that the Meinicke test gave positive reactions in a certain number of syphilis-free lepers.

Lai (22) (1928) after testing the sera of 167 lepers, concluded that "The Kahn reaction is generally negative in leprosy without the coexistence of syphilis."

Greval (23) (1928) found the Kahn, Micro-Kahn, and the Wassermann tests with the sera of 112 lepers and an equal number of syphilitic suspects to give almost identical results in the two series of cases.

Silveria and Gomes (24) (1929) obtained positive Wassermann and Kahn reactions in patients showing, clinically, signs of leprosy without those of other diseases such as syphilis.

From the above summaries one may conclude that the results of most of the studies indicate that there is a reagin in the sera of some lepers that will fix complement in the presence of the Wassermann and Kahn antigens.

PRESENT OBSERVATIONS

There frequently occur positive reactions with the sera of patients under treatment for leprosy at Kalihi Hospital in whose history there is no indication of syphilis nor are there noted clinical findings of that disease.

The present study was undertaken to obtain, if possible, further evidence as to the significance of positive serum reactions in leprosy. The Wassermann [2] and Kahn [2] tests are made with the sera of all patients entering the hospital, and this report is based on the findings of these tests with the sera of 207 patients over 10 years of age.

The antigens employed were Kolmer's antigen for the Wassermann tests and Kahn's antigen for the Kahn test. A reading of three plus or more with 0.1 or 0.05 cubic centimeters of serum was considered a positive Wassermann test, and an average of three plus with 0.05, 0.025, and 0.0125 cubic centimeters of the antigen a positive Kahn test.

A positive Wassermann test was observed with the sera of 42, or 20.2 per cent; a positive Kahn test with the sera of 57, or 27.5 per cent, and one or both tests were found positive with the sera of 60, or 28.9 per cent.

There occur, as will be discussed later, changes in the results of the tests during the course of the disease. With the tests repeated one to three times on but 56 of the 207 patients, the percentage of patients whose sera gave positive reactions at one or more tests increased from 28.9 per cent to 34.8 per cent. None of the cases retested had received antisyphilitic therapy in any form.

TABLE 1.—*The age and sex incidence of persons having either positive Wassermann or Kahn reactions, or both, among 207 lepers studied*

Age group	Male			Female			Total		
	Number examined	Number positive	Per cent positive	Number examined	Number positive	Per cent positive	Number examined	Number positive	Per cent positive
10-19	33	10	30.3	25	11	44.0	58	21	36.2
20-29	44	11	25.0	23	9	39.1	67	20	29.8
30-39	27	4	14.8	12	6	50.0	39	10	25.6
40+	30	6	20.0	13	3	23.0	43	9	20.9
Total	134	31	23.1	73	29	39.7	207	60	28.9
10-19	33	10	30.3	25	11	44.0	58	21	36.2
20+	101	21	20.7	48	18	37.5	149	39	26.1

TABLE 2.—*The age and sex incidence of persons having positive Wassermann reactions, and of those having a positive Kahn reaction, among 207 lepers studied*

Age group	Male					Female					Total				
	Wassermann			Kahn		Wassermann			Kahn		Wassermann			Kahn	
	Number examined	Number positive	Per cent positive	Number positive	Per cent positive	Number examined	Number positive	Per cent positive	Number positive	Per cent positive	Number examined	Number positive	Per cent positive	Number positive	Per cent positive
10-19	33	6	18.1	8	24.2	25	8	32.0	8	32.0	58	14	24.1	16	27.5
20-29	44	5	11.3	11	25.0	23	9	39.1	11	47.8	67	14	20.8	22	32.8
30-39	27	2	7.4	4	14.8	12	3	25.0	6	50.0	39	5	12.8	10	25.6
40+	30	6	20.0	6	20.0	13	3	23.0	3	23.0	43	9	20.9	9	20.9
Total	134	19	14.1	29	21.6	73	23	31.5	28	38.3	207	42	20.2	57	27.5

[2] The Wassermann and Kahn tests were performed in the laboratory of the Queens Hospital, Honolulu.

In studying the relation of these tests to sex it will be observed (Tables 1 and 2) that positive results were obtained nearly twice as frequently in the females as in the males. Positive tests occurred in 39.7 per cent of the females and 23.1 per cent of the males. The same variation between the sexes is also noted when each test is considered separately, and with the exception of the patients over 40 years of age the variation is noted in each of the age groups.

It will also be noted from the study of Tables 1 and 2 that positive reactions occur more frequently in the patients under 20 than in those over 20 years of age, the percentage being 36.2 and 26.1, respectively. The lowest incidence falls in the age group 40 years or over and the highest in the 10 to 20 age group.

A study of these tests in relation to the types of leprosy was attempted. Such a study is difficult, since we have at our command no satisfactory classification of leprosy, as to types. It is rare, if ever, in Hawaii at least, that one sees a case of leprosy which does not show both neural and dermal manifestations. For the purpose of this study those cases in which the dermal manifestations predominate are classed as dermal and those in which the predominating manifestations are the result of nerve involvement are classed as neural. No variation in the serum reactions in the two classes was noted.

Likewise no variation was noted when the cases were classified by microscopic examination as positive and negative.

A comparison of these results with those of a recent analysis made at a local general hospital showed positive Wassermann and Kahn tests to be approximately three times as frequent among lepers as among nonlepers. One hundred and twenty-one, or 9.9 per cent, of the sera of 1,212 hospital cases, not including any cases of leprosy, gave positive reactions, in contrast with 60, or 28.9 per cent, of the sera of 207 cases of leprosy.

Either a positive Wassermann or a positive Kahn test with the sera of lepers has been regarded by some observers as signifying the presence of a syphilitic infection. If this were correct, there should occur a close agreement in the two tests. In the initial determinations with the sera of the 207 patients, both tests were negative in 146 and positive in 40, an agreement of 89.8 per cent and a disagreement of 10.1 per cent. However, a further analysis of the results shows that 31 per cent of the sera that gave a positive Kahn reaction gave a negative Wassermann reaction—a rather marked disagreement.

Although an incidence of syphilis of 34.8 per cent is considered high, it may be argued that, as leprosy most frequently occurs among individuals of a low social and economic status, the incidence of syphilis in such a group would also be high. As stated above, the results of this study have been compared with the results of a

group of patients in a general hospital. Both groups are comparable in social and economic status, as well as in racial origin. The tests on both groups were performed by the same laboratorian employing the same antigens and technique. The incidence of positive serum reaction in the leper group was found to be more than three times that in the control group.

If a positive Wassermann or Kahn test obtained with the sera of lepers signifies the presence of an infection with the *Treponema pallidum*, then one may conclude that—

1. One in three of the patients studied is afflicted with both leprosy and syphilis;
2. Syphilis occurs three times as frequently in the leper group as in the control group;
3. Syphilis occurs almost twice as frequently among the female as among the male patients; and
4. The incidence of syphilis is greater in the patients under than in those over 20 years of age.

Experience with syphilis renders such conclusions highly improbable, and one is forced to interpret these observations as suggesting that a positive Wassermann or a positive Kahn reaction does not necessarily signify the presence of a complicating syphilitic infection.

If a positive serum reaction is produced by some reagin in the serum of individuals with leprosy other than those, whatever their nature, in the serum of syphilitics, evidence of such should be obtained by withholding antisyphilitic therapy and observing the changes in the clinical manifestations of the leprosy and retesting the serum at intervals. Such a procedure has been followed in this study.

Definite changes have been noted in the serum reactions accompanying alterations in the clinical manifestations of leprosy when the sera have been retested after intervals of varying length. These changes occurred in both the Wassermann and Kahn tests and consisted of a negative serum becoming positive, a positive serum becoming negative, or by either an increase or a decrease in the degree of reaction. The changes in the two tests were not always comparable, as shown by the fact that Wassermann tests have become negative or decreased in degree, while the Kahn reaction remains unchanged. In some instances both decreased in degree or became negative, and in others the clinical changes were accompanied by an increase in the degree of the Kahn, even to a strongly positive, while the Wassermann remained negative. In others clinical changes were accompanied by an increase in the reaction of both tests. In no instance did there occur an increase in the degree of the Wassermann without an increase in the Kahn, except in those cases where the Kahn was four plus at the previous test.

The changes noted in the serum reactions are tabulated in Tables 3, 4, 5, and 6. A few of the cases are described in more detail.

TABLE 3.—*The results of the retesting of sera which gave a positive Wassermann reaction on the first test (no antisyphilitic therapy)*

Case	Date	Wassermann reaction—Amount of serum		Remarks
		0.1 c.c.	0.05 c.c.	
2748	July, 1927	1	3	On admission.
	September, 1928	0	0	Marked improvement following reaction.
	June, 1929	0	0	Continued improvement.
2828	April, 1928	2	3	On admission.
	January, 1929	1	3	Definite improvement.
	April, 1929	0	0	Slow but continued improvement.
	July, 1929	0	0	Do.
2857	August, 1928	4	4	On admission.
	January, 1929	2	3	Slow but definite improvement.
	July, 1929	2	2	Continued improvement.
2838	August, 1928	1	3	Three months after admission.
	February, 1929	0	0	Marked improvement.
	July, 1929	0	0	Continued slow improvement.
2837	July, 1928	4	4	On admission.
	October, 1928	1	1	Marked improvement.
	March, 1929	1	2	Stationary.
	July, 1929	3	4	Do.
2598	November, 1925	4	4	On admisssion.
	August, 1928	0	0	Clinically quiescent.
	July, 1929	0	0	Do.
2827	May, 1928	4	4	On admission.
	October, 1928	0	0	Marked improvement.
	July, 1929	0	0	Clinically quiescent.
2830	April, 1928	4	4	On admission.
	February, 1929	3	4	Slight improvement.
	July, 1929	2	2	Definite improvement following reaction.

TABLE 4.—*The results of retesting of sera which gave a negative Wassermann reaction on the first test*

Case	Date	Wassermann reaction—Amount of serum		Remarks
		0.1 c.c.	0.05 c.c.	
2875	October, 1928	0	0	On admission.
	January, 1929	0	3	Sub-acute reaction.
	June, 1929	3	4	Acute leprous reaction.
2245	February, 1923	0	0	On admission.
	August, 1928	0	0	Moderate nodulation.
	March, 1929	0	0	Increased nodulation.
	July, 1929	1	3	Marked nodulation.
2755	September, 1927	0	0	Quiescent.
	March, 1929	2	1	During reaction.
	July, 1929	2	0	Convalescing from reaction.
2116	August, 1923	0	0	Slight nodular involvement.
	April, 1924	0	0	Do.
	August, 1928	1	3	Marked and heavy nodulation.
	July, 1929	3	4	Marked and heavy nodulation and colliquation.
2850	August, 1928	0	0	On admission.
	February, 1929	4	3	Slight improvement.
	July, 1929	3	3	Marked decrease in infiltration.
2852	August, 1928	0	0	On admission.
	January, 1929	0	2	Slight improvement.
	July, 1929	3	4	Marked decrease in infiltration.
2874	October, 1928	0	1	On admission.
	January, 1929	3	4	Definite decrease in infiltration.
	July, 1929	3	3	Marked decrease in infiltration since admission.

TABLE 5.—*The results of retesting sera which gave a positive Kahn reaction on the first examination (no antisyphilitic therapy)*

Case	Date	Kahn reaction—Dilutions of antigen			Remarks
		0.05 c.c.	0.025 c.c.	0.0125 c.c.	
2748	July, 1927	3	3	3	On admission.
	September, 1928	0	0	0	Marked improvement following reaction.
	June, 1929	4	4	4	Slow steady retrogression; developing new hard papular lesions.
2855	August, 1928	3	3	3	On admission.
	January, 1929	1	1	1	Marked improvement.
	July, 1929	0	0	0	Slow but continued improvement.
2874	October, 1928	3	3	4	On admission.
	January, 1929	2	2	3	Definite decrease in infiltration.
	July, 1929	1	2	3	Marked decrease in infiltration since admission.
2827	May, 1928	4	4	4	On admission.
	October, 1928	0	0	0	Marked improvement; skin quiescent; paroled July, 1929.

TABLE 6.—*The results of retesting of sera which gave negative Kahn reactions on the first examination*

Case	Date	Kahn reaction—Dilutions of antigen			Remarks
		0.05 c.c.	0.025 c.c.	0.0125 c.c.	
2712	March, 1927	0	0	0	On admission.
	June, 1929	0	1	3	During acute leprous reaction.
2749	July, 1927	0	0	0	On admission.
	November, 1927	0	0	0	Clinically stationary.
	July, 1929	1	3	3	Marked retrogression; became markedly nodular.
2875	October, 1928	1	2	3	On admission.
	July, 1929	4	4	4	During acute reaction.
2831	May, 1928	0	0	0	On admission.
	September, 1928	0	0	0	Definite improvement since admission.
	February, 1929	2	3	4	Reactivation of lesions; leprous reaction.
	July, 1929	0	0	0	No active lesions.
2829	April, 1928	0	0	0	On admission.
	February, 1929	2	2	4	Slow but definite retrogression.
	July, 1929	2	3	4	Marked increase in nodulation since admission.
2116	August, 1923	0	0	0	Slight nodulation.
	April, 1924	0	0	0	Do.
	August, 1928	4	4	4	Marked nodulation.
	February, 1929	4	4	4	Marked nodulation; nodules breaking down and ulcerating.
	July, 1929	4	4	4	Marked nodulation; nodules breaking down and ulcerating.
2505	August, 1928	1	2	4	Admitted February, 1925; progressed since admission.
	July, 1929	2	3	4	Marked increase in infiltration.
2793	November, 1927	1	1	1	On admission.
	September, 1928	1	2	3	Nodules breaking down and ulcerating.
	February, 1929	3	3	4	Marked breaking down and ulceration of lesions.
	July, 1929	3	3	4	Do.

CASE REPORTS

Case 2598 (Table 3).—On admission: Erythematous infiltration of ears, face, neck, and legs; erythematous macules over the buttocks and thighs. Hands and feet edematous and cyanotic. Soon after admission, Wassermann four plus. Three years later: Clinically quiescent, Wassermann negative. Four years after admission: Clinically quiescent, Wassermann negative. (Change: From strongly positive to negative Wassermann.)

Case 2827 (Tables 3 and 5).—On admission: Erythematous edematous macules over face, arms, hands, trunk, buttocks, and legs. Wassermann and Kahn positive. After 5 months, marked improvement, but slight erythema and no edema of lesions; Wassermann and Kahn negative. Fourteen months after admission: Clinically arrested; paroled; Wassermann and Kahn negative. (Change: From strongly positive to negative Wassermann and Kahn.)

Case 2828 (Table 3).—On admission: Marked infiltration of entire face and ears, cheeks and ears nodular; upper and lower extremities infiltrated and nodular; edema and cyanosis of hands and feet; Wassermann 2 and 3 plus; Kahn 4 plus. After 9 months of moderate improvement: Wassermann 1 and 3 plus, Kahn 4 plus. After 12 months of steady moderate improvement: Wassermann negative, Kahn 4 plus. After 15 months of steady improvement: Wassermann negative, Kahn 4 plus. (Change: From weakly positive Wassermann and strongly positive Kahn to weaker Wassermann and strongly positive Kahn, to negative Wassermann and strongly positive Kahn.)

Case 2875 (Tables 4 and 6).—On admission: Bacteriologically positive, nodulation and infiltration of ears, face, and extremities; marked edema and cyanosis of hands and feet; Wassermann negative, Kahn weakly positive. Three months after admission, during a subacute reaction: Wassermann and Kahn both weakly positive. Eight months after admission, during "acute leprous fever": Wassermann and Kahn strongly positive. (Change: From negative Wassermann and weakly positive Kahn to weakly positive Wassermann and Kahn to strongly positive Wassermann and Kahn.)

Case 2855 (Table 5).—On admission: Marked erythematous infiltration and nodulation of ears, face, neck, trunk, and extremities; hands and feet edematous and cyanotic; Wassermann negative, Kahn positive. After 5 months of marked improvement: Wassermann negative and Kahn 1 plus. After 5 months of marked improvement and 7 months of continued steady improvement: Wassermann and Kahn negative. (Change: From negative Wassermann and positive Kahn to negative Wassermann and Kahn.)

Case 2829 (Table 6).—On admission: Marked erythematous infiltration and nodulation of ears, face, and extremities; Wassermann and Kahn negative. After 15 months of steady retrogression: Wassermann negative, Kahn positive. (Change: From negative Wassermann and Kahn to negative Wassermann and positive Kahn.)

There were noted changes in the serum reaction which suggest that there occur, in some cases, substances in the serum resulting from marked and rapid degeneration of the lesions of leprosy which produce positive serum tests.

Case 2116 (Tables 4 and 6).—On admission: Age, 6 years; moderate nodulation of ears, face, and extremities; Wassermann and Kahn negative. At age of 12: Marked nodulation and some degeneration of lesions; Wassermann, 1 and 3 plus. Eleven months later: Marked nodulation and degeneration; Wassermann, 3 and 4 plus; Kahn, 4 plus. (Change: From negative Wassermann and Kahn to strongly positive Wassermann and Kahn.)

Case 2793 (Table 6).—On admission: Marked nodulation; severe edema of legs and feet; moderate ulceration of feet. After 5 months: Some improvement and increase in degeneration and ulceration of lesions. (Change: Increase in degree of Kahn reaction.)

From a study of the tables and the foregoing case reports it will be seen that definite changes in the clinical manifestations of leprosy may be accompanied by correlated changes in the serum reactions. A marked clinical improvement in a patient whose serum gives a positive serological test may be accompanied by a change from a posi-

tive to a negative serum reaction. A slow but steady clinical improvement may be accompanied by a gradual diminution in the degree of the serum reaction before it becomes negative. Subacute or acute leprous reactions may be accompanied by changes in the serum reactions from negative to weakly or strongly positive. There also may occur a change from negative to a positive reaction with the sera of patients whose lesions are undergoing rapid and extensive degeneration (ulceration or colliquation). In cases where there occurs a fluctuation clinically, the degree of serum reactions may also fluctuate.

The Wassermann test has been performed with the sera of 220[a] lepers, 42 of which resulted in positive and 178 in negative readings. Retesting of 18 of the positives who had received no antisyphilitic therapy and 23 of the negatives resulted in changes in the reaction in 16, or 39 per cent. Of the positive sera, 9, or 50 per cent, showed changes in the degree of reaction, 5, or 26.6 per cent, becoming negative. Of the negative sera, 7, or 30.4 per cent, showed changes in the degree of reaction, 5, or 21.7 per cent, becoming positive.

The Kahn test was performed on 207 lepers, 57 of which resulted in positive and 150 in negative readings. Retesting of 25 of the positives and 16 of the negatives who had received no antisyphilitic therapy resulted in changes in 19, or 46.3 per cent. Eight, or 32 per cent, of the positives and 11, or 68.7 per cent, of the negatives showed changes in degree of reaction, 6, or 37.5 per cent, of the negatives becoming positive. The Kahn test is apparently more sensitive with the sera of lepers than is the Wassermann. A higher percentage of the sera gave a positive Kahn reaction, and clinical changes are more frequently accompanied by changes in the Kahn than in the Wassermann tests.

THE QUANTITATIVE KAHN TEST

A quantitative Kahn test was determined on 33 leprosy patients whose sera gave a strongly positive Kahn reaction. In a total of 52 determinations the number of units varied from 4 to 20,000, with 32, or 61.5 per cent, over 1,000. In the local general hospital, where similar determinations were made by the same laboratorian, it was rare to find a reading of over 1,000 units. The hospital cases may be used as a control. A comparison of the two groups suggests that the sera of lepers giving a strongly positive Kahn reaction may contain an unusually high number of Kahn units.

By determination of the number of Kahn units at intervals of varying duration, a relation of the results with the clinical progress of the leprosy was noted. There occurred a reduction in the number of units with clinical improvement and an increase with clinical retrogression. None of the patients retested had received anti-

[a] Including 13 cases on whose sera the Kahn test was not performed.

syphilitic therapy in any form. The results of the quantitative Kahn determinations are tabulated in Table 7.

TABLE 7.—*Results of quantitative Kahn determinations*

Case	Date	Kahn units	Remarks
2879		4	
2755		4	
2887		40	
2899		40	
2869		40	
2864		110	
2867		200	
2905		280	
2910		400	
2904		400	
2900		800	
2924		800	
2920		2,000	
2839		2,000	
2738		4,000	
2929		4,000	
2889		6,400	
2893	February, 1929	10,000	On admission.
	June, 1929	4,000	Definite improvement.
2828	January, 1929	3,960	Nodular.
	July, 1929	4,000	No change since previous test.
2857	January, 1929	7,600	Nodular.
	July, 1929	2,000	Marked improvement during 6 months.
2245	March, 1929	2,000	Nodular.
	July, 1929	1,600	Stationary clinically.
2863	January, 1929	480	Nodular; marked improvement over 5 months' period.
	March, 1929	400	Stationary.
	July, 1929	2,800	Retrogression, new lesions.
2858	January, 1929	9,600	Marked edema; moderate infiltration.
	July, 1929	10,000	Stationary to improvement.
2838	February, 1929	8,400	Nodular; definite improvement over 9 months.
	July, 1929	2,000	Marked improvement.
2837	March, 1929	2,000	Nodular; improvement over 10 months.
	July, 1929	2,800	Stationary.
2884	January, 1929	840	On admission, nodular.
	July, 1929	3,600	No improvement.
2888	February, 1929	12,000	On admission, marked infiltration and edema.
	March, 1929	8,400	Definite improvement.
	July, 1929	3,600	Marked improvement since admission.
2891	February, 1929	1,800	On admission, heavy nodular.
	July, 1929	1,200	Slight improvement.
2850	February, 1929	1,500	Nodular, heavy.
	July, 1929	800	Definite improvement.
2852	January, 1929	2,500	Nodular.
	July, 1929	2,400	Slight improvement.
2830	February, 1929	1,400	Nodular.
	July, 1929	800	Definite improvement following reaction.
2982	March, 1929	40	Nodular improving.
	July, 1929	40	Do.
2116	February, 1929	12,000	Nodules, breaking down and ulcerating.
	July, 1929	20,000	Ulceration more marked.

A study of Table 8 and the following case reports will show changes in the Wassermann, Kahn, and quantitative Kahn similar to those expected in treated and untreated cases of syphilis, although none of the cases had received antisyphilitic therapy.

TABLE 8.—*The relationship of the Wassermann and Kahn reactions and the number of Kahn units to the clinical progress of leprosy*

Case	Date	Wassermann		Kahn			Kahn units	Remarks
		0.1 c. c.	0.05 c. c.	0.05 c. c.	0.025 c. c.	0.0125 c. c.		
2893	February, 1929	3	4	4	4	4	10,000	
	June, 1929	3	4	4	4	4	4,000	Definite improvement.
2857	August, 1928	4	4	4	4	4		
	January, 1929	2	3	4	4	4	7,600	Slow but definite improvement.
	July, 1929	2	2	4	4	4	2,000	Continued improvement.
2838	August, 1928	1	3	4	4	4		
	February, 1929	0	0	4	4	4	8,400	Definite improvement.
	July, 1929	0	0	4	4	4	2,000	Continued improvement.
2888	February, 1929	3	4	4	4	4	12,000	
	July, 1929	3	3	4	4	4	3,600	Marked improvement.
2891	February, 1929	4	4	4	4	4	1,800	
	July, 1929	4	4	4	4	4	1,200	Slight improvement.
2830	April, 1928	4	4	4	4	4		
	February, 1929	3	4	4	4	4	1,400	Stationary.
	July, 1929	2	2	4	4	4	800	Marked improvement, following a reaction.
2850	February, 1929	4	3	4	4	4	1,500	
	July, 1929	3	3	4	4	4	800	Definite improvement.
2863	August, 1928	4	4	4	4	4		
	January, 1929	4	4	4	4	4	480	Improving.
	March, 1929	4	4	4	4	4	400	Do.
	July, 1929	4	4	4	4	4	2,800	Reaction.
2837	July, 1928	4	4	4	4	4		
	October, 1928	1	1	4	4	4		
	March, 1929	1	2	4	4	4	2,000	Improving.
	July, 1929	3	4	4	4	4	2,800	Stationary.
2884	January, 1929	2	2	4	4	4	840	On admission.
	July, 1929	3	4	4	4	4	3,600	No clinical change noted.
2116	August, 1923	0	0	0	0	0		
	April, 1924	0	0	0	0	0		
	August, 1928	1	3	4	4	4		
	February, 1929	------	2	4	4	4	12,000	Marked nodulation, ulceration; breaking down of nodules.
	July, 1929	3	4	4	4	4	20,000	Ulceration and colliquation increased.

Case 2893.—On admission: Heavy nodulation and infiltration of ears, face, and extremities; marked edema and cyanosis of hands and feet; Wassermann 3, 4; Kahn 4, 4, 4; quantitative Kahn 10,000. After 4 months of slight clinical improvement: decrease in infiltration, desquamation of lesions of legs; Wassermann and Kahn unchanged, quantitative Kahn 4,000.

Case 2857.—On admission: Moderate nodulation and infiltration of ears, face, and extremities; marked edema and cyanosis of hands and feet. Wassermann 4, 4; Kahn 4, 4, 4. No quantitative Kahn made. After 5 months of slow steady improvement: Wassermann 2, 3; Kahn 4, 4, 4; quantitative Kahn 7,600. Six months more of slow definite improvement: Wassermann 2, 2; Kahn 4, 4, 4; quantitative Kahn, 2,000.

Case 2838.—On admission: Moderate nodulation of ears, face, and extremities; marked edema of hands and feet; Wassermann 1, 3; Kahn 4, 4, 4; quantitative Kahn not determined. After 6 months of definite improvement: Wassermann, negative; Kahn 4, 4, 4; quantitative Kahn 8,400; after 5 months of continued improvement: Wassermann negative; Kahn 4, 4, 4; quantitative Kahn 2,000.

Case 2888.—On admission: Advanced nodular, heavy infiltration of ears, face, trunk, and extremities; marked edema and cyanosis of hands and feet; Wassermann 3, 4; Kahn 4, 4, 4; quantitative Kahn 12,000; after 5 months marked improvement though still marked infiltration; severe keratitis cleared; edema and cyanosis of feet much improved; Wassermann and Kahn unchanged; quantitative Kahn from 12,000 to 3,600.

Case 2891.—On admission: Heavy infiltration of ears and face; Wassermann 4, 4; Kahn 4, 4, 4; quantitative Kahn 1,800; after 5 months of slight improvement: Wassermann 4, 4; Kahn 4, 4, 4; quantitative Kahn 1,200.

Case 2830.—On admission: Advanced infiltrated leprosy; Wassermann 4, 4; Kahn 4, 4, 4; no quantitative Kahn determined. After 10 months of no evident clinical change: Wassermann 3, 4; Kahn 4, 4, 4; quantitative Kahn 1,400. Definite improvement following acute reaction; Wassermann 2, 2; Kahn 4, 4, 4; quantitative Kahn 800.

Case 2850.—On admission: Advanced nodular; Wasserman 4, 3; Kahn 4, 4, 4; quantitative Kahn 1,500; after 5 months of slight clinical improvement: Wassermann 3, 3; Kahn 4, 4, 4; quantitative Kahn 800.

Case 2863.—On admission: Advanced nodular; Wassermann 4, 4; Kahn 4, 4, 4; quantitative Kahn not determined. After 7 months of slight improvement: Wassermann 4, 4; Kahn 4, 4, 4; quantitative Kahn 400. Nine months after admission: Increased erythema of existing lesions and appearance of new lesions; Wassermann 4, 4; Kahn 4, 4, 4; quantitative Kahn 2,800.

Case 2116.—Admitted 5 years before this study was begun. On admission: Moderate nodular; Wassermann and Kahn negative. Five years later: Extremely nodular with some degeneration of lesions; Wassermann 1, 3; Kahn 4, 4, 4; no quantitative Kahn determined. Six months later: Marked degeneration and ulceration of lesions; Wassermann 0, 2; Kahn 4, 4, 4; quantitative Kahn 12,000. Five months later: Marked increase in degeneration and ulceration; Wassermann 3, 4; Kahn 4, 4, 4; quantitative Kahn 20,000.

This study of the quantitative Kahn determinations on a small group of lepers reveals changes in the number of units correlated with clinical changes in the leprosy.

The results of the Wassermann and Kahn tests and the quantitative Kahn are variable during the course of the disease. Variations occur with the sera of patients who have received no antisyphilitic therapy. They bear a definite relation to changes in clinical manifestations of the leprosy. It is believed, therefore, that this study shows further evidence that a positive Wassermann or a positive Kahn test with the sera of lepers does not necessarily signify the presence of a syphilitic infection.

SUMMARY

1. There occurred an abnormally high incidence of positive serum reactions in the cases studied.

2. The positive reactions occurred nearly twice as frequently among the females as the males.

3. The positive reactions were more frequent among the patients under than those over 20 hears of age.

4. Positive reactions were three times as frequent among the lepers as among a control group.

5. Definite changes in the serum reactions correlated with changes in the clinical manifestations of the leprosy were observed.

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THE COUNTY HEALTH UNIT OF YESTERDAY AND TO-DAY[1]

By Fred T. Foard, *Acting Assistant Surgeon, United States Public Health Service*

Since the first full-time county health unit was organized in Yakima County, Wash., in 1911, many changes have been made in the plan of conduct of county health programs. Where the public health dollar formerly purchased only environmental sanitation, it is now also being spent for immunization against typhoid fever, diphtheria, smallpox, and scarlet fever, and for the purchase of immune sera in the treatment of poliomyelitis and other diseases. Oral and mental hygiene have been included in many public health programs as routine procedures, while child hygiene has rightly come into its own to claim a large portion of the time and efforts of the personnel.

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Nutritional and prenatal clinics, measures for the prevention of tuberculosis, pellagra, rickets, hookworm infestation, Rocky Mountain spotted fever, tularæmia, malaria, and many other preventable or controllable diseases, including food poisoning, have come to be definite responsibilities of those who are engaged in public health work. Where a few hundreds of dollars were formerly, and sometimes reluctantly, provided by public officials for manning the one- or two-person county health departments of 19 years ago, thousands of dollars are now appropriated in many instances for employing experienced personnel trained in the field of disease prevention. The full-time county health unit plan has passed through the period of skepticism and doubt, when the soundness of its principles was questioned by business men and it was looked upon as a fad by the uninformed general public. It has at last come to be considered an absolute necessity for every progressive rural community and is recognized as a sound business enterprise which, when conducted properly, will pay greater dividends on the capital invested than any other investment to which the public may subscribe.

We have arrived at the time when it is much easier to obtain necessary funds for establishing county health units than it is to provide them with experienced personnel, and we must soon turn our attention to the intensive training of public health executives and to familiarizing ourselves better, as public health officials, with the wider viewpoints of the public health field. There is no movement of the present day which offers greater opportunity at the top than does public health. While some of our leading universities are including public health courses as a part of their standard curricula, we are still faced with the necessity of relying to too great an extent upon the school of practical experience to furnish our public health officials. One can scarcely overemphasize the importance of annual or semiannual assemblages of county and State health workers, where information obtained at round-table discussions will later result in greater accomplishments in widespread communities.

Formerly county health programs were conducted under the "trial and error method"; but we are now coming to follow very definite and clear-cut lines of procedure. The policy of the health officer of to-day, whether he be local, State, or Federal, is a common policy with a definite objective in view; and while conditions may vary widely in different sections of a State, or in different States, all are working toward a common end. Teamwork is necessary, however, between public health officials, and with the State as a unit, the monthly or semimonthly news letter, edited by the State department of health and circulated among all of its public health workers, is a very effective method of familiarizing every community with the procedures of public health workers in other communities.

Leadership is an important attribute of the public health official who is to be successful in his community. He should therefore make every effort to secure the active participation and cooperation of those organizations which can help him most in his community program and without which his work can not be an outstanding success. He should have the support and cooperation of the organized medical profession. The progressive private practitioner, whether he be family physician in general practice or highly trained specialist, should be considered his greatest friend and ally in the public health program. The health officer should also have the cooperation of boards of education and of unofficial voluntary agencies which are interested or engaged in public health work. This can frequently be obtained through advisory committees composed of representatives of the different groups which are interested in various phases of the program. These committees should function in addition to the usual official board of health. When such cooperation has been obtained, it is necessary for the health officer to exhibit qualities of statesmanship in order that he may have the worthy suggestions offered by advisory committees approved by his board of health. It is only through such coordination of effort that the most effective educational programs can be carried out, and it is only through educational work that the desired results may be obtained.

The health officer must also be a student of public-health policies, as it is only through his familiarity with the most approved policies in health protection and promotion that he can assume the rôle of Kipling's Sir Anthony Gloucester who, as a secret of his success and leadership, said: "I give them the scripture text, I keep my light so shining a little ahead of the next."

While conditions and practices may vary widely in different localities, there are certain phases of public health work which are of equal importance to all health officers, no matter how widely they are separated geographically. One of the most important of these is the promotion of child health. In the conduct of effective child-health programs the voluntary agency can be of great assistance and the cooperation of boards of education is essential. Too often in the past we have considered the routine medical inspection of school children as fulfilling our obligation to the school child. As a matter of fact, our obligation has just started when the medical inspection has been completed, and our efforts shall have been time lost unless ways and means are provided for bringing about the correction of the physical defects found. To accomplish this many plans may be resorted to, but first of all the child himself should be induced to become interested in his own physical welfare. It is possible that his interest and cooperation may be brought about through constant classroom instruction; but he will be more interested if he knows that his teacher

and his parents are also concerned. Usually without the cooperation of the parent and the teacher, the child's interest will soon lag. Active parent-teacher associations are, therefore, necessary, and the public-health nurse or health officer who can create what may be termed "a community health spirit" has won half the battle.

Competition between schools for obtaining corrections of physical defects is frowned upon by some of our leading health educators; but, in the last analysis, results are what we are seeking, and if better results may be obtained through competitive programs, why should not competition be advocated by public health workers? Perhaps one of the most effective systems is that of furnishing to each teacher a classroom health chart to be publicly displayed. This shows by red stars the normal conditions found in each child at examination, by blue stars the physical defects corrected by each child after the examination is completed, and by gold stars those children who have had all corrections made. As a further inducement a blue ribbon may be offered to those children who have had corrections completed; also a holiday at some period late in the school year may be offered to individual classes which reach a certain definite percentage of defects corrected through the year. Such a program may be put on a still further competitive basis by offering a silver cup or other appropriate prize to the school, the entire enrollment of which has made the greatest progress in public health advancement. To put over such a health program requires leadership on the part of the health officer and the public health nurses who come in contact with the school children, their teachers, and parents.

While great progress has been made during the last two decades in the reduction of the national tuberculosis rate, it is considered by many experts that the tuberculosis rate can not be reduced much further under our present methods of tuberculosis control. Further reduction will necessitate a more careful examination of tuberculosis contacts and suspects by medical men who are experienced in tuberculosis work and are able to detect the disease in its early stages. It will also require a much more thorough follow-up system on the part of our health departments in order that the education of individuals may be more effective. Usually expert assistance may be had for the examination of tuberculous suspects if chest clinics are held periodically through the year. The cost of necessary X-ray examinations may be provided if the necessity therefor is properly presented to interested voluntary agencies.

There is little that is more appealing to the public mind than the organization and conduct of crippled children's societies on a county-wide basis. Such societies should not be maintained by the solicitation of funds from individuals, but should be supported by memberships of various kinds to be sold to those who are interested in that

particular phase of public health work. The memberships may cost varying sums, depending upon the type desired by the individual. They may be designated as members, sustaining members, contributing members, or life members, each membership to cost such sums as agreed upon by vote of the society. Crippled children's societies, if organized and conducted properly, can always count upon support from Rotary clubs, Kiwanis clubs, medical societies, and other organizations which are usually interested in that type of work. Under such an organization all cripples of whatever age, financial standing or degree of deformity, should be offered free examination and advice, but should be required to pay such amount as they are able for corrective work done. Where individuals are not in a position to pay in full or in part for corrections made, the service should be given them without cost. The county health department is in the best position to foster such a program and, through the routine examination of all school children, it is in a position to discover all the crippled population of an entire county. The health officer who is sufficiently aggressive, farsighted, and interested to put over successfully such a program always utilizing the public to the greatest advantage, need not worry about the next year's budget for his health department.

Another very important activity to be considered, where funds will permit, is the conduct of oral hygiene campaigns in connection with county health programs. This service may be given at comparatively small cost to the health department, if a minimum charge is made for the work done. Boards of education can usually be convinced of the necessity for dental corrective work and their cooperation may be obtained in bringing it about, if definite information is presented, showing the number of children in need and the extent of the need for each child. The equipment necessary need not be elaborate to begin with and the program should be started on a small scale. A dentist may be engaged for only a few hours a day if funds will not permit of his employment for longer periods. Portable equipment, purchased by the board of education or by interested lay societies or organizations, may be moved from school to school where rural schools are being served. A central operating room for the dentist may be established where city schools are being served, and the children may be required to appear at the dentist's office according to a schedule previously arranged by the school nurse.

Depending upon the demand for the service at later periods, a more elaborate equipment may be purchased and more personnel may be employed. Under such a program, cleaning of the teeth, extractions, temporary fillings, and the treatment of mouth infections should be considered a duty of the dentist in charge. Where or when available funds will permit, this service should be given to all children through the grade-school age without cost. The program should be approved

by the local dental society and, if possible, local dentists should be induced to do the work. In one county in a Pacific Coast State, such a program has been developed within a period of three years from a few hours' service given on three days a week by a dentist selected by the local society, to the employment of two full-time dentists on an annual basis, with full equipment to care for all of the children of the entire county. One of the dentists gives her entire time to city school children and is established in a central office where the children come by appointment. The other travels from one rural school to another in a large inclosed truck which is completely equipped as a dental office and includes all necessary instruments, sterilizing equipment, compressed air, filing cabinets for keeping records, and a sufficient water supply for each day's work. Some time after the system had been working in full force the writer had occasion to talk to the president and other members of the local dental society and was told that the educational work resulting from the dental hygiene campaign had not only relieved the members of the society engaged in private practice from doing a type of work for which they do not particularly care, but that it had doubled the demand for corrective work in the older children of grade-school and high-school age. In such programs women dentists may be employed if it is possible to obtain them, as they are usually very successful with small children and can be depended upon to stay with the work for long periods.

It is believed by health officers who have included dental hygiene as a routine part of their public health programs, that there is no phase of work which is more popular with the public, especially with the people of the rural areas, than is the dental hygiene program. Certainly there is little more far-reaching in its effect upon the physical welfare of an individual than good teeth. More attention should be given to the care of the teeth during the early years of life, and this field offers an opportunity to the local health officer to render a greatly neglected and much needed service to approximately 70 per cent of the child population of his community.

Many other new and important activities are now confronting the county health officer which were not formerly considered a part of the county health program. They are demanding time and attention and the routine public health program of the future must be arranged so as to include them. Among those of most importance may be mentioned studies in mental hygiene, educational programs pertaining to the control of cancer and tuberculosis through early diagnosis and treatment; the correction of endocrinological deficiencies in the infant, preschool, and grade-school child; the establishment of nutritional and prenatal clinics; and similar activities. In that one of the aims of the modern health movement is the prolongation of life, the health department may also be particularly concerned in the great

increase of deaths occurring during recent years as a result of automobile accidents. Every effort should be made by public health officials in cooperation with law-enforcement officials to keep constantly before the public knowledge of the great toll of lives that are unnecessarily being lost each year through careless driving and measures for meeting this situation.

Great progress was made through educational programs during and shortly after the World War in enlightening the public as to the dangers of venereal disease. It seems that there has been a considerable let-up on the part of public health officials during recent years in their efforts to control venereal infections. To say nothing of the great loss of health and life incident to venereal infection, it is probable that these diseases are still responsible for the greatest economic loss to the people of the country of any group of diseases. Antivenereal disease educational programs and the conduct of venereal treatment clinics can not be too strongly urged as a routine procedure for the local health department. A county health program can not be considered as being a well-rounded program if it does not include this phase of work.

The several phases of public health mentioned above are of comparatively recent origin, but they must be met by the health program of the future. Though mention has not been made of the necessity for food and dairy sanitation, for farm sanitation, for immunization and vaccination campaigns against diphtheria, typhoid fever, and smallpox, for communicable disease control through isolation and quarantine, it is assumed that these activities are already established routine procedure of every active health department.

The movement for full-time county health departments throughout the country has made great progress during the 19 years since the first full-time unit was established on July 1, 1911, in the State of Washington. With 505 full-time county units in operation on January 1 of this year (1930), we will approach the 600 mark before the year is over. Approximately 24 per cent of our rural population is now being served by a health service that is reasonably effective, but which still has room for considerable improvement. We yet have about 3,000 counties in the United States in which full-time county or district health service is applicable. The development of this tremendous field in the future can take place only as fast as we can train personnel to take charge of the individual units. With so great a demand for trained personnel during the next 10 or 20 years, and with the many added responsibilities which are being incorporated into the public health program in increasing numbers each year, the public health official must be progressive if he would successfully meet the situation. The time when the political appointee can expect to be tolerated in the public health field without progressing with the movement is about past. The people the country over are very rapidly coming to know what the prevention of disease and the

promotion of the public health mean in a literal sense. They realize its importance both from the standpoint of the prevention of unnecessary suffering and death and from the standpoint of dollars and cents saved. Public sentiment, therefore, is demanding higher standards and more efficient health-protective service than could be given a decade ago, when public health appointments were made primarily to fulfill political obligations and, perhaps, secondarily, to the lowest bidder for the position. Since the full-time county health department movement started a little less than 20 years ago, the national death rate from all causes has dropped from a little more than 14 per 1,000 population to 11; the tuberculosis (respiratory) death rate has dropped from 138 per 100,000 population to 68; the infant-mortality rate has been reduced from 129 per 1,000 children born to 68; the typhoid fever rate has been reduced 80 per cent; and the diphtheria rate has been reduced about 65 per cent in the same period of time.

With such an enviable record to look back upon the public health field has greater progress to look forward to and to work for in the future. Although many of our public health executives are still handicapped by lack of funds to carry on rapidly expanding programs, it is nevertheless true that the health officer who possesses the qualifications of leadership, statesmanship, and organization ability, can frequently overcome handicaps which would otherwise completely retard his progress. We should therefore continue to carry on with ever broadening viewpoints of the rapidly growing and fascinating field of public health administration. The old adage "There is more in the man than there is in the land" is just as true of the field of public health as it is in farming, or in any other line of endeavor.

DEATH RATES IN A GROUP OF INSURED PERSONS

Rates for Principal Causes of Death for February, 1931

The accompanying table, taken from the Statistical Bulletin for March, 1931, issued by the Metropolitan Life Insurance Co., presents the mortality record of the industrial insurance department of the company for February, 1931, as compared with that for the preceding month and for the corresponding month of last year. It also gives a comparison of the cumulative rates for January and February of the years 1931 and 1930. The rates are based on a strength of approximately 19,000,000 insured persons in the United States and Canada.

With regard to health conditions in this group of persons during February, 1931, the Bulletin states:

> Although health conditions in both January and February were by no means as good as last year, the cumulative death rate for these two months is not far from the average for the same period during the last 10 years. The year-to-date mortality rate, in fact, was only 6.3 per cent higher than the minimum for this two-month period—recorded only last year.

The higher mortality this year has not applied to Canada and that part of the United States lying west of the Rocky Mountains. Among approximately one and one-quarter millions of Metropolitan policyholders who live in Canada, the early 1931 health record has indeed been better than ever before, and among 1,140,000 living west of the Rockies a slight drop is in evidence as compared with last year.

The relatively higher mortality in January and February was due, directly or indirectly, to the widespread prevalence of influenza and pneumonia. The combined death rate for these diseases at the end of February was 27.6 per cent higher than in 1930. As invariably happens when there is above-average prevalence of influenza, increased death rates were recorded for the principal degenerative conditions (heart disease, chronic nephritis, and cerebral hemorrhage). The mortality rates for cancer and diabetes also increased sharply, and it is certain that influenzal attacks hastened the deaths of many persons affected with these chronic conditions. The increase in the general death rate only serves to emphasize that any widespread outbreak of influenza, even though the type be relatively mild, constitutes a serious public health hazard.

There are three outstandingly favorable items in the early 1931 health record: (1) The remarkably low diphtheria death rate is foremost. The cumulative mortality rate for this disease is at the very low figure of 6.3 per 100,000, a drop of 37 per cent from the previous minimum for the like period of any year. (2) The mortality from tuberculosis has actually recorded a small decline in spite of the increase in the general death rate. This gives reason for the belief that the continuity of the drop in the tuberculosis mortality rate will not be interrupted this year. (3) Diseases incidental to pregnancy and childbirth caused fewer deaths in January and February than during the corresponding period of any previous year.

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

[Industrial insurance department, Metropolitan Life Insurance Co.]

Cause of death	Rate per 100,000 lives exposed[1]				
	Feb. 1931	Jan. 1931	Feb. 1930	Cumulative Jan.-Feb.	
				1931	1930
Total, all causes	1,034.4	989.5	963.8	1,010.9	951.3
Typhoid fever	1.3	1.4	1.3	1.4	1.2
Measles	3.0	2.6	3.3	2.8	2.7
Scarlet fever	4.1	3.3	3.9	3.7	3.8
Whooping cough	4.6	4.0	5.5	4.3	5.0
Diphtheria	5.7	6.8	9.0	6.3	10.0
Influenza	58.6	30.3	27.3	43.8	26.7
Tuberculosis (all forms)	81.9	78.0	82.3	79.8	80.9
Tuberculosis of respiratory system	72.2	69.9	71.9	71.0	70.8
Cancer	84.0	81.6	73.1	82.7	73.8
Diabetes mellitus	25.3	23.5	20.2	24.3	21.3
Cerebral hemorrhage	64.2	75.1	68.2	69.9	63.5
Organic diseases of heart	171.9	175.6	169.0	173.8	165.0
Pneumonia (all forms)	146.7	122.9	117.2	134.2	112.8
Other respiratory diseases	15.1	13.8	11.8	14.4	12.6
Diarrhea and enteritis	9.1	11.1	11.1	10.1	11.3
Bright's disease (chronic nephritis)	75.1	74.6	71.0	74.9	72.4
Puerperal state	10.9	11.1	14.4	11.0	13.1
Suicides	9.3	7.7	7.5	8.5	8.1
Homicides	5.6	6.8	5.5	6.2	6.3
Other external causes (excluding suicides and homicides)	51.5	58.2	58.7	55.1	60.1
Traumatism by automobiles	15.3	21.7	16.4	18.7	18.4
All other causes	206.5	200.9	203.5	203.6	200.8

[1] All figures in this table include insured infants under one year of age. The rates are subject to slight correction, since they are based on provisional estimates of lives exposed to risk.

COURT DECISION RELATING TO PUBLIC HEALTH

Conviction for unlawful possession of cocaine hydrochloride sustained.—(Montana Supreme Court; State *v.* Mah Sam Hing, 295 P. 1014; decided Feb. 2, 1931.) The defendant was convicted of violating section 3200 of the Revised Codes, 1921, by having unlawfully in his possession some cocaine hydrochloride. One of the points decided by the supreme court was that the drugs referred to in section 3200 were those enumerated in section 3186 of the Revised Codes as amended by chapter 5 of the laws of 1929. The court stated that, while the reference in section 3200 was originally to the drugs specified in section 3189, the later amendment of section 3186, being the most recent expression of the legislature with respect to the matter, superseded section 3189. Section 3186 specifically mentioned "alkaloid cocaine" or "any derivative" thereof, and there was testimony that hydrochloride cocaine was derived directly from alkaloid cocaine.

DEATHS FROM INFLUENZA AND PNEUMONIA IN LARGE CITIES

Deaths from influenza and pneumonia (all forms) in certain large cities of the United States during the five weeks ended April 4, 1931—a continuation of the table appearing on page 658 of the Public Health Reports dated March 20, 1931. (From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

City	Influenza					Pneumonia				
	Week ended—					Week ended—				
	April	March				April	March			
	4	28	21	14	7	4	28	21	14	7
Total	168	188	212	255	293	1,198	1,185	1,254	1,290	1,332
Akron	1	1	1	1	1	8	13	9	11	10
Albany	1	0	1	0	0	8	5	4	8	6
Atlanta	0	3	10	9	10	0	6	9	13	12
Baltimore	2	1	2	8	3	49	45	54	70	42
Birmingham	5	9	8	5	5	7	9	11	11	6
Boston	0	1	1	2	2	21	16	21	23	29
Bridgeport	1	2	2	4	1	4	5	7	5	4
Buffalo	3	2	4	1	3	26	31	41	25	35
Cambridge	0	0	0	0	2	4	3	1	2	3
Camden	0	0	0	0	0	7	8	12	11	2
Canton	1	1	3	7	1	2	3	6	6	3
Chicago	8	8	10	14	12	74	57	67	79	67
Cincinnati	5	3	5	6	9	12	16	10	21	16
Cleveland	4	7	8	7	17	34	31	35	38	40
Columbus	2	7	5	6	4	2	10	14	15	7
Dallas	7	8	3	3	2	21	18	12	11	8
Dayton	1	0	2	1	3	8	5	10	9	7
Denver	1	3	3	8	4	15	12	15	25	16
Des Moines	0	1	1	1	0	1	4	5	5	6
Detroit	5	6	10	7	16	41	42	41	40	44
Duluth	0	0	0	0	3	0	0	0	3	3
El Paso	1	2	0	2	2	5	3	4	4	6
Erie	1	2	0	3	2	2	4	4	2	3
Fall River	0	0	0	1	1	2	5	6	2	8
Flint	0	1	3	0	4	2	5	6	10	7
Fort Worth	2	1	1	2	0	5	6	7	4	5
Grand Rapids	0	0	2	1	3	1	2	4	0	1

Deaths from influenza and pneumonia (all forms) in certain large cities of the United States during the five weeks ended April 4, 1931, etc.—Continued

City	Influenza					Pneumonia				
	Week ended—					Week ended—				
	April	March				April	March			
	4	28	21	14	7	4	28	21	14	7
Houston	1	0	0	1	1	7	5	5	7	8
Indianapolis	1	2	0	1	2	14	16	16	26	19
Jersey City	0	1	0	2	1	15	9	15	15	12
Kansas City, Kans	2	0	1	3	2	4	8	8	5	7
Kansas City, Mo	0	1	3	1	2	13	11	27	16	23
Knoxville	2	0	1	5	0	2	5	2	2	1
Long Beach	0	0	0	1	1	0	3	5	1	2
Los Angeles	2	7	4	5	5	26	18	17	20	17
Louisville	1	1	5	5	1	17	7	11	23	22
Lowell	1	0	0	0	1	5	6	5	1	4
Lynn	0	0	0	1	1	6	3	5	5	4
Memphis	8	8	4	7	5	10	13	9	18	13
Miami	0	3	1	1	0	2	4	3	0	3
Milwaukee	4	4	2	5	8	5	8	12	8	19
Minneapolis	2	4	2	6	7	10	12	13	13	18
Nashville	7	1	2	3	11	6	5	7	6	13
New Bedford	0	0	0	0	0	8	2	5	2	5
New Haven	1	1	1	0	2	2	7	6	7	3
New Orleans	3	3	4	4	5	18	22	21	25	11
New York	17	18	22	22	30	283	258	241	255	291
Newark, N. J.	0	0	0	0	0	16	11	10	13	7
Oakland	2	1	2	3	1	3	6	4	6	5
Oklahoma City	3	5	5	0	2	18	17	8	12	6
Omaha	0	0	0	0	0	10	8	10	9	13
Paterson	0	0	0	1	1	4	5	2	7	3
Philadelphia	11	9	15	12	16	100	88	100	83	87
Pittsburgh	9	11	8	14	21	42	69	53	66	62
Portland, Oreg.	1	4	1	2	2	9	11	6	10	11
Providence	0	0	0	4	1	14	8	13	5	11
Richmond	0	5	0	3	2	5	4	7	7	7
Rochester	0	1	1	2	1	5	11	11	10	13
St. Louis	5	0	2	4	0	31	32	23	28	47
St. Paul	0	0	4	2	2	7	7	13	7	11
Salt Lake City	2	2	1	0	1	2	2	1	3	0
San Antonio	8	5	3	3	7	6	9	6	3	17
San Diego	1	0	1	0	1	4	2	4	3	2
San Francisco	1	4	6	4	5	4	5	11	11	15
Schenectady	1	1	0	2	1	4	2	0	3	4
Seattle	7	8	10	10	14	7	7	14	10	12
Somerville	0	0	0	0	0	4	2	2	5	4
South Bend	0	0	0	0	0	0	5	5	2	6
Spokane	1	1	6	1	2	1	1	7	3	2
Springfield, Mass.	0	0	0	2	1	10	5	3	8	9
Syracuse	0	1	1	0	0	1	3	8	4	7
Tacoma	2	4	3	4	3	3	8	8	4	3
Toledo	4	1	3	7	5	17	12	8	16	11
Trenton	0	1	0	1	0	10	10	3	9	6
Utica	0	0	0	0	0	4	5	4	1	3
Washington, D. C.	3	1	3	0	3	17	30	31	15	25
Waterbury	0	0	0	0	1	5	2	3	2	2
Wilmington, Del.	1	0	0	0	1	6	8	3	3	4
Worcester	0	0	0	0	0	7	4	7	4	2
Yonkers	0	0	0	0	0	2	4	7	4	2
Youngstown	3	0	0	2	4	6	6	11	6	12

DEATHS DURING WEEK ENDED APRIL 4, 1931

Summary of information received by telegraph from industrial insurance companies for the week ended April 4, 1931, and corresponding week of 1930. (From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended April 4, 1931	Corresponding week, 1930
Policies in force	75, 139, 274	75, 712, 783
Number of death claims	13, 411	15, 574
Death claims per 1,000 policies in force, annual rate	9. 3	10. 7

Deaths*[1] *from all causes in certain large cities of the United States during the week ended April 4, 1931, infant mortality, annual death rate, and comparison with corresponding week of 1930. (From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

[The rates published in this summary are based upon mid-year population estimates derived from the 1930 census]

City	Week ended Apr. 4, 1931				Corresponding week, 1930		Death rate [2] for the first 14 weeks	
	Total deaths	Death rate [2]	Deaths under 1 year	Infant mortality rate [3]	Death rate [2]	Deaths under 1 year	1931	1930
Total (81 cities)	8,929	13.1	787	[4] 62	13.5	904	14.0	13.8
Akron	34	6.9	5	49	9.6	7	8.5	8.9
Albany [5]	32	12.9	1	20	17.1	4	15.1	16.6
Atlanta	74	13.9	12	123	14.2	5	16.6	17.2
White	34		3	48		2		
Colored	40	(6)	9	259	(6)	3	(6)	(6)
Baltimore [5]	244	15.6	18	61	16.1	22	17.4	15.8
White	174		13	56		14		
Colored	70	(6)	5	78	(6)	8	(6)	(6)
Birmingham	102	19.7	7	70	13.3	8	15.8	14.5
White	49		5	86		0		
Colored	53	(6)	2	49	(6)	8	(6)	(6)
Boston	221	14.7	22	63	16.7	26	16.6	16.1
Bridgeport	32	11.3	1	17	12.1	2	13.1	14.2
Buffalo	161	14.4	13	53	15.9	24	15.5	14.5
Cambridge	28	12.8	2	40	16.0	2	14.1	14.5
Camden	35	15.3	2	35	18.4	7	18.4	15.4
Canton	28	13.7	4	91	9.4	8	11.2	11.5
Chicago [5]	729	11.0	73	65	12.6	95	12.0	11.8
Cincinnati	151	17.2	11	66	19.0	29	17.9	17.7
Cleveland	236	13.5	15	44	11.6	15	12.7	12.3
Columbus	97	17.1	4	39	16.3	13	15.2	15.3
Dallas	76	14.6	4		11.3	7	12.7	12.6
White	55		3			7		
Colored	21	(6)	1		(6)	0	(6)	(6)
Dayton	60	15.1	5	70	9.0	2	14.1	10.5
Denver	86	15.4	5	48	17.7	8	16.0	15.7
Des Moines	25	9.0	1	18	12.0	3	12.5	12.8
Detroit	315	9.9	34	54	11.4	54	9.7	10.5
Duluth	14	7.2	0	0	9.2	1	11.6	11.3
El Paso	41	20.4	5		19.8	3	18.8	18.6
Erie	24	10.6	2	37	12.6	1	11.5	11.4
Fall River [5] [7]	33	14.9	2	45	12.7	8	14.0	14.0
Flint	19	6.0	4	51	8.3	6	8.0	10.3
Fort Worth	43	13.4	3		11.4	4	12.1	12.3
White	39		3			3		
Colored	4	(6)	0		(6)	1	(6)	(6)
Grand Rapids	27	8.2	1	15	17.6	3	9.7	11.9
Houston	61	10.3	6		11.3	6	11.9	13.0
White	39		3			4		
Colored	22	(6)	3		(6)	2	(6)	(6)
Indianapolis	94	13.3	5	41	15.3	5	15.5	16.3
White	74		4	38		2		
Colored	20	(6)	1	67	(6)	3	(6)	(6)
Jersey City	90	14.7	14	124	13.0	13	13.8	12.7
Kansas City, Kans	35	14.8	1	21	16.7	2	15.8	13.0
White	29		1	25		1		
Colored	6	(6)	0	0	(6)	1	(6)	(6)
Kansas City, Mo	113	14.4	10	76	14.5	8	15.5	14.4
Knoxville	31	14.8	2	43	9.8	3	14.5	16.0
White	26		2	48		3		
Colored	5	(6)	0	0	(6)	0	(6)	(6)
Long Beach	27	9.2	0	0	10.1	2	10.8	10.6
Los Angeles	233	9.2	16	46	10.8	21	11.8	12.2
Louisville	106	17.9	11	94	14.4	6	17.5	14.7
White	83		7	69		6		
Colored	23	(6)	4	265	(6)	0	(6)	(6)
Lowell [7]	31	16.0	2	51	11.9	3	15.1	15.2
Lynn	24	12.2	1	26	6.1	1	12.8	12.0
Memphis	112	22.6	14	148	19.9	9	18.6	18.2
White	61		6	100		5		
Colored	51	(6)	8	232	(6)	4	(6)	(6)
Miami	21	9.7	1	25	16.4	3	14.6	13.9
White	14		0	0		1		
Colored	7	(6)	1	88	(6)	2	(6)	(6)

See footnotes at end of table.

Deaths [1] from all causes in certain large cities of the United States during the week ended April 4, 1931, infant mortality, annual death rate, and comparison with corresponding week of 1930—Continued

City	Week ended Apr. 4, 1931				Corresponding week, 1930		Death rate [2] for the first 14 weeks	
	Total deaths	Death rate [2]	Deaths under 1 year	Infant mortality rate [3]	Death rate [2]	Deaths under 1 year	1931	1930
Milwaukee	109	9.6	11	48	10.0	14	10.7	10.8
Minneapolis	100	11.0	13	84	10.5	8	12.4	11.4
Nashville	69	23.1	6	89	24.7	9	18.7	17.9
White	33		5	100		6		
Colored	36	(6)	1	59	(6)	3	(6)	(6)
New Bedford [7]	28	13.0	6	159	14.8	3	13.4	12.3
New Haven	34	10.9	3	57	11.2	3	13.b	14.8
New Orleans	161	18.0	19	104	18.0	17	19.7	19.5
White	97		7	58		10		
Colored	64	(6)	12	196	(6)	7	(6)	(6)
New York	1,737	12.8	147	61	13.0	138	13.5	12.2
Bronx borough	229	9.0	25	57	8.5	7	9.8	8.7
Brooklyn borough	600	11.9	50	53	11.9	61	12.6	11.3
Manhattan borough	693	19.9	53	90	19.4	49	20.6	18.1
Queens borough	165	7.5	17	46	9.3	16	8.7	8.0
Richmond borough	50	16.0	2	36	16.7	5	14.5	15.2
Newark, N. J	111	13.0	12	63	12.7	11	13.8	14.1
Oakland	62	11.1	2	26	8.4	3	12.2	12.2
Oklahoma City	62	16.4	7	97	10.8	4	12.0	10.7
Omaha	56	13.5	2	22	14.6	2	15.1	14.4
Paterson	30	11.3	3	52	13.2	4	15.8	13.6
Philadelphia	518	13.7	62	90	15.0	62	16.0	14.1
Pittsburgh	201	15.5	15	52	15.2	24	17.9	15.7
Portland, Oreg	71	12.1	3	36	10.7	3	13.0	13.9
Providence	69	14.1	12	111	16.7	8	15.3	15.5
Richmond	55	15.6	4	58	13.9	6	17.8	16.3
White	37		1	22		3		
Colored	18	(6)	3	130	(6)	3	(6)	(6)
Rochester	79	12.4	6	55	13.8	9	14.0	13.1
St. Louis	289	18.2	10	34	16.2	13	18.4	15.2
St. Paul	61	11.5	4	41	10.5	5	11.8	11.3
Salt Lake City [8]	29	10.6	4	60	19.6	6	13.2	14.5
San Antonio	63	13.7	11		19.0	15	15.2	18.8
San Diego	51	17.0	3	61	9.8	4	15.8	15.6
San Francisco	155	12.4	5	33	14.3	9	14.7	14.1
Schenectady	19	10.3	1	29	15.8	4	11.8	11.9
Seattle	110	15.4	5	47	11.4	3	13.4	12.0
Somerville	24	11.9	2	74	10.0	2	11.3	12.6
South Bend	19	9.2	3	75	11.4	1	9.4	9.9
Spokane	31	14.9	0	0	10.8	3	13.4	13.2
Springfield, Mass	41	14.0	7	107	13.9	3	14.0	14.6
Syracuse	47	11.5	4	47	12.7	4	12.9	12.9
Tacoma	27	13.1	2	51	14.1	1	15.3	13.5
Toledo	79	13.9	7	64	15.9	5	13.8	14.3
Trenton	51	21.5	7	122	14.4	4	19.9	18.2
Utica	35	17.8	0	0	22.5	6	16.6	16.7
Washington, D. C	139	14.7	9	50	16.7	19	18.4	16.1
White	83		5	41		6		
Colored	56	(6)	4	69	(6)	13	(6)	(6)
Waterbury	21	10.9	7	211	9.9	1	11.4	11.2
Wilmington, Del. [7]	34	16.6	4	86	16.6	1	16.6	15.9
Worcester	53	14.0	9	123	17.3	8	15.0	15.6
Yonkers	11	4.1	3	79	10.4	3	10.3	9.2
Youngstown	43	13.0	8	112	12.5	7	11.8	11.0

[1] Deaths of nonresidents are included. Stillbirths are excluded.
[2] These rates represent annual rates per 1,000 population, as estimated for 1931 and 1930 by the arithmetical method.
[3] Deaths under 1 year of age per 1,000 live births. Cities left blank are not in the registration area for births.
[4] Data for 76 cities.
[5] Deaths for week ended Friday.
[6] For the cities for which deaths are shown by color, the percentage of colored population in 1920 was as follows: Atlanta, 31; Baltimore, 15; Birmingham, 39; Dallas, 15; Fort Worth, 14; Houston, 25; Indianapolis, 11; Kansas City, Kans., 14; Knoxville, 15; Louisville, 17; Memphis, 38; Miami, 31; Nashville, 30; New Orleans, 26; Richmond, 32; and Washington, D. C., 25.
[7] Population Apr. 1, 1930; decreased 1920 to 1930, no estimate made.

PREVALENCE OF DISEASE

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

UNITED STATES

CURRENT WEEKLY STATE REPORTS

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

Reports for Weeks Ended April 11, 1931, and April 12, 1930

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 11, 1931, and April 12, 1930

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 11, 1931	Week ended Apr. 12, 1930	Week ended Apr. 11, 1931	Week ended Apr. 12, 1930	Week ended Apr. 11, 1931	Week ended Apr. 12, 1930	Week ended Apr. 11, 1931	Week ended Apr. 12, 1930
New England States:								
Maine	3	1	6	7	18	40	0	0
New Hampshire		1		2	38		0	0
Vermont					3	13	0	0
Massachusetts	52	40	8	8	478	1,294	3	2
Rhode Island	4	7	1		40	4	0	0
Connecticut	8	11	5	5	795	20	0	2
Middle Atlantic States:								
New York	119	157	[1] 20	[1] 32	2,137	1,448	17	33
New Jersey	51	90	24	24	920	1,219	8	5
Pennsylvania	96	107			4,740	1,389	14	26
East North Central States:								
Ohio	52	53	115	47	852	665	2	9
Indiana	28	22	32		953	107	15	11
Illinois	146	133	18	16	1,650	923	27	16
Michigan	15	78	18	3	93	1,998	13	41
Wisconsin	9	13	58	108	682	899	4	3
West North Central States:								
Minnesota	7	4	1	3	137	304	2	2
Iowa	3	7			19	362	2	5
Missouri	26	34	30	11	447	63	12	20
North Dakota	4	8			84	50	0	3
South Dakota	5	5	5	2	168	164	0	1
Nebraska	16	20			7	529	1	1
Kansas	9	6	3	5	23	744	3	4
South Atlantic States:								
Delaware	3	3			228	6	0	0
Maryland [2]	16	17	40	44	1,396	42	4	1
District of Columbia	6	9	3		373	12	0	1
Virginia								
West Virginia	8	14	168	28	94	137	1	2
North Carolina	20	40	32	71	1,015	41	3	9
South Carolina	4	14	1,153	603	105		4	0
Georgia [3]	6	9	410	77	146	192	1	1
Florida	6	10	68	3	260	529	1	2
East South Central States:								
Kentucky					362	46	4	11
Tennessee	2	9	205	57	51	216	2	30
Alabama	12	13	345	95	483	172	5	2
Mississippi	2	5					2	15

[1] New York City only. [2] Week ended Friday. [3] Typhus fever; 1 case in Georgia.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 11, 1931, and April 12, 1930—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr. 11, 1931	Week ended Apr. 12, 1930	Week ended Apr. 11, 1931	Week ended Apr. 12, 1930	Week ended Apr. 11, 1931	Week ended Apr. 12, 1930	Week ended Apr. 11, 1931	Week ended Apr. 12, 1930
West South Central States:								
Arkansas	2	1	209	83	24	61	1	4
Louisiana	15	18	57	10	8	78	2	5
Oklahoma [4]	17	16	150	74	21	450	2	2
Texas	20	28	77	41	67	180	1	0
Mountain States:								
Montana	3	2	----	----	72	41	0	2
Idaho	5	----	4	----	5	31	1	0
Wyoming	1	1	----	----	3	13	0	0
Colorado	10	5	----	----	139	950	0	3
New Mexico	1	9	6	----	46	81	2	6
Arizona	----	5	3	9	21	38	0	5
Utah [3]	----	1	6	3	1	297	1	12
Pacific States:								
Washington	10	2	37	4	35	281	0	6
Oregon	6	4	72	39	113	159	1	1
California	70	58	100	23	1,532	2,524	7	10

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 11, 1931	Week ended Apr. 12, 1930	Week ended Apr. 11, 1931	Week ended Apr. 12, 1930	Week ended Apr.11, 1931	Week ended Apr. 12, 1930	Week ended Apr. 11, 1931	Week ended Apr. 12, 1930
New England States:								
Maine	0	0	37	56	0	0	2	1
New Hampshire	0	0	0	20	0	0	1	0
Vermont	0	0	2	8	1	2	0	0
Massachusetts	0	1	342	292	0	0	0	6
Rhode Island	0	0	56	25	0	0	0	0
Connecticut	0	0	55	101	0	0	1	1
Middle Atlantic States:								
New York	5	1	932	589	5	14	16	6
New Jersey	0	1	287	267	0	0	3	4
Pennsylvania	0	1	640	519	0	1	11	6
East North Central States:								
Ohio	0	0	490	440	78	156	1	5
Indiana	0	0	320	212	91	167	2	5
Illinois	1	0	512	554	62	130	7	7
Michigan	0	0	280	389	31	62	2	8
Wisconsin	1	0	123	185	5	16	0	2
West North Central States:								
Minnesota	0	0	82	137	6	7	1	4
Iowa	1	0	119	105	73	122	0	0
Missouri	0	0	269	137	30	58	0	1
North Dakota	1	0	26	36	14	19	6	1
South Dakota	0	0	31	14	19	51	0	0
Nebraska	0	0	38	110	48	105	0	0
Kansas	1	0	65	170	116	135	2	1
South Atlantic States:								
Delaware	0	0	31	5	0	0	0	0
Maryland [3]	0	1	71	131	0	0	6	6
District of Columbia	0	0	20	23	0	0	1	0
Virginia	----	1	----	----	----	1	----	----
West Virginia	0	0	44	44	2	0	4	6
North Carolina	0	1	30	32	2	17	2	3
South Carolina	1	1	8	1	0	0	0	5
Georgia [3]	1	0	107	20	0	0	2	7
Florida	0	0	2	9	1	0	3	2
East South Central States:								
Kentucky	0	1	84	55	33	26	1	5
Tennessee	0	9	35	57	9	8	6	7
Alabama	0	0	16	9	16	8	3	1
Mississippi	1	1	21	10	64	15	5	9

[3] Week ended Friday.
[3] Typhus fever; 1 case in Georgia.
[4] Figures for 1931 are exclusive of Oklahoma City and Tulsa.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended April 11, 1931, and April 12, 1930—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr. 11, 1931	Week ended Apr. 12, 1930	Week ended Apr. 11, 1931	Week ended Apr. 12, 1930	Week ended Apr. 11, 1931	Week ended Apr. 12, 1930	Week ended Apr. 11, 1931	Week ended Apr. 12, 1930
West South Central States:								
Arkansas	0	0	21	18	39	6	5	0
Louisiana	1	0	18	18	40	9	3	16
Oklahoma [4]	0	0	39	41	95	98	3	4
Texas	1	0	42	42	40	67	4	9
Mountain States:								
Montana [3]	0	0	20	35	6	20	1	1
Idaho	1	0	9	2	4	9	2	0
Wyoming	0	0	13	1	1	5	0	0
Colorado	0	0	23	40	5	15	0	0
New Mexico	0	0	10	13	0	4	1	0
Arizona	0	0	0	19	1	31	1	0
Utah [3]	0	0	7	13	0	0	0	0
Pacific States:								
Washington	0	0	48	51	51	97	3	2
Oregon	0	0	9	17	21	16	3	1
California	4	3	111	163	42	105	10	5

[3] Week ended Friday. [4] Figures for 1931 are exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
February, 1931										
Colorado	10	37	4	----	758	----	0	200	28	5
Mississippi	15	67	8,479	1,115	190	528	1	131	90	20
March, 1931										
Connecticut	8	33	112	----	3,065	----	0	277	0	2
Dist. of Columbia	15	61	12	----	950	----	0	127	0	1
Maine	3	12	183	----	214	----	0	143	0	4
Massachusetts	8	201	65	----	2,023	----	3	1,637	0	9
North Dakota	1	19	21	----	156	----	1	106	35	4
Porto Rico	----	33	1,021	1,834	38	3	0	----	0	26
Tennessee	62	57	1,938	33	1,651	26	0	561	73	28

February, 1931	Cases
Chicken pox:	
Colorado	321
Mississippi	1,092
Dengue:	
Mississippi	8
Dysentery:	
Mississippi (amebic)	27
Mississippi (bacillary)	170
German measles:	
Colorado	3
Hookworm disease:	
Mississippi	233
Impetigo contagiosa:	
Colorado	2
Jaundice:	
Colorado	1
Mumps:	
Colorado	207
Mississippi	348
Ophthalmia neonatorum:	
Colorado	1
Mississippi	14
Puerperal septicemia:	
Mississippi	39
Rabies in animals:	
Mississippi	10
Trachoma:	
Mississippi	7
Undulant fever:	
Colorado	1

Vincent's angina:	Cases
Colorado	3
Whooping cough:	
Colorado	169
Mississippi	442

March, 1931

Anthrax:	
Massachusetts	1
Porto Rico	7
Chicken pox:	
Connecticut	392
District of Columbia	204
Maine	216
Massachusetts	1,050
North Dakota	154
Porto Rico	32
Tennessee	443
Conjunctivitis:	
Connecticut	7
Dysentery:	
Porto Rico	18
Tennessee	3
Filariasis:	
Porto Rico	4
German measles:	
Connecticut	23
Maine	7
Massachusetts	483
Tennessee	6
Lead poisoning:	
Connecticut	3
Massachusetts	4
Lethargic encephalitis:	
Connecticut	1
Massachusetts	6
Tennessee	1
Mumps:	
Connecticut	327
Maine	262
Massachusetts	683
North Dakota	117
Porto Rico	5
Tennessee	159
Ophthalmia neonatorum:	
Massachusetts	145
Porto Rico	4
Tennessee	2
Paratyphoid fever:	
Porto Rico	2
Puerperal septicemia:	
Porto Rico	10
Tennessee	4
Rabies in animals:	
Connecticut	5
Rabies in man:	
Massachusetts	1
Scabies:	
North Dakota	6
Septic sore throat:	
Connecticut	9
Maine	1
Massachusetts	26
Tennessee	15
Tetanus:	
Porto Rico	8
Tennessee	1
Tetanus, infantile:	
Porto Rico	9
Trachoma:	
Maine	1
Massachusetts	3
Porto Rico	5
Tennessee	5
Trichinosis:	
Massachusetts	1
Tularaemia:	
Tennessee	1
Undulant fever:	
Connecticut	2
Massachusetts	3
North Dakota	1
Tennessee	1
Vincent's angina:	
Maine	7
North Dakota	56
Tennessee	11
Whooping cough:	
Connecticut	396
District of Columbia	35
Maine	176
Massachusetts	877
North Dakota	60
Porto Rico	236
Tennessee	169

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 96 cities reporting cases used in the following table are situated in all parts of the country and have an estimated aggregate population of more than 33,340,000. The estimated population of the 89 cities reporting deaths is more than 31,795,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended April 4, 1931, and April 5, 1930

	1931	1930	Estimated expectancy
Cases reported			
Diphtheria:			
46 States	852	1,181	
96 cities	340	496	841
Measles:			
45 States	19,091	16,844	
96 cities	7,202	6,329	
Meningococcus meningitis:			
45 States	153	275	
96 cities	86	150	
Poliomyelitis:			
46 States	19	21	
Scarlet fever:			
46 States	5,731	4,855	
96 cities	2,372	1,881	1,537
Smallpox:			
46 States	1,008	1,673	
96 cities	86	146	65
Typhoid fever:			
46 States	115	156	
96 cities	23	28	27
Deaths reported			
Influenza and pneumonia:			
89 cities	1,188	1,040	
Smallpox:			
89 cities	0	0	

City reports for week ended April 4, 1931

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

If the reports have not been received for the full nine years, data are used for as many years as possible, but no year earlier than 1922 is included. In obtaining the estimated expectancy, the figures are smoothed when necessary to avoid abrupt deviation from the usual trend. For some of the diseases given in the table the available data were not sufficient to make it practicable to compute the estimated expectancy.

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
		Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
NEW ENGLAND								
Maine:								
Portland	4	0	0		0	0	7	1
New Hampshire:								
Concord	0	0	0		0	4	0	0
Manchester	0	0	0		2	0	0	3
Nashua	0	0	0		0	10	0	0
Vermont:								
Barre	1	0	0		0	0	0	0
Burlington	0	0	1		0	0	0	0
Massachusetts:								
Boston	49	30	15	3	0	105	9	11
Fall River	2	3	2		0	3	9	2
Springfield	0	3	0		0	7	15	0
Worcester	7	4	0		0	6	17	7
Rhode Island:								
Pawtucket	1	1	0		0	0	0	2
Providence	0	8	2		0	28	4	14
Connecticut:								
Bridgeport	1	5	0		0	2	1	4
Hartford	0	4	0		0	17	1	4
New Haven	17	0	0		1	288	6	2

City reports for week ended April 4, 1931—Continued

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
		Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
MIDDLE ATLANTIC								
New York:								
Buffalo	5	11	6	3	0	240	45	26
New York	304	250	77	52	17	1,331	67	283
Rochester	7	8	0	2	0	6	4	5
Syracuse	17	4	2		0	9	1	1
New Jersey:								
Camden	5	5	3		0	37	7	7
Newark	104	16	9	4	0	32	7	16
Trenton	5	3	0	1	0	1	3	10
Pennsylvania:								
Philadelphia	102	60	6	16	11	976	29	100
Pittsburgh	54	15	5	10	9	113	35	42
Reading	9	3	0		1	51	16	8
EAST NORTH CENTRAL								
Ohio:								
Cincinnati	9	8	3	1	5	103	30	12
Cleveland	158	26	11	20	4	48	251	34
Columbus	30	3	2	9	2	9	3	2
Toledo	13	3	2	4	4	1	23	17
Indiana:								
Fort Wayne	1	2	10		0	40	0	2
Indianapolis	26	4	0		1	279	2	17
South Bend		0						
Terre Haute	1	0	0		0	1	0	2
Illinois:								
Chicago	106	95	60	13	8	375	61	74
Springfield	5	1	1		0	220	12	3
Michigan:								
Detroit	123	42	15	10	5	16	57	41
Flint	20	2	0	5	0	0	8	2
Grand Rapids	0	1	0		0	13	0	1
Wisconsin:								
Kenosha	6	0	0		0	0	72	0
Madison	37	1	2		0	1	15	
Milwaukee	119	13	3	4	4	85	342	5
Racine	6	2	0		0	8	5	1
Superior	14	0	0		0	0	0	1
WEST NORTH CENTRAL								
Minnesota:								
Duluth	2	0	0		0	0	1	0
Minneapolis	25	12	3		2	27	34	10
St. Paul	36	7	0	2	2	29	1	7
Iowa:								
Davenport	0	0	0			1	0	
Des Moines	2	1	0			1	0	
Sioux City	16	1	0			5	22	
Waterloo	7	0	0			1	0	
Missouri:								
Kansas City	35	4	3		0	142	3	13
St. Joseph	2	1	2		0	13	0	7
St. Louis	21	36	10	7		60	15	
North Dakota:								
Fargo	2	0	0		0		11	0
Grand Forks	1	0	2			0	1	
South Dakota:								
Aberdeen	17	0	0			5	0	
Sioux Falls	0	0	0			0	0	
Nebraska:								
Omaha	8	2	4		0	0	17	10
Kansas:								
Topeka	1	1	0	2	0	1	15	1
Wichita	9	1	0		0	0	0	3
SOUTH ATLANTIC								
Delaware:								
Wilmington	0	3	0		0	67	6	6
Maryland:								
Baltimore	92	23	8	5	2	1,032	26	49
Cumberland	0	0	0		0	0	0	2
Frederick	1	0	0		0	4	0	0
District of Columbia:								
Washington	32	11	6	4	3	327	0	17
Virginia:								
Lynchburg	32	1	1		0	9	0	1
Norfolk	24	2	1		0	110	6	2
Richmond	1	2	0		2	264	0	3
Roanoke	7	0	0		3	5	0	1

City reports for week ended April 4, 1931—Continued

Division, State, and city	Chicken pox, cases reported	Diphtheria		Influenza		Measles, cases reported	Mumps, cases reported	Pneumonia, deaths reported
		Cases, estimated expectancy	Cases reported	Cases reported	Deaths reported			
SOUTH ATLANTIC—CON.								
West Virginia:								
Charleston	2	0	1	6	1	2	2	2
Wheeling	18	1	0	----------	0	2	0	2
North Carolina:								
Raleigh	10	0	0	----------	0	22	0	0
Wilmington	3	0	1	----------	0	0	0	1
Winston-Salem	8	0	0	----------	0	47	7	3
South Carolina:								
Charleston	0	0	3	73	0	13	0	5
Columbia	2	0	0	----------	1	1	8	5
Georgia:								
Atlanta	3	2	2	60	2	26	2	11
Brunswick	0	0	0	----------	0	0	18	1
Savannah	4	1	0	25	4	3	12	2
Florida:								
Miami	13	3	1	2	0	6	0	2
Tampa	8	1	2	1	2	104	0	1
EAST SOUTH CENTRAL								
Kentucky:								
Covington	0	0	0	----------	0	29	1	3
Tennessee:								
Memphis	22	4	1	----------	8	67	6	10
Nashville	3	0	0	----------	7	99	0	6
Alabama:								
Birmingham	5	2	2	14	5	63	3	7
Mobile	0	1	2	----------	0	0	0	1
Montgomery	3	0	0	2	----------	0	10	----------
WEST SOUTH CENTRAL								
Arkansas:								
Fort Smith	2	0	0	----------	----------	2	0	----------
Little Rock	0	1	0	----------	0	0	1	9
Louisiana:								
New Orleans	20	11	19	1	3	1	0	18
Shreveport	3	0	0	----------	0	0	0	5
Oklahoma:								
Muskogee	0	0	0	5	----------	0	3	----------
Texas:								
Dallas	54	5	2	4	7	2	36	21
Fort Worth	5	2	5	----------	2	0	0	5
Galveston	1	0	0	----------	1	3	0	3
Houston	3	4	2	----------	1	11	0	7
San Antonio	2	3	2	----------	8	7	0	6
MOUNTAIN								
Montana:								
Billings	5	0	0	----------	1	0	0	1
Great Falls	----------	0	----------	----------	----------	----------	----------	----------
Helena	0	0	0	1	0	0	0	0
Missoula	0	0	0	----------	0	0	0	1
Idaho:								
Boise	3	0	0	----------	0	0	0	0
Colorado:								
Denver	59	7	5	----------	1	19	33	13
Pueblo	2	1	0	----------	0	56	0	1
New Mexico:								
Albuquerque	17	0	0	3	3	2	0	0
Arizona:								
Phoenix	0	1	0	----------	0	0	0	1
Utah:								
Salt Lake City	1	2	0	----------	1	1	12	2
Nevada:								
Reno	0	0	0	----------	0	0	0	0
PACIFIC								
Washington:								
Seattle	41	2	0	----------	----------	2	10	----------
Spokane	6	2	1	----------	----------	5	0	----------
Tacoma	7	1	4	----------	2	0	2	3
Oregon:								
Portland	18	7	0	5	1	19	8	9
Salem	4	0	0	----------	0	5	4	0
California:								
Los Angeles	63	38	15	40	2	171	6	15
Sacramento	5	1	1	9	1	2	2	2
San Francisco	40	15	6	33	1	3	0	2

City reports for week ended April 4, 1931—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases, reported	Cases, estimated expectancy	Cases, reported	Deaths, reported		Cases, estimated expectancy	Cases, reported	Deaths, reported		
NEW ENGLAND											
Maine:											
Portland	4	12	0	0	0	1	0	0	0	12	25
New Hampshire:											
Concord	0	0	0	0	0	0	0	0	0	0	12
Manchester	2	0	0	0	0	0	0	0	0	0	17
Nashua	0	0	0	0	0	0	0	0	0	0	----
Vermont:											
Barre	0	0	0	0	0	1	0	0	0	1	5
Burlington	2	0	0	0	0	0	0	0	0	3	9
Massachusetts:											
Boston	87	127	0	0	0	10	0	1	0	41	221
Fall River	6	12	0	0	0	2	0	0	0	2	33
Springfield	9	3	0	0	0	3	0	0	0	1	41
Worcester	10	28	0	0	0	2	0	0	0	7	53
Rhode Island:											
Pawtucket	2	11	0	0	0	0	0	0	0	2	17
Providence	13	34	0	0	0	2	0	0	0	5	69
Connecticut:											
Bridgeport	10	6	0	0	0	0	0	0	0	0	32
Hartford	6	4	0	0	0	1	0	0	0	1	31
New Haven	9	3	0	0	0	0	0	0	0	1	34
MIDDLE ATLANTIC											
New York:											
Buffalo	30	14	1	0	0	6	0	0	0	23	159
New York	361	511	1	0	0	100	8	3	0	131	1,737
Rochester	11	95	0	0	0	2	0	0	0	11	76
Syracuse	12	36	0	0	0	0	0	0	0	18	47
New Jersey:											
Camden	6	2	0	0	0	1	0	0	0	0	35
Newark	39	51	0	0	0	6	0	1	0	33	115
Trenton	5	8	0	0	0	2	0	1	0	0	51
Pennsylvania:											
Philadelphia	103	148	0	0	0	25	2	1	1	27	518
Pittsburgh	30	34	0	0	0	13	0	1	0	18	201
Reading	5	4	0	0	0	4	0	0	0	0	44
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	21	43	1	0	0	11	0	0	0	2	151
Cleveland	40	67	1	0	0	14	0	0	0	19	236
Columbus	12	7	1	0	0	5	0	0	0	0	97
Toledo	16	3	1	1	0	8	1	0	0	4	79
Indiana:											
Fort Wayne	5	1	1	1	0	0	1	0	0	1	34
Indianapolis	11	47	7	8	0	5	0	0	0	27	----
South Bend	4	----	0	----	----	----	0	----	----	----	----
Terre Haute	2	3	0	0	0	1	0	0	0	0	19
Illinois:											
Chicago	132	259	2	1	0	52	1	0	0	30	729
Springfield	2	5	0	0	0	0	0	0	0	0	28
Michigan:											
Detroit	116	140	1	0	0	19	0	0	0	59	315
Flint	13	17	2	1	0	1	0	0	0	6	19
Grand Rapids	10	11	0	1	0	1	0	1	1	15	27
Wisconsin:											
Kenosha	2	2	1	0	0	0	0	0	0	1	5
Madison	3	5	0	1	----	----	0	0	----	3	----
Milwaukee	28	11	0	1	0	6	0	0	0	14	109
Racine	4	4	0	0	0	0	0	0	0	19	15
Superior	4	1	0	0	0	0	0	0	0	0	7
WEST NORTH CENTRAL											
Minnesota:											
Duluth	9	0	0	0	0	1	0	0	0	0	14
Minneapolis	39	8	1	0	0	0	0	1	0	2	100
St. Paul	32	12	0	0	0	2	0	1	0	6	70

City reports for week ended April 4, 1931—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases, reported	Cases, estimated expectancy	Cases, reported	Deaths, reported		Cases, estimated expectancy	Cases, reported	Deaths, reported		
WEST NORTH CENTRAL—con.											
Iowa:											
Davenport	2	1	1	6			0	0		0	
Des Moines	11	4	2	8			0	0		0	25
Sioux City	0	17	1	1			0	0		3	
Waterloo	2	2	0	0			0	0		3	
Missouri:											
Kansas City	25	9	2	0	0	8	0	0	0	6	113
St. Joseph	2	17	0	0	0	0	0	0	0	0	24
St. Louis	34	225	2	3	0	9	1	0	3	5	289
North Dakota:											
Fargo	1	0	0	0	0	0	0	0	0	2	1
Grand Forks	2	0	0	0			0	0		2	
South Dakota:											
Aberdeen	1	0	0	0			0	0		0	
Sioux Falls	2	0	0	0			0	0		0	10
Nebraska:											
Omaha	4	12	3	15	0	4	0	0	0	2	56
Kansas:											
Topeka	4	3	1	1	0	0	0	0	0	2	15
Wichita	5	1	2	21	0	2	0	0	0	1	33
SOUTH ATLANTIC											
Delaware:											
Wilmington	5	9	0	0	0	1	0	0	0	0	34
Maryland:											
Baltimore	37	37	0	0	0	14	2	3	2	9	244
Cumberland	0	0	0	0	0	0	0	0	0	0	19
Frederick	0	1	0	0	0	0	0	0	0	0	3
District of Col.:											
Washington	25	23	1	0	0	12	1	0	0	7	139
Virginia:											
Lynchburg	0	0	0	0	0	1	0	0	0	0	15
Norfolk	1	2	0	0	0	1	0	0	0	1	
Richmond	3	3	0	0	0	1	0	0	0	0	58
Roanoke	1	0	0	0	0	0	0	0	0	2	21
West Virginia:											
Charleston	1	5	0	0	0	0	0	1	0	0	17
Wheeling	2	1	0	0	0	1	1	0	0	2	12
North Carolina:											
Raleigh	1	1	1	0	0	0	0	0	0	20	13
Wilmington	0	0	1	0	0	4	0	0	0	0	11
Winston-Salem	1	1	1	0	0	0	0	0	0	7	20
South Carolina:											
Charleston	0	1	0	0	0	1	0	2	1	0	26
Columbia	0	0	0	0	0	1	0	0	0	0	31
Georgia:											
Atlanta	5	62	2	1	0	2	0	1	0	2	74
Brunswick	0	0	0	0	0	0	0	0	0	0	4
Savannah	0	3	0	0	0	2	1	0	0	0	27
Florida:											
Miami	1	1	0	0	0	2	0	6	0	0	21
St. Petersburg	0										
Tampa	1	0	0	0	0	2	2	0	0	0	26
EAST SOUTH CENTRAL											
Kentucky:											
Covington	2	4	0	0	0	1	0	0	0	0	22
Tennessee:											
Memphis	10	51	2	2	0	6	1	0	0	8	112
Nashville	3	5	0	0	0	2	0	0	0	1	69
Alabama:											
Birmingham	3	7	1	0	0	4	1	0	0	7	102
Mobile	1	0	0	0	0	2	0	0	0	0	18
Montgomery	0	1	0	0			0	0		0	
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	0	0	0			0	0		0	
Little Rock	1	5	0	0	0	3	0	0	0	0	

City reports for week ended April 4, 1931—Continued

Division, State, and city	Scarlet fever		Smallpox			Tuberculosis, deaths reported	Typhoid fever			Whooping cough, cases reported	Deaths, all causes
	Cases, estimated expectancy	Cases, reported	Cases, estimated expectancy	Cases, reported	Deaths, reported		Cases, estimated expectancy	Cases, reported	Deaths, reported		
WEST SOUTH CENTRAL—con.											
Louisiana:											
New Orleans	8	15	0	18	0	17	2	2	1	8	161
Shreveport	1	1	0	1	0	1	0	0	0	1	38
Oklahoma:											
Muskogee	0	1	2	0	----	----	0	0	----	0	----
Texas:											
Dallas	5	2	3	0	0	2	0	1	1	6	76
Fort Worth	3	3	4	2	0	2	0	0	0	0	43
Galveston	0	0	0	0	0	2	0	0	0	0	23
Houston	1	5	2	2	0	4	0	0	0	0	61
San Antonio	1	0	1	0	0	5	0	0	0	0	63
MOUNTAIN											
Montana:											
Billings	0	1	0	0	0	0	0	0	0	2	6
Great Falls	2	----	1	----	----	----	0	----	----	----	----
Helena	0	0	0	0	0	0	0	0	0	0	2
Missoula	0	0	0	0	0	0	0	0	0	0	4
Idaho:											
Boise	0	0	0	0	0	1	0	0	0	0	2
Colorado:											
Denver	13	12	0	0	0	3	0	0	0	26	94
Pueblo	2	0	0	0	0	1	0	1	0	16	12
New Mexico:											
Albuquerque	0	0	0	0	0	7	0	0	0	3	13
Arizona:											
Phoenix	1	5	1	0	0	3	0	0	0	0	----
Utah:											
Salt Lake City	3	2	1	0	0	2	0	0	0	41	29
Nevada:											
Reno	0	0	0	0	0	0	0	0	0	0	----
PACIFIC											
Washington:											
Seattle	9	10	2	3	----	----	0	0	----	33	----
Spokane	7	5	7	4	----	----	0	0	----	4	----
Tacoma	2	7	4	0	0	2	0	0	0	5	27
Oregon:											
Portland	5	1	10	1	0	3	0	0	1	0	71
Salem	0	0	0	0	0	0	0	0	0	1	----
California:											
Los Angeles	39	20	4	1	0	26	1	0	0	7	233
Sacramento	3	1	0	0	0	3	0	1	0	5	30
San Francisco	23	4	1	0	0	9	1	0	0	22	151

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases estimated expectancy	Cases	Deaths
NEW ENGLAND									
Massachusetts:									
Boston	2	0	0	0	0	0	0	0	0
MIDDLE ATLANTIC									
New York:									
New York	13	11	3	0	0	0	1	0	0
New Jersey:									
Camden	0	1	0	0	0	0	0	0	0
Newark	1	0	0	0	0	0	0	0	0
Pennsylvania:									
Philadelphia	5	5	1	0	1	1	0	0	0
Pittsburg	0	1	0	1	0	0	0	0	0

City reports for week ended April 4, 1931—Continued

Division, State, and city	Meningococcus meningitis		Lethargic encephalitis		Pellagra		Poliomyelitis (infantile paralysis)		
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases estimated expectancy	Cases	Deaths
EAST NORTH CENTRAL									
Ohio:									
Cincinnati	1	0	0	0	0	0	0	0	0
Indiana:									
Indianapolis	3	4	0	0	0	0	0	0	0
Illinois:									
Chicago	16	6	0	0	0	0	0	0	0
Michigan:									
Detroit	8	5	0	0	0	0	0	0	0
Wisconsin:									
Milwaukee	1	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
Minneapolis	0	0	0	0	0	0	0	1	0
Missouri:									
Kansas City	2	2	0	0	0	1	0	0	0
St. Louis	5	5	1	0	0	0	0	0	0
SOUTH ATLANTIC									
Maryland:									
Baltimore	2	0	0	1	0	0	0	0	0
District of Columbia:									
Washington	4	2	0	0	0	0	1	0	0
Virginia:									
Richmond	0	0	0	1	0	0	0	0	0
Roanoke	0	0	0	0	0	1	0	0	0
West Virginia:									
Charleston	1	0	0	0	0	0	0	0	0
North Carolina:									
Raleigh	0	0	0	0	0	1	0	0	0
Winston-Salem	0	1	0	0	1	2	0	0	0
South Carolina:									
Charleston	0	0	0	0	7	0	0	0	0
Columbia	1	0	0	0	0	0	0	0	0
Georgia:									
Atlanta	2	1	0	0	1	1	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	7	1	0	0	0	0	0	0	0
Nashville	1	1	0	0	0	0	0	0	0
Alabama:									
Birmingham	5	2	0	0	0	0	0	0	0
Mobile	0	0	0	0	0	1	0	0	0
Montgomery	0	0	0	0	4	0	0	0	0
WEST SOUTH CENTRAL									
Louisiana:									
New Orleans	2	1	0	0	0	0	0	0	0
Shreveport	0	0	0	0	0	1	0	0	0
Texas:									
Dallas	0	0	0	0	1	0	0	0	0
Houston	0	0	0	0	0	1	0	0	0
San Antonio	0	1	0	0	0	0	0	0	0
PACIFIC									
Washington:									
Seattle	1	0	0	0	0	0	0	0	0
California:									
Los Angeles	2	2	0	0	0	0	0	0	0
Sacramento	1	0	0	0	0	0	0	0	0
San Francisco	0	0	0	0	0	1	0	0	0

The following tables give the rates per 100,000 population for 98 cities for the 5-week period ended April 4, 1931, compared with those for a like period ended April 5, 1930. The population figures used in computing the rates are estimated mid-year populations for 1930 and 1931, respectively, derived from the 1930 census. The 98 cities reporting cases have an estimated aggregate population of more than 33,000,000. The 91 cities reporting deaths have more than 31,500,000 estimated population.

Summary of weekly reports from cities March 1 to April 4, 1931—Annual rates per 100,000 population, compared with rates for the corresponding period of 1930 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	Mar. 7, 1931	Mar. 8, 1930	Mar. 14, 1931	Mar. 15, 1930	Mar. 21, 1931	Mar. 22, 1930	Mar. 28, 1931	Mar. 29, 1930	Apr. 4, 1931	Apr. 5, 1930
98 cities	73	88	65	101	[2] 65	97	78	82	[3] 53	79
New England	106	92	79	92	67	65	70	56	46	68
Middle Atlantic	61	85	67	94	64	97	63	80	48	74
East North Central	75	94	72	134	[4] 73	132	82	114	[4] 65	107
West North Central	71	118	63	110	73	74	163	64	42	52
South Atlantic	93	78	53	104	73	90	61	70	47	64
East South Central	29	36	35	24	[5] 8	36	76	48	29	30
West South Central	118	143	68	111	71	136	64	125	85	139
Mountain	61	88	26	26	[6] 19	88	87	44	[7] 46	26
Pacific	63	38	55	63	51	45	69	34	53	51

MEASLES CASE RATES

98 cities	769	620	946	646	[2] 1,027	776	1,208	879	[3] 1,126	1,004
New England	909	593	1,346	743	1,527	1,030	1,479	1,117	1,106	1,449
Middle Atlantic	874	417	1,026	396	1,158	539	1,321	611	1,250	789
East North Central	369	442	583	471	[4] 566	538	723	654	[4] 736	799
West North Central	643	938	595	781	492	994	650	908	532	860
South Atlantic	2,238	535	2,753	481	3,442	617	3,879	697	3,808	867
East South Central	1,036	717	1,146	634	[5] 1,073	1,291	1,635	968	1,501	526
West South Central	68	505	37	617	51	547	47	784	88	731
Mountain	1,332	2,106	1,462	2,449	[6] 219	2,890	1,140	2,987	[7] 696	4,731
Pacific	347	1,581	356	1,881	394	1,800	519	2,184	358	2,008

SCARLET FEVER CASE RATES

98 cities	345	321	375	337	[2] 385	316	402	308	[3] 371	301
New England	527	431	589	426	676	372	697	363	577	462
Middle Atlantic	359	283	389	327	392	294	454	299	404	293
East North Central	346	448	399	461	[4] 400	418	378	383	[4] 380	377
West North Central	492	345	518	308	589	335	580	306	585	271
South Atlantic	354	206	310	210	342	286	310	272	290	276
East South Central	401	173	477	96	[5] 231	179	559	233	396	143
West South Central	71	139	95	167	101	108	78	111	95	157
Mountain	305	300	400	379	[6] 323	352	209	458	[7] 137	238
Pacific	121	241	96	229	110	202	104	204	92	168

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are extimates as of July 1, 1931 and 1930, respectively.
[2] South Bend, Ind., Memphis, Tenn., and Pueblo, Colo., not included.
[3] South Bend, Ind., and Great Falls, Mont., not included
[4] South Bend, Ind., not included.
[5] Memphis, Tenn., not included.
[6] Pueblo, Colo., not included.
[7] Great Falls, Mont., not included.

Summary of weekly reports from cities March 1 to April 4, 1931—Annual rates per 100,000 population, compared with rates for the corresponding period of 1930—Continued

SMALLPOX CASE RATES

	Week ended—									
	Mar. 7, 1931	Mar. 8, 1930	Mar. 14, 1931	Mar. 15, 1930	Mar. 21, 1931	Mar. 22, 1930	Mar. 28, 1931	Mar. 29, 1930	Apr. 4, 1931	Apr. 5, 1930
98 cities	13	25	19	25	[2] 21	24	17	22	[2] 13	23
New England	0	2	0	0	0	0	0	2	0	0
Middle Atlantic	0	0	0	0	0	0	0	0	0	0
East North Central	15	24	9	30	[4] 8	20	7	17	[4] 8	30
West North Central	57	79	132	70	130	97	99	99	78	87
South Atlantic	0	2	0	4	0	2	4	8	2	2
East South Central	23	18	0	24	[5] 8	6	12	18	12	0
West South Central	47	63	61	24	95	49	78	45	71	17
Mountain	17	9	17	9	[6] 10	35	44	26	[7] 0	106
Pacific	12	105	41	115	43	103	22	71	16	71

TYPHOID FEVER CASE RATES

98 cities	4	8	3	6	[2] 4	8	4	8	[2] 4	4
New England	5	2	0	5	2	0	2	2	2	5
Middle Atlantic	3	4	2	5	2	6	2	15	3	3
East North Central	1	2	2	1	[4] 2	1	2	3	[4] 1	2
West North Central	11	8	0	4	8	10	2	4	4	2
South Atlantic	12	40	6	12	16	14	12	6	14	4
East South Central	17	12	17	24	[5] 0	84	0	30	0	30
West South Central	0	31	14	7	10	10	7	7	10	10
Mountain	0	0	0	53	[6] 0	18	0	0	[7] 9	18
Pacific	2	6	4	10	8	10	10	2	2	6

INFLUENZA DEATH RATES

91 cities	44	16	34	13	[2] 31	15	29	14	[2] 23	13
New England	19	19	36	2	19	2	14	10	2	7
Middle Atlantic	32	13	23	11	23	14	20	10	17	14
East North Central	48	12	28	9	[4] 28	9	25	11	[4] 18	10
West North Central	59	3	50	6	47	12	35	6	12	9
South Atlantic	73	36	57	18	49	28	32	16	39	8
East South Central	139	58	101	84	[5] 130	78	126	97	126	39
West South Central	52	32	55	43	35	25	55	32	69	36
Mountain	44	35	35	18	[6] 38	62	61	53	[7] 27	26
Pacific	34	2	36	2	34	7	41	2	14	0

PNEUMONIA DEATH RATES

91 cities	194	166	191	155	[2] 184	161	180	163	[2] 172	161
New England	185	220	147	169	183	218	156	220	127	181
Middle Atlantic	229	181	214	178	216	159	220	187	223	184
East North Central	160	141	139	127	[4] 132	148	125	117	[4] 121	146
West North Central	218	129	159	144	215	123	171	135	150	117
South Atlantic	265	222	332	196	269	222	263	212	221	196
East South Central	227	214	240	233	[5] 222	188	189	227	170	155
West South Central	148	160	206	142	180	199	211	164	238	164
Mountain	131	150	235	123	[6] 124	194	131	176	[7] 165	185
Pacific	101	75	125	65	101	77	98	92	53	62

[2] South Bend, Ind., Memphis Tenn., and Pueblo, Colo, not included.
[3] South Bend, Ind., and Great Falls, Mont., not included.
[4] South Bend, Ind., not included.
[5] Memphis, Tenn., not included.
[6] Pueblo, Colo., not included.
[7] Great Falls, Mont., not included.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Week ended March 28, 1931.—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the week ended March 28, 1931, as follows:

Province	Cerebro-spinal fever	Influenza	Lethargic encephalitis	Polio-myelitis	Smallpox	Typhoid fever
Prince Edward Island [1]						
Nova Scotia	2	39			1	1
New Brunswick						1
Quebec	1	1		1		19
Ontario	3	7		1	3	3
Manitoba			1			1
Saskatchewan					8	1
Alberta [1]						
British Columbia	1		1			1
Total	7	47	2	2	12	27

[1] No case of any disease included in the table was reported during the week.

New Brunswick—Deaths from communicable diseases—Year ended October 31, 1930.—During the year ended October 31, 1930, deaths from certain communicable diseases were reported in the Province of New Brunswick, Canada, as follows:

Disease	Number of deaths	Death rate per 100,000	Disease	Number of deaths	Death rate per 100,000
Diphtheria	26	6.1	Scarlet fever	14	3.3
Influenza	16	3.7	Tuberculosis	357	84.2
Lethargic encephalitis	1	.2	Typhoid fever	20	4.7
Measles	15	3.5	Whooping cough	31	7.3
Poliomyelitis	3	.7			

Quebec Province—Communicable diseases—Week ended April 4, 1931.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the week ended April 4, 1931, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Mumps	7
Chicken pox	66	Puerperal fever	2
Diphtheria	16	Scarlet fever	61
Erysipelas	8	Tuberculosis	43
German measles	4	Typhoid fever	15
Measles	188	Whooping cough	31

CUBA

Habana—Communicable diseases—March, 1931.—During the month of March, 1931, certain communicable diseases were reported in the city of Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	1	1	Measles	53	
Chicken pox	48		Scarlet fever	5	
Diphtheria	11	1	Tuberculosis	28	2
Malaria [1]	4		Typhoid fever [1]	9	1

[1] Many of these cases are from the island of Cuba, outside of Habana.

DENMARK

Communicable diseases—January, 1931.—During the month of January, 1931, cases of certain communicable diseases were reported in Denmark as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	8	Paratyphoid fever	3
Chicken pox	69	Puerperal fever	19
Diphtheria and croup	482	Scabies	1,089
Erysipelas	298	Scarlet fever	143
German measles	8	Syphilis	152
Influenza	57,309	Tetanus	2
Lethargic encephalitis	8	Typhoid fever	11
Measles	2,161	Undulant fever (Bac. abort. Bang)	49
Mumps	460	Whooping cough	2,207

ITALY

Communicable diseases—Four weeks ended January 25, 1931.—During the four weeks ended January 25, 1931, cases of certain communicable diseases were reported in Italy as follows:

	Dec. 29, 1930–Jan. 4, 1931		Jan. 5–11, 1931		Jan. 12–18, 1931		Jan. 19–25, 1931	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	19	22			12	11	9	9
Cerebrospinal meningitis	9	8	9	9	4	4	11	11
Chicken pox	214	92	286	108	227	96	261	98
Diphtheria and croup	551	300	574	302	620	341	654	374
Dysentery	2	2	2	2	2	2	8	5
Lethargic encephalitis	1	1	6	6	7	7	5	5
Measles	1,274	227	1,419	238	1,272	260	1,998	285
Poliomyelitis	5	5	4	4	4	4	6	6
Scarlet fever	315	128	357	156	363	156	325	143
Typhoid fever	250	171	299	172	265	156	284	165

JAMAICA

Communicable diseases—Four weeks ended March 28, 1931—During the four weeks ended March 28, 1931, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island of Jamaica outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis	1	3	Puerperal fever	----------	2
Chicken pox	5	7	Scarlet fever	2	13
Dysentery	----------	7	Tuberculosis	14	73
Leprosy	----------	3	Typhoid fever	15	41
Lethargic encephalitis	----------	1			

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

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

CHOLERA

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

Place		Sept. 21–Oct. 18, 1930	Oct. 19–Nov. 15, 1930	Nov. 16–Dec. 13, 1930	Dec. 14, 1930–Jan. 10, 1931	Week ended— January, 1931			February, 1931				March, 1931				Apr. 4, 1931
						17	24	31	7	14	21	28	7	14	21	28	
Ceylon: Colombo	C													1			
China:																	
Canton	C	1	1														
Shanghai	C	38	2														
	D	4															
India	C	36,529	18,944	11,112	10,687	3,504	4,022	4,275	3,533	3,529							
	D	17,635	9,782	5,933	5,689	1,770	2,165	2,231	1,957	1,846							
Bombay	C	16	19	13		20	1										1
	D	11	17	7		6	3										
Calcutta	C	24	33	22	28	36	29	24	32	27	33	45	65	80	102	129	
	D	15	16	16	20	25	19	19	23	22	25	26	39	49	68	69	
Karikal	C				1					4		1	4	2	1		
	D									4			4	2	1		
Madras	C	2	1		201	47	36	16		18	20	19	15	4		7	
	D	2			67	21	11	7	8	5	4	14	6	5		2	
Negapatam	D							1	2	1		2					
Rangoon	C	1			1												
	D	1			1	1											
Tuticorin	C	1	1	5	1	1					1						
	D	1	1														
India (French):																	
Chandernagor	C	3	1	1	2			1			1	2	2		2	2	
	D	1			3			1			1	3	1		3	1	
Pondicherry	C	1	1	4	31	9	4	3	3	10	20	31	39	29	25	26	20
	D	1		4	21	3	3	3	2	10	9	6	9	6	5	4	3
India (Portuguese)	C		14		1												
	D		9														
Indo-China (see also table below):																	
Pnompenh	C	2	1	2			1	2	1		3	3	3				
	D			2				2			1	2	2		1		
Saigon and Cholon	C	2	1	3	9	4	1		1			3	1	1		1	
	D			1	4	2	1					3	1	2	1	1	

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

CHOLERA—Continued

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

Place		Sept. 21–Oct. 18, 1930	Oct. 19–Nov. 15, 1930	Nov. 16–Dec. 13, 1930	Dec. 14, 1930–Jan. 10, 1931	Week ended— January, 1931			February, 1931				March, 1931				Apr. 4, 1931
						17	24	31	7	14	21	28	7	14	21	28	
Philippine Islands:[1]																	
Ports—																	
Iloilo	C	1		1	1			2									
	D	4		3	1			2									
Manila	C	5															
	D	1															
Provinces—																	
Antique	C	40															
	D	18															
Bulacan	C	2															
	D	1															
Capiz	C							3	56	69	54	28	35	29	11	4	4
	D							2	45	55	39	23	29	24	10	4	3
Iloilo	C	50	30	45	28	11	41	36	57	27	42	10	16	2	5		
	D	40	23	27	22	9	27	25	49	21	22	11	11	2	2		
Masbate	C													21			
	D													9			
Negros, Occidental	C	28	56	163	120	19	32	33	6	1	1	2					
	D	20	41	123	97	15	17	19	5	1	1	2					
Negros, Oriental	C								1								
	D								1								
Samar	C	7	16	8	17												
	D	7	12	8	9												
Sorsogon	C		5														
	D		4														
Surigao	C	(2)															
Siam	C	4	4	6	2	2		1			1				4	4	2
	D	1	4	6	2	1									1	1	
Ayudhaya District	C																1
Bangkok	C	3	3	4	2	2		1		1			1		1	1	
	D	2	2	4	2	1							1		1	1	
Bismulok Province	C														4	4	
	D														1	1	

Place		August, 1930	September, 1930	October, 1930	November, 1930			December, 1930			January, 1931			February, 1931	
					1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20
Indo-China (French) (see also table above):															
Annam [1]	C	3													
Cambodia [1]	C	59	38	22	8	1	17	28			7	19	36		35
Cochin-China [1]	C	27	33	28	5	5	3	8			7	4	13		5

PLAGUE

Place		Sept. 21–Oct. 18, 1930	Oct. 19–Nov. 15, 1930	Nov. 16–Dec. 13, 1930	Dec. 14, 1930–Jan. 10, 1931	Week ended—											
						January, 1931			February, 1931				March, 1931				April, 1931	
						17	24	31	7	14	21	28	7	14	21	28	4	11
Algeria:																		
Algiers	C	6	11	2	1	1		1		1							1	
	D		8														1	
Bone	C							1										
Constantine, vicinity of	C		1		50			1		1								
	D							1										
Oran	C	10	2															
	D	3	1															
Plague-infected rats		6	1															
Philippeville	C	3	2		1													
	D	1			1													
Argentina:																		
Cordoba Province	C						1				1							
Entre Rios Province—Diamante	C											2						
Jujuy Province—Palpala	C							1			1							
Santa Fe	C										2							
Belgian Congo	C		1	1											2			
	D		1	1											2			

[1] Fugures for cholera in the Philippine Islands are subject to correction.
[2] During the period from Aug. 24 to Sept. 26, 1930, 26 cases of cholera with 17 deaths were reported in Manitum, Surigao Province, P. I.
[3] Reports incomplete.

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

PLAGUE—Continued

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

Place		Sept. 21–Oct. 18, 1930	Oct. 19–Nov. 15, 1930	Nov. 16–Dec. 13, 1930	Dec. 14, 1930–Jan. 10, 1931	Week ended— January, 1931			February, 1931				March, 1931				April, 1931	
						17	24	31	7	14	21	28	7	14	21	28	4	11
British East Africa (see also table below):																		
Tanganyika	C			3	2							15	7					
	D			3	2							4						
Uganda	C	165	171	111	67	7	8	2	8	6								
	D	164	168	112	67	6	8	2	8	6								
Ceylon: Colombo	C	3	1	9	9	1	1	1	5	6	2	1	2	1	3	3		
	D	3	1	8	9		1	1	4	7	2	1	3	1	3	2		
Plague-infected rats	P		1	2				1	1	1	1	1			3	1		
China:																		
Manchuria—Tungliau and Nungan	C	1																
Shensi	C		1															
Dutch East Indies:																		
Batavia and West Java	C	107	143	208	239	56	57	37	30	29	36							
	D	103	140	206	238	54	53	37	24	29	35							
East Java and Madura	C								4									
	D								4									
Java and Madura	D	335	501	557	615	142	102	98	85	89	100	99	80					
Egypt:																		
Alexandria	C	9	7	4	3				1	1			1	1				
	D	6	7	1														
Plague-infected rats	P			3	1		1				1							
Assiout	C		3	9	7	2	19	2	3	9		17	15	6	10	1	1	5
	D		1	1	1	2	2	2		4		3	4		4	1	1	
Aswan	C			3														
Beni-Suef	C					1												
	D					1												
Cairo	C																1	
Deirout	C						19	2		6	10							
	D						2	2			4							
Gharbieh	C							1										
	D							1										
Girga	C				7				1						14	37	35	31
	D				2				1						2	5	17	13
Kena	C															5		
	D															2		

Manfalut	C				23	5	21	4		11		2	2	3	5	9			
	D				5	2	3	1		4		1			2	1			
Minieh	C			1			1	1							2	1			
	D							1							1	1			
Port Said	C		2																
France: Marseille	C	4	4																
Greece (see also table below): Pyrgos	C	2																	
India	C	2,371	2,721	3,259	3,740	1,169	1,279	1,438	1,449	1,270									
	D	1,068	1,497	1,856	2,226	837	737	957	891	862									
Bassein	C		1		2	1		1	2				1						
	D				1	1			2	1									
Bombay	C	2	1				1			1				1	1	1			
	D	2	1				1			1					2	1			
Plague-infected rats		64	30	32	38	10	6	9	9	14		8	10	17	14	21			
Madras Presidency	C	196	185	148	220	73	99	75	65	30	19								
	D	110	124	78	154	47	53	39	43	17	18								
Rangoon	C	2	2		2		2									1			
	D	2	1		1		1									1			
Plague-infected rats		1	1	4	2	2	1	1			8								
India (Portuguese)	C		3																
	D		3																
Indo-China (see also table below):																			
Pnompenh	C	2		6	1	1	3	2	1				1						
	D	3	1	6	1	1	3	2	1		1	2	1	2	1	1			
Saigon and Cholon	C	1																	
Iraq: Baghdad	C	1	P	4			2	3				1	2	1	3	3	1		
	D	1		2			2	2					2		3	1	1		
Madagascar (see also table below): Tamatave	C	1	5	4	2		5	4											
	D	1	3	3															
Morocco	C		5		19	13													
	D				8	4													
Nigeria: Lagos	C	5	38	9	5				1										
	D	5	5	9	5				1										
Plague-infected rats		11	13	5	5														
Peru (see table below).																			
Senegal (see table below).																			
Siam	C	1	6						4	5	9	3	1						
	D		5						2	4	6	4							
Bangkok	C		1	1	3		4	4		1	2	3		29					
	D		1	1	3		4	3	1		1	4		6					
Nagara Rajsima	C	1	1	11	17	3	2	1	3	7									
	D	1	1	9	10	2	3	1	4	6									
Syria: Beirut	C		6		1				1		1								
Tripolitania	C		1	13		2	2	1	3		1			1					
	D			1		2			1										
Tunisia: Tunis	C		1	P	13	1					9	2	3		5				
	D										7								
Union of Socialist Soviet Republics:																			
Gouranduz	D							28											
Transcaucasia—Karabakh	C						6												

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

PLAGUE—Continued

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

Place		Sept. 21–Oct. 18, 1930	Oct. 19–Nov. 15, 1930	Nov. 16–Dec. 13, 1930	Dec. 14, 1930–Jan. 10, 1931	Week ended— January, 1931			February, 1931				March, 1931				April, 1931	
						17	24	31	7	14	21	28	7	14	21	28	4	11
Union of South Africa:																		
Cape Province	C	-------	1	P	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
Orange Free State	C	-------	-------	-------	2	-------	-------	-------	P	P	1	P	-------	-------	-------	-------	-------	-------
	D	-------	-------	-------	2	-------	-------	-------	-------	-------	1	-------	-------	-------	-------	-------	-------	-------
On vessel: S. S. Marionga de Thermiotis at Avonmouth	C	-------	-------	-------	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------

Place		Aug., 1930	Sept., 1930	Oct., 1930	Nov., 1930	Dec., 1930	Jan., 1931
British East Africa (see also table above):							
Kenya	C	87	53	58	62	50	69
Greece (see also table above)	C	-------	-------	2	-------	-------	-------
Indo-China (see also table above)	C	2	5	2	5	1	-------
Madagascar (see also table above):							
Ambositra Province	C	-------	-------	4	44	95	100
	D	-------	-------	4	44	87	96
Antisirabe Province	C	11	21	3	18	27	66
	D	11	21	3	18	26	57
Miarinarivo Province	C	2	7	18	12	18	28
	D	2	7	18	12	18	26
Moramanga Province	C	27	18	20	19	13	7
	D	27	17	20	19	11	5
Tananarive Province	C	39	79	125	170	178	92
	D	38	79	116	164	172	89
Peru	C	21	10	42	34	8	-------
	D	8	2	20	14	-------	-------
Senegal:							
Baol [1]	C	79	48	53	-------	-------	-------
	D	20	23	35	4	-------	-------
Dakar [1]	C	108	3	-------	-------	-------	-------
	D	90	8	-------	-------	-------	-------
Louga [1]	C	75	61	37	10	-------	-------
	D	33	30	25	3	-------	-------
Thies [1]	C	34	12	24	27	2	-------
	D	20	4	15	23	1	-------
Tivaouane [1]	C	110	20	53	31	2	-------
	D	54	14	31	25	1	-------

SMALLPOX

Place		Sept. 21–Oct. 18, 1930	Oct. 19–Nov. 15, 1930	Nov. 16–Dec. 13, 1930	Dec. 14, 1930–Jan. 10, 1931	Week ended— January, 1931			February, 1931				March, 1931				Apr. 4, 1931
						17	24	31	7	14	21	28	7	14	21	28	
Algeria:																	
Algiers	C				1				1		1					2	
Bone	C							1									
Constantine	C		1												1		
Oran	C			3													
Arabia: Aden	C								1	1							
Belgian Congo	C				79	27	23			1							
Belgium	C																
Brazil:																	
Porto Alegre (alastrim)	C	26	28	36			3										
Rio de Janeiro	C		2														
British East Africa (see also table below): Tanganyika	C	95	17	385	84	21	25	18	6	35	42						
	D	6	1	36	4	1	1	2	1		12						
British South Africa: Southern Rhodesia	C	153	95	18	18	2	1										
	D			3													
Canada:																	
Alberta	C	22		1	19		7			1							
British Columbia—Vancouver	C	2	3	1	3				2	1	2	5					
Manitoba	C							1				1					
Winnipeg	C				1							1					
Nova Scotia	C							1								1	
Ontario	C	19	59	23	17	10	3	32	4	10	4	7	8	2	3	3	1
Kingston	C				6	1					1						
North Bay	C				2					1							
Ottawa	C		37	12	2	1	1	1			1						
Sault Ste. Marie	C				1	11	8	5	6			2					
Toronto	C			4										1		1	
Quebec	C			2			2										
Saskatchewan	C	3	2	18		7	6	5	20	17	18	18	10	40	10	8	
Regina	C										1					2	
Canary Islands: Las Palmas	C															1	
China:																	
Canton	C									2			1	1	2	2	
Chungking	C	P	P	P	2												
Foochow	C	P	P	P	P		P		P		P		P				
Hong Kong	C				1		1			2	5		2			1	
	D									1	1	1				2	

[1] Reports incomplete.

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

SMALLPOX—Continued

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

Place		Sept. 21–Oct. 18, 1930	Oct. 19–Nov. 15, 1930	Nov. 16–Dec. 13, 1930	Dec. 14, 1930–Jan. 10, 1931	Week ended— January, 1931			February, 1931				March, 1931				Apr. 4, 1931
						17	24	31	7	14	21	28	7	14	21	28	
China—Continued.																	
Manchuria—																	
Harbin	C		1					1									
Kwantung—Dairen	C			4	1											2	
	D			1													
Nanking	C	P	P	P	P	P		P	P	P	P	P	P				
Shanghai—																	
Foreigners only	C	1	2	8	14	1	1	6	4	4	7	2	3	3	1	1	
Including natives	D		1	4	11	2	4	4	3	5	2	4	3	5	2	2	1
Swatow	D	4	3	3	5	1	1	3	2		3	3	7	3	6	6	
Tientsin	C	1	1	2		1											
Chosen (see table below).																	
Colombia: Cali	D	2		1													
Dutch East Indies:																	
Java—Batavia and West Java	C	14	26	6	4		28		1					1			
	D	4	4	2	2		1		1	1							
Sanggi Islands	C		29														
	D		3														
France (see table below).																	
Great Britain:																	
England and Wales	C	325	372	508	665	187	272	286	213	221	50	247	227	171	219		
Bradford	C	1	1	1	1		1		3		1						
Cardiff	C	1															
Leeds	C	1	2		2												
London	C	20	172	184	161	45	47	33	24	23	16	23	36	26	54		
London and Great Towns	C	52	296	433	560	154	198	194	147	150	186	189	158	117	154		
	D		1	1							1						
Sheffield	C						1	1	1		16	6	10	2	1		
Stoke-on-Trent	C		1				1						1				
Greece (see table below).																	
Honduras:																	
Amapala	C																
Ocotopeque and Gracias districts	C												P[1]				
Puerto Castilla	C				4	7	1		3	3							

India	C	2,822	2,412	3,627	5,623	2,068	2,390	2,477	2,682	2,996							
	D	572	606	874	1,381	497	486	523	739	665							
Bombay	C	1		1	2	2	2	2	1		1	3	2	4	1	4	
	D			1	2			1			1	1	1		1	2	
Calcutta	C	12	9	18	59	28	28	40	47	35	51	83	82	53	69	75	
	D	11	7	11	40	16	22	29	33	26	41	66	55	36	54	50	
Cochin	C	12	25	22	15	5	6	8	10	19		16	24	15	17	14	
	D	1	3	4	1					1		1	1				
Karachi	C			3				2	1			4			3		
	D			1				1	1							2	
Madras	C	19	9	20	4	4	7	3	2	4	1	3	1	6	3	9	
	D	8	2	3							1				2	1	
Moulmein	C						2										
Negapatam	C	14	9	6													
Rangoon	C	2	1	1						2		1	1	1	1	1	
	D		1											1			
Tuticorin	C	1															
Vizagapatam	C	1							1			8		1		1	
	D											2				1	
India (French):																	
Chandernagor	C	3	3		5	3	2	1	3	2		6	6	3	3	6	
	D	1	1		3	1						1					
Karikal	C	1			3	1	2		2	2		16	1			1	
	D	1			2		2		2	2		16					
Pondicherry Province	C	38	11	19	34	16	8	13	8	1	1	10	7	7		4	
	D	36	11	17	32	16	8	13	8	1	1	10	7	7		4	
India (Portuguese)	C				4	1	4			2	3	6	3				
	D									2							
Indo-China (see also table below):																	
Pnompenh	C	2		1	2				1					1			
	D			1					1								
aigon and Cholon	C		2	2		3	1		2		2	2		1		1	
	D		2	2		2			2			1		3	1	2	
Iraq:																	
Baghdad	C	2										3	6				
Mosul Liwa	C	69	6	16	1		2		1		5						
	D	27		2							1						
Ivory Coast (see table below):																	
Japan:																	
Kobe	C											1	1				
Taiwan	C								1								
Mexico (see also table below):																	
Jalisco (State)—Guadalajara	D	3	3	3			1									1	
Juarez	D	1	1														
Mexico City and surrounding territory	C	13	9	6	10					7	5		11	13			
	D	3	2	6	6				1	1	3	2	2	5			
Vera Cruz	C		1							1		1	1		1	1	
Morocco (see table below).																	
Nicaragua: Porto Cabezas	C				2												
Nigeria: Lagos	C															2	
Panama Canal Zone	C							2									
Poland	C		8	3	25						1						

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

SMALLPOX—Continued

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

Place		Sept. 21–Oct. 18, 1930	Oct. 19–Nov. 15, 1930	Nov. 16–Dec. 13, 1930	Dec. 14, 1930–Jan. 10, 1931	Week ended— January, 1931			February, 1931				March, 1931				Apr. 4, 1931
						17	24	31	7	14	21	28	7	14	21	28	
Portugal: Lisbon	C	16	20	37	72	27	31	15	30		12	19	9	16	15	17	
Siam	C	1			1	1	1	1	1	1	1						
Somaliland, British: Boales	C	1	1	1													
	D	1		1	1												
Spain	C		51	67	68			10	8	10	4	10	46	45	15	21	
Straits Settlements	C	5	10	17	6	3	1	2	1			2				2	
	D	1	2	7	3			1				1				1	
Sudan (Anglo-Egyptian)	C	82	5	50	64	1	7		3	1	1	44	51	3	1	4	
	D	7	1	5	6		7					6	4		1	1	
Sudan (French) (see table below).																	
Switzerland: Berne Canton	C	1															
Syria (see table below).																	
Tunisia: Tunis	C	2			17	6	1	1								4	
Turkey (see table below).																	
Union of South Africa:																	
Cape Province	C	P	P	P	P				P								
Orange Free State	C		2	P					P			P					
Transvaal	C	P	P	P	P	P	P	P	P	P	P	P					
Upper Volta	C		1	6	4						8	10					
	D				2												
On vessel:																	
S. S. Clan Mactoggart at Suez	C									2							
S. S. Muncaster Castle at Manila from Hong Kong	C				1												
S. S. Matheran at Suez from Calcutta	C						1										
S. S. Clan Buchanan at Suez	C											2					

Place		August, 1930	September, 1930	October, 1930	November, 1930			December, 1930			January, 1931			February, 1931	
					1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20
Indo-China (see also table above)	C	93	192	258		86		38	9	14		48	46		46
Ivory Coast	C			4		2		9							
Sudan (French)	C	39	P	17				43		96					
	D	3		2				16		4					
Syria: Beirut	C	1										1			

Place		July, 1930	Aug., 1930	Sept., 1930	Oct., 1930	Nov., 1930	Dec., 1930
British East Africa (see also table above):							
Kenya	C	186		424		653	
Chosen	C	65	35	3	22		
	D	21	15	5	6		
France	C	1					
Greece	C	1		6			4
Mexico (see also table above)	D	659	718	822	893		1
Morocco	C	3	8	4	4	20	25
Turkey	C	51	21	19	74		
	D	13	4	2	1		

TYPHUS FEVER

Place		Sept. 21–Oct. 18, 1930	Oct. 19–Nov. 15, 1930	Nov. 16–Dec. 13, 1930	Dec. 14, 1930–Jan. 10, 1931	Week ended—											
						January, 1931			February, 1931				March, 1931				April, 1931
						17	24	31	7	14	21	28	7	14	21	28	4	11
Algeria:																		
Algiers	C		1	2						1	1					3		
Constantine Department	C	2	1	2	6		6	6	19			4			1			
Oran	C	3		5			1	2					1					
Bulgaria	C	6	3	11	3	9	2	1	1		2		3					
	D				1													
Chile: Valparaiso	D														1			
China:																		
Canton	C						2											
Manchuria—Harbin (see also table below)	C	1		1			3											
Shanghai	C						2											
Tientsin	C			1														

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

TYPHUS FEVER—Continued

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

Place		Sept. 21–Oct. 18, 1930	Oct. 19–Nov. 15, 1930	Nov. 16–Dec. 13, 1930	Dec. 14, 1930–Jan. 10, 1931	Week ended— January, 1931			February, 1931				March, 1931				April, 1931	
						17	24	31	7	14	21	28	7	14	21	28	4	11
Chosen (see table below).																		
Czechoslovakia (see table below).																		
Egypt:																		
Alexandria	C	1	2	2														
	D		2															
Beheira Province	C				1													
	D				1													
Cairo	C			1	1				1									
Port Said	C	1	2				1											
Eritrea: Asmara	C													1				
Great Britain: Scotland	C								1									
Glasgow	C							2										
	D							1										
Guatemala.[1]																		
Iraq: Baghdad	C									2	1	1	1	1				
	D									1								
Latvia (see table below).																		
Lithuania (see table below).																		
Mexico (see also table below):																		
Durango	D	2						1										
Mexico City, including municipalities in Federal District	C	8	11	14	12	13	12	6	8	13	13	9		46				
	D	2	4	7	10	8	9	9	8	4	7	5		20				
San Luis Potosi	D			2						2	2		1	1	1	2	1	
Morocco	C		3	1	8		5	6	2	7	8	5	8	2	2	3		
	D	1					2				1							
Palestine	C	3	3	7	4	1	1			3				2	1	1		1
Paraguay: Asuncion	D						2	2										
Poland	C	22	37	42	63	19	21	16	50	49	41	43	56	62	58	85		
	D	2		7	3	2	1	4	1	3	3	4	9	4		7		
Portugal: Oporto	C	2	4	6			1											
Rumania	C	14	41	34	113	54	43	51	45	49	53	12	38					
	D		2	3	5	1	7	6	2	5	11	3	5					
Spain	C	2	4	1														
	D	2		1														

Tunisia:																			
Sbeitla, vicinity of	C																	20	
	D																	7	
Sfax	C																2		
Tunis	C	12		28			7	4	5			6	12	5	2	7			
Turkey (see table below).																			
Union of South Africa:																			
Cape Province	C	P	P	P	P	P	P	P	P	P	P	P							
Municipality of East London	C	1	1	1	3		1	1	1										
Natal	C	2	P		P	P	P	P	P	P	P								
Orange Free State	C		P		P	P	P	P	P	P		P							
Transvaal	C	P	P	P	P	P	P	P	P	P	P	P							
Yugoslavia (see table below).																			

Place		Aug., 1930	Sept., 1930	Oct., 1930	Nov., 1930	Dec., 1930	Jan., 1931
China: Harbin (see also table above)	C	5		3			
Chosen: Seoul	C	2	1	7	1	1	1
Czechoslovakia	C	1			16	16	60
Greece: Athens	C	6	4	4	4	10	10
Latvia	C	1	2				

Place		Aug., 1930	Sept., 1930	Oct., 1930	Nov., 1930	Dec., 1930	Jan., 1931
Lithuania	C	7	24	1	5	6	26
	D	1	2		1	3	3
Mexico (see also table above)	D	26	47	47			
Turkey	C	11		28	3	2	
Yugoslavia	C	2		2	2		20
	D	1		1			2

YELLOW FEVER

	Cases	Deaths
Brazil:		
Bahia State—Mar. 14, 1931	1	
Ceara State—Mar. 14, 1931	2	
Barbalha, Feb. 7, 1931	1	1
Minas Geraes State—		
Mar. 20, 1931	2	
Apr. 5–11, 1931	1	
Rio de Janeiro State—		
Mar. 7, 1931	1	1
Mar. 21, 1931	1	1

	Cases	Deaths
Brazil—Continued.		
Rio de Janeiro State—Continued.		
Cambucy—		
Jan. 1–25, 1931	3	3
Feb. 1–7, 1931	1	1
Friburgo (imported), Jan. 25–30, 1931	1	
Padua—		
Jan. 18–24, 1931	1	1
Feb. 1–7, 1931	1	1
Gold Coast:		
July 10, 1930	1	
Albosso, Aug. 4, 1930		1

[1] On Feb. 27, 1931, the Director General of Public Health of Guatemala reports an unusual outbreak of typhus fever in a small village in Guatemala.