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SICKNESS AMONG MALE INDUSTRIAL EMPLOYEES IN THE FIRST QUARTER OF 1931

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All through the year 1930 a favorable health record was indicated from reports of a group of industrial sick-benefit associations covering about 135,000 male industrial employees.[1] Reports from the same establishments during the first quarter of 1931 showed a continuation of low sickness incidence rates for the more important disease groups with the exception of influenza. In January and February of this year, it will be recalled, a widespread outbreak of influenza occurred. No other important respiratory disease, however, with the possible exception of tuberculosis of the respiratory system, appears to have occurred among these workers as often during the first three months of 1931 as in the same period either of 1930 or 1929. Since influenza and pneumonia generally fluctuate together, the low rate of pneumonia in the first quarter of this year is noteworthy. Declining industrial activity, especially in the iron and steel industry, where an abnormal incidence of pneumonia appears to be associated with certain occupations,[2] may tend to reduce the occurrence of this disease among a group representing the factory payroll of several of the larger industries of the country.

For each one of the nonrespiratory disease groups shown in Table 1, with two exceptions, a lower incidence rate was indicated for the first quarter of 1931 than for the same period of 1930 and 1929. A rather considerable decrease appears to have occurred in the incidence of diseases of the digestive system and in diseases of the skin.

In the year 1921 the frequency of illnesses reported as neurasthenia was 2.5 cases per 1,000 males, a rate which has not been approached since then. On account of the similarity of industrial conditions in 1921 and 1931, and because the medical director of a large industrial establishment has recently noted in the group under his observation an unusual number of cases of nervous indigestion, neurasthenia, and the like, which he attributes to the insecurity of jobs and to financial

[1] *Cf* Sickness Among Industrial Employees in the First Half of 1930. Pub. Health Rep., Vol. 45, No. 43 (Oct. 24, 1930). Also, Sickness Among Industrial Employees in the Second Half of 1930. Pub. Health Rep., Vol. 46, No. 14 (Apr. 3, 1931).

[2] A study of the frequency of pneumonia among iron and steel workers is being published as a Public Health Bulletin by the Public Health Service. Occupations involving exposure to wide changes in temperature were found especially to be associated with an unusual frequency of pneumonia.

worry, the rate of neurasthenia has been shown separately in Table 1. For the first quarter of 1931 there is no indication of any increase in the frequency of this type of illness. The statistics for the remainder of the year, however, may bear watching from this point of view.

TABLE 1.—*Frequency of disability lasting 8 calendar days or longer in the first quarter of 1931 compared with the corresponding quarters of 1930 and 1929*

[Male morbidity experience of 18 industrial establishments which reported their cases to the United States Public Health Service during all three years [1]]

Diseases and disease groups causing disability (numbers in parentheses are disease title numbers from the International List of Causes of Death, third revision, Paris, 1920)	Annual number of disabilities per 1,000 men in—		
	1931	1930	1929
Sickness and nonindustrial injuries	128.2	118.7	181.3
Nonindustrial injuries	10.0	10.9	11.7
Sickness	118.2	107.8	169.6
Respiratory diseases	70.6	51.1	110.1
Influenza and grippe (11)	47.1	23.2	82.1
Bronchitis, acute and chronic (99)	5.9	7.3	7.3
Pneumonia, all forms (100, 101)	3.8	4.8	5.3
Diseases of the pharynx and tonsils (109)	7.5	8.8	8.3
Tuberculosis of the respiratory system (31)	1.1	.9	.9
Other respiratory diseases (97, 98, 102–107)	5.2	6.1	6.2
Nonrespiratory diseases	47.6	56.7	59.5
Diseases of the stomach (111,112)	3.9	5.0	4.6
Diarrhea and enteritis (114)	.7	1.2	.8
Appendicitis (117)	3.5	4.4	4.6
Hernia (118a)	2.1	2.0	2.0
Other digestive diseases (108, 110, 115, 116, 118b–127)	2.5	3.3	3.6
Rheumatic group, total	11.9	13.0	13.9
Rheumatism, acute and chronic (51, 52)	6.0	6.4	6.5
Lumbago and other diseases of the organs of locomotion (158)	3.4	4.1	4.4
Neuralgia, neuritis, sciatica (82)	2.5	2.5	3.0
Neurasthenia (part of 84)	1.4	1.3	1.5
Other diseases of the nervous system (70–81, 83, part of 84)	1.1	1.4	1.3
Diseases of the circulatory and genito-urinary systems (87–96, 128–136)	8.0	9.2	8.6
Diseases of the skin (151–154)	2.9	3.9	4.8
Epidemic and endemic diseases except influenza (1–10, 12–25)	3.1	4.0	6.0
Ill-defined and unknown causes (205)	1.9	2.6	2.0
All other diseases (26–30, 32–37, 41–50, 53–69, 85, 86, 155–157, 159, 164)	4.6	5.4	5.8
Average number of males covered in the records	123,222	134,469	131,117

[1] Except that the rates for 1929 cover 15 of the 18 establishments included in 1930 and 1931.

The record under discussion is based on the frequency of claims for sickness and nonindustrial accident benefits covering cases causing disability for 8 consecutive calendar days or longer. It applies to the employed population only, but includes those working only part time. For persons indefinitely laid off, membership in the benefit association ordinarily is automatically terminated.

Although the morbidity rates presented cover a very small sample of the male wage-earning population of the country, the comparisons include men in the same industrial establishments, so that the population under observation in recent compared with earlier periods is much the same. The establishments included were, with one exception, located north of the Ohio and Potomac Rivers and east of the Mississippi.

A STUDY OF ILLNESS AMONG GRADE SCHOOL CHILDREN

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INTRODUCTION

During recent years there has been a growing interest in the health of school children. Part of this increased interest may be referred to the agitation in favor of health which followed the World War and the publication of the results of physical examinations of drafted men, and part of it is associated with the general development of public health work and the emphasis placed on preventive medical work. Forty-two States have some kind of school medical inspection law, and three States (Pennsylvania, New Hampshire, and Virginia) report the examination of over 90 per cent of the pupils enrolled. Fifteen States have directors of physical and health education, and at least 91 of the 100 largest cities in the United States have directors of school health service.

School health service is concerned not only with the control of communicable diseases but with the sanitary supervision of the school buildings, health education, and medical inspection. Consideration should also be given to such health factors as the length of the school day, the amount of physical education, the number and duration of recess periods, the shape and adjustability of school furniture, and the size of print in school textbooks.

School children (elementary and high school) constitute approximately one-fifth of the total population of the United States, and the health condition of such a large proportion of the people of this country is naturally of interest to health workers. Compulsory attendance during a large part of the school year makes this part of our population a more or less homogeneous group working under similar circumstances for the greater part of each year.

The illness of school children often results in absence from school, although the total absence from school can not be taken as a criterion of the amount of sickness, because of frequent absences due to other causes. However, analysis of absences among school children with attention given to the causes of the absences gives information regarding the health of the school population which is of interest to public-health workers and to educators. The present study is based on such an analysis of absences occurring among New Haven public school children from January, 1927, to the end of the school year of 1927–28 in June.

PREVIOUS STUDIES

The United States Public Health Service initiated school morbidity studies during the school year of 1919–20, when Collins [1] studied absences of 6,130 school children in 13 communities in Missouri. The population of the cities ranged in size from 21,144 to 904, the total population being 84,029. The data were entered by the teachers on cards, one card for each child, showing sex, color, and age, total possible and total actual number of days of school attendance, and days lost on account of sickness and for other reasons. It was found that 6.5 per cent of the total possible number of days were lost on account of sickness, the percentage being somewhat higher among girls than boys. The younger age groups showed the largest percentage of days lost from school. Absence due to sickness was lowest at the beginning and end of the school year, the peak of the monthly curve being in February, principally due to the influenza epidemic. Absence due to causes other than sickness remained more constant, and fluctuated within a 2 to 4 per cent range throughout the year. The principal diseases causing absence were reported in 2,326 cases, from which was computed the percentage of days lost for each disease for each month. Aside from influenza, 32.5 per cent of the days lost and 57 per cent of the cases were due to colds, and 23.5 per cent of the days lost and 12 per cent of the cases were due to measles. The heaviest absence rate due to colds occurred in December and January, while the peak of measles absence was in April.

In a further study during the following year, Collins [2] reported on absences among 3,786 school children in four representative communities in Missouri, who had been examined for physical defects. He found consistently smaller rates of absence among the group without defects. The rate of absence from sickness for children with enlarged or diseased tonsils was 12 per cent greater than the nondefect rate, and the rate for children with adenoids and defective tonsils, in addition to other defects, was 31 per cent greater than the nondefect rate. Decayed teeth and defective vision failed to show any consistent effect on absence.

From the standpoint of sex differences these studies showed that at all age groups girls were absent from school because of sickness more than boys, but the latter were absent from causes other than sickness more frequently than girls. Sickness absence decreased with age, but absence from other causes decreased up to 10–11 years and then increased with age.

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[1] Collins, S. D.: Sickness Among School Children. Pub. Health Rep., 36, 1549–69 (1921).

[2] Collins, S. D.: The Relation of Physical Defects to Sickness. Pub. Health Rep. 37, 2183–2193 (1922).

In 1922–23, Harmon [3] conducted a study of absenteeism among white and negro school children in two Cleveland schools with a total of 918 white and 693 negro children. An attendance record card was kept by the teacher for each child, which showed identification, personal data, and absences. All absences of two days' duration or over were reported to the department of attendance and investigated by its officers as to cause, nature of illness, and medical attendant, if any. Checks on all 2-day absences were made at intervals to insure accuracy. These studies showed that 7.9 per cent of the total days of school were lost by the white and 7.4 per cent by the negro children. For sickness of two days or over, the per cent of absence was 3.6 and 2.1 per cent among the white and negro children, respectively. For causes other than sickness, the respective percentages were 0.4 and 07, while for causes not determined the percentages were 1.5 and 1.7. The peak of the absences occurred for both groups in February, except that a second peak occurred among the negro children in April, due to an epidemic of measles. In both groups absences were greater among females than among males. The ages 5 to 9 years showed a larger percentage of total absence and absence due to sickness for both males and females than the age group 10–14. The respiratory diseases were responsible for the greatest number of absences; 47.2 per cent of all days lost among the white children and 41 per cent among the negro children were due to these causes. Measles ranked next, with 13 and 18.2 per cent, respectively. Scarlet fever caused longer absences than any other disease, followed by measles and chicken pox.

A comprehensive analysis of school absenteeism was made by Collins [4] in connection with the Hagerstown morbidity studies. During the last six months of the 1921–22 school year and the school years 1922–23 and 1923–24 a record was kept of each child, showing the absences on account of sickness, the cause of the illness, and the number of days of absence, together with other data regarding sex, age, and race. In all, 3,712 white children were included in the 1921–22 data and 5,126 in those of 1922–23. Rates were computed per 1,000 children per full-time school year (180 days), both for number of cases and for days lost on account of sickness, as well as the number of school days lost per case of sickness and the percentage of the total possible days of attendance which were lost on account of sickness. As age increased, the case rates and days lost per child decreased, the latter decreases being more marked. Absences were higher for

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[3] Harmon, G. E., and Whitman, G. E.: Absenteeism Among White and Negro School Children in Cleveland, 1922-23. Pub. Health Rep., 39, 559-567 (1924).

Harmon, G. E., and Whitman, G. E.: Absenteeism because of Sickness in Certain Schools in Cleveland, 1922-23. Pub. Health Rep., 39, 1359-1366 (1924).

[4] Collins, S. D.: Morbidity Among School Children in Hagerstown, Md Pub. Health Rep., 39, 2391-2422 (1924).

girls than for boys, although severity, as measured by the number of days lost per case of illness, was practically the same for each sex. Colds were the most common cause of sickness, both in case frequency of illness and in days lost per child, while whooping cough, scarlet fever, pneumonia, diphtheria and measles, in the order named, were of longest duration per case. Seasonal variations varied, being highest in March, 1922, and February, 1923, chiefly due to the cases of colds and influenza occurring during those months.

In a school health study of Newton, Mass., conducted by the Metropolitan Life Insurance Co.,[5] the number and causes of absence were recorded through the school period November, 1926–May, 1927. For each month from 24 to 38 per cent of the elementary school children were absent on account of illness for a mean of two to three days each. In February 23.4 per cent of the elementary school population were reported absent on account of colds, with a mean absence of 3.5 days. Of these children, 35 per cent were 10 per cent or more below average standard weight. During the same month 3.6 per cent were absent from contagious diseases.[5]

Smith [6] reported on absences in a Brookline (Mass.) boys' school during three school years 1917–1920. Absence percentages due to illness in these years were 11.62, 9.76, and 12.77 per cent, respectively. Of absences due to illness, 54, 54, and 40 per cent, respectively, were caused by respiratory infections. A study of possible infection by contact indicated that respiratory infections are commonly distributed among boys who are near together.

During the school years 1919–20, 1920–21, and 1921–22, studies of absences in St. Paul's School at Concord, N. H., were made, which have been reported by Sanford.[7] The per cent of days lost were 4.26, 3.15, and 3.25 for the respective years, the percentages due to respiratory diseases being 2.27, 0.91, and 2.39, respectively. The maximum seasonal absence due to illness took place in February in all three years.

THE PRESENT STUDY

The present study was undertaken in order to secure information regarding school absenteeism in New Haven,[8] Conn., a city of somewhat larger population than that of any previous study, except Cleveland. It was made possible through a ruling of the New Haven Department of Health, which barred the return to school of pupils absent

[5] A school health study of Newton, Mass. Monograph No. 5, School Health Bureau, Welfare Division, Metropolitan Life Insurance Co., pp. 70–72, 1927.

[6] Smith, R. M.: Respiratory infections in school children. Trans. Am. Pediatric Soc., 33, 275–285, (1921).

[7] Sanford, C. H.: The causes of absences in a boys' school. Am. J. Dis. Children, 25, 297–301, (1923).

[8] New Haven had a population, estimated from the 1920 and 1930 censuses of 162,621 in 1927 and of 162,632 in 1928. According to the 1920 census (at which time the population was 162,537), 97.1 per cent of the population was white and 2.8 per cent colored. The 1920 census recorded a school attendance of 26,689 out of a total population of 39,504 between the ages of 7 and 20 years.

three or more school days in succession until they secured permission from some representative of the health department, i. e., a school nurse, school physician, or city epidemiologist. For the purposes of the present study, a special perforated card was used, upon which the health worker interviewing the pupil could record on one half the necessary permission for the child's return to school and on the other half the data pertinent to the case of absenteeism. The latter half of the card was kept by the health department for the purpose of this study and contained the name of the school, grade, age at last birthday, sex, color, the date the absence began, the date of permit to return to school, the cause of absence, and the source of the information. The causes of absence were divided into "illness" and "other than illness," and the latter was further divided into "out of town," "illness in family," "lack of shoes," and similar items, "delinquency," "laboratory cultures taken," and "other." Under source of information, "department of health," "visiting nurse," "physician," "parent," "teacher," or "pupil" could be checked.

The study was undertaken in January, 1927, upon the opening of school after the Christmas recess, and was carried through to the end of the next school year, i. e., through June, 1928. Information was thus obtained for nearly six months of the 1926–27 school year and for the full school year of 1927–28. For the purposes of this paper, however, the date prepared and studied were those of the one complete school year, 1927–28, except for an analysis of absences by weeks and for certain other items of special interest.

CLASSIFICATION OF CAUSES OF ABSENCE

The cause of absence was recorded by the health worker. In some cases the cause of absence was ascertained from parents during a home visit by a school nurse. In other cases an examination was made by the school physician or the city epidemiologist. Frequently the opinion of the health worker was based on information given by the pupil.

The causes of absence were classified according to 17 divisions, as follows:

(1) Colds, including cases of grippe under one week in duration.

(2) Sore throat, tonsillitis, laryngitis, and adenoid and tonsil operations.

(3) Other respiratory diseases. This division includes pneumonia, bronchitis, tuberculosis, and grippe.

(4) Diphtheria.

(5) Chicken pox.

(6) Measles.

(7) Mumps.

(8) Whooping cough.

(9) Scarlet fever.

(10) Disease and disorder of the eye.

(11) Earache and ear disease.

(12) Toothache and disease of the teeth.

(13) Digestive disease and disorder.

(14) Skin disease.

(15) Accidents, injuries, and abrasions.

(16) Miscellaneous sickness, covering diseases of small incidence and diseases not listed above, such as typhoid fever, rheumatism, kidney trouble, and headache.

(17) Absence due to nonsickness.

The absence duration was obtained by a simple subtraction of the date of the first day of absence from the date on which the pupil returned to school. By this method, holidays, Saturdays, and Sundays are included. For this reason the duration of absence per case is longer than that in those studies in which the duration of absence included only school days. The duration of absence per case was also influenced by the elimination of absences of 1 and 2 days, as only absences of 3 or more successive school days were recorded. No record was obtained of sickness which occurred during vacation periods, unless such sickness resulted in absences immediately prior to or just subsequent to the vacation. The records, however, have the advantage of having been checked by a physician or nurse and are of special value because of the analysis by diseases.

CAUSES OF SICKNESS

For the school year 1927–28, 16,382 cases of absence of three or more days' duration were recorded. Of this number, 15,468, or 94.4 per cent, were due to sickness, which is the equivalent of 246.5 cases per 1,000 pupils per 100 days. Absences for causes other than sickness of the pupil were 914 in number, or 5.6 per cent of the total absences. These included absences due to sickness of some other member of the family, out-of-town visits, death within the family, or simple delinquency.

The 15,468 absences due to sickness resulted in 212,076 days of sickness, an average of 13.7 days per case. Since the case duration included Saturdays, Sundays, and holidays, this figure does not represent the actual days lost in school. The exclusion of many actual cases because of the 3-day absence criterion also has a tendency to lengthen the average days per case.

CASES AND DAYS OF SICKNESS BY CAUSES

As shown in Table 1, the common cold ranks first among the causes of sickness among school children, with 37.4 per cent of the total cases of sickness. The group, diseases of the throat and tonsils, is next, with 12.7 per cent. Mumps and measles closely follow, with 11.1 per cent and 10.2 per cent, respectively. With respect to the percentage of the total duration of sickness, colds again lead with 24.3 per cent of the total days of sickness. Measles ranks next with 15.4 per cent. Mumps and whooping cough each account for 12.1 per cent. Whooping cough, important from the standpoint of total loss of time from school, is relatively unimportant as a cause of case incidence, since the disease is responsible for only 3.4 per cent of the total cases. With this exception, the major causes are also those causing the greater loss of time from school.

TABLE 1.—*Percentages of total cases and total days of sickness for each cause, New Haven, Conn., 1927–28* [1]

Cause of sickness	Per cent of total days of sickness	Per cent of total cases of sickness
Colds	24.3	37.4
Diseases of throat and tonsils	8.3	12.7
Other respiratory diseases	6.3	3.7
Diphtheria	1.2	.7
Chicken pox	2.8	2.2
Measles	15.4	10.2
Mumps	12.1	11.1
Whooping cough	12.1	3.4
Scarlet fever	.6	.3
Diseases and disorders of the eye	.6	1.0
Earache and ear disease	1.9	1.8
Toothache and diseases of teeth	.8	1.3
Digestive disease and disorders	2.7	2.9
Skin disease	1.6	1.6
Accidents, injuries, and abrasions	2.5	2.5
Miscellaneous sickness	6.8	7.3
All sickness	100.0	100.0
All respiratory diseases	38.9	53.8
All special communicable diseases of childhood	44.2	27.9

[1] The data presented in all tables are based on cases lasting 3 school days or longer.

Besides colds, diseases of the throat and tonsils, measles, and mumps only one other group, miscellaneous sickness, causes more than 5 per cent of the total cases. The remainder vary from 3.7 per cent for "other respiratory diseases" to 0.3 per cent for scarlet fever. The same group of causes, with the addition of whooping cough and "other respiratory diseases," also causes 5 per cent or more each of the total days of sickness, the remainder varying from 2.8 per cent in the case of chicken pox to 0.6 per cent for scarlet fever and disease and disorders of the eye.

The respiratory group as a whole caused more than half the total absences because of sickness and nearly 40 per cent of the total days lost. The specific communicable diseases of childhood, diphtheria, measles, mumps, chicken pox, whooping cough, and scarlet fever make up over one-fourth of the cases and 44 per cent of the days of sickness.

AVERAGE DURATION PER CASE

Table 2, giving the number of cases and days of each cause of sickness, shows that whooping cough has the longest duration per case, 49.3 days, while scarlet fever follows with 31.7 days. Other respiratory diseases, diphtheria, measles, and chicken pox follow, in the

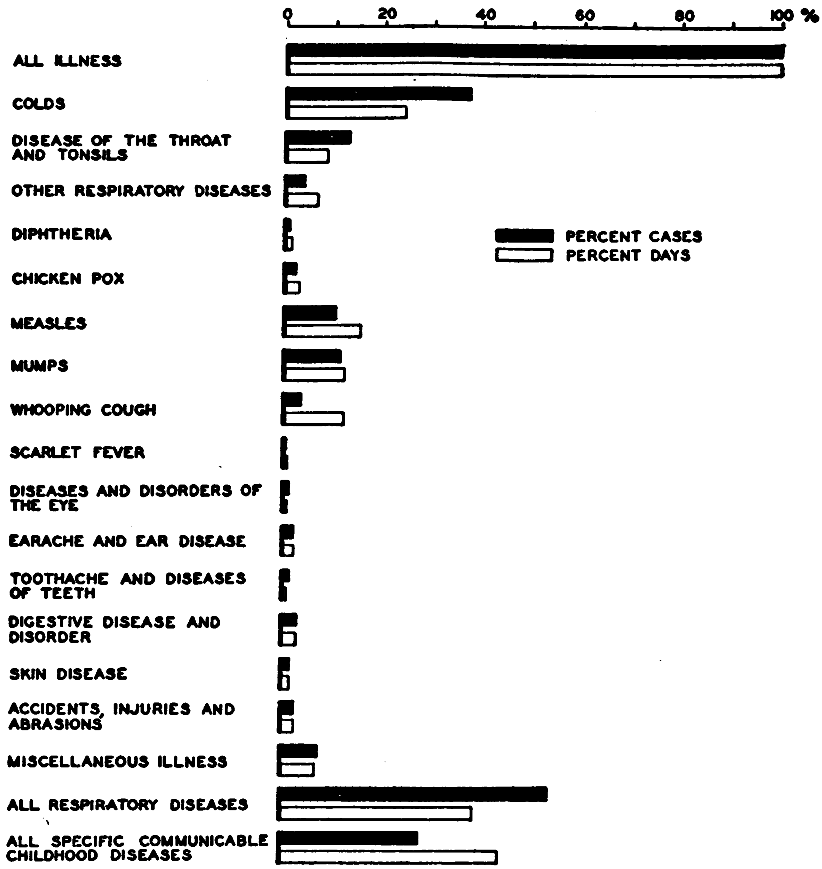

FIGURE 1.—Percentage of total cases and total days of sickness for each cause, New Haven, Conn., 1927–28. (The data in all figures are based on cases lasting three school days or longer)

order named, with 23.7, 21.9, 20.8, and 17.4 average days per case, respectively. Each of these causes was reponsible for only a very small percentage of the total number of cases.

TABLE 2.—*Number of cases and days of sickness by cause of sickness, New Haven, Conn., 1927–28*

Cause of sickness	Number of cases	Number of calendar days of sickness	Calendar days of sickness per case
Colds	5,783	51,636	8.9
Disease of throat and tonsils	1,956	17,618	9.0
Other respiratory diseases	566	13,415	23.7
Diphtheria	114	2,492	21.9
Chicken pox	340	5,905	17.4
Measles	1,570	32,683	20.8
Mumps	1,723	25,551	14.8
Whooping cough	519	25,589	49.3
Scarlet fever	43	1,363	31.7
Disease and disorder of the eye	159	1,343	8.5
Earache and ear disease	276	3,943	14.3
Toothache and disease of teeth	204	1,644	8.1
Digestive disease and disorder	446	5,697	12.8
Skin disease	248	3,436	13.9
Accidents, injuries, and abrasions	386	5,271	13.7
Miscellaneous sickness	1,135	14,490	12.8
All sickness	15,468	212,076	13.7
All respiratory sickness	8,305	82,669	10.0
All specific communicable diseases of childhood	4,309	93,583	21.7
All absences	16,382	224,577	13.7

On the whole, a fairly clear tendency is shown for the average durations per case to group themselves into rough periods of 1, 2, or 3 weeks. This appears to be due to the parental custom of allowing the child to stay home an extra day to make a full week, instead of sending him to school on Friday. Also, those children who became sick on Saturday and Sunday, and did not return until the Monday of the week following, were doubtless recorded as being sick only seven days, since the period of absence from school was a week.

Recognizing this tendency, then, one can understand an average of 7 weeks' absence per case of whooping cough, of 4 weeks for scarlet fever, and 3 weeks for "other respiratory diseases," diphtheria, and measles. Chicken pox showed an average of about two and one-half weeks per case (17.4 days). Causes which resulted in general in absences of two weeks were mumps, earache and ear disease, digestive disease and disorder, skin disease, accidents, injuries and abrasions, and miscellaneous sickness. Colds, disease of the throat and tonsils, disease and disorder of the eye, and dental problems each showed an average duration per case of over a week.

The relative seriousness of different types of respiratory tract diseases is shown by the differences in the average duration per case of colds and diseases of the throat and tonsils, as compared with other respiratory diseases. The first two causes were of 8.9 days' and 9.0 days' average duration, while absences due to other respiratory diseases were nearly three times as long (23.7). Some of this difference may be explained by the fact that most people refer to an upper respiratory tract infection of short duration as a cold, but one of long duration as grippe. The latter is included in the group of "other respiratory diseases." A significant part of the difference, however, is due to the fact that the more severe cases of respiratory tract infections, such as pneumonia, are also classed as "other respiratory diseases." The broader classification of "all respiratory diseases" has an average duration of 10.0 days. The above defined groups of specific communicable childhood diseases has an average duration of 21.7 days, or practically 12 days longer.

AGE VARIATION

In order to study the relation of age with respect to causes of absences and their duration, two calculations were made. The average number of days' duration per case of sickness was computed for each year of age, and the case rate for each cause of sickness also was computed for each single year of life. The case rate used was that given by the formula

$$\text{Case rate} = \frac{\text{No. of cases} \times 100{,}000}{\text{No. of pupils} \times \text{No. of school days}}$$

and is expressed as the case rate per 1,000 pupils per 100 school days or per 100,000 pupil-days.

Although ages 5 to 20 were tabulated separately in this study, the figures for age 19 and 20 are of no statistical value because of the small number of pupils in these age groups, and consequently are not used.

TABLE 3.—*Average duration per case by age groups, New Haven, Conn., 1927–28*

Age (years)	All causes (calendar days)	All causes of sickness (calendar days)	All causes of sickness except the S. C. C. D.[1] (calendar days)	Age (years)	All causes (calendar days)	All causes of sickness (calendar days)	All causes of sickness except the S. C. C. D.[1] (calendar days)
5 and under	19.2	19.2	13.9	12	10.4	10.2	9.3
6	15.9	16.0	11.7	13	10.3	10.1	9.6
7	14.7	14.7	10.9	14	9.9	9.9	9.5
8	12.9	12.9	10.2	15	9.7	9.7	9.3
9	12.2	12.0	10.1	16	8.8	8.8	8.5
10	11.0	10.9	9.5	17	8.5	8.5	8.0
11	10.4	10.2	9.3	18	8.2	8.3	8.3

[1] Specific communicable childhood diseases.

Table 3 shows that the greatest number of days' duration per case of sickness occurred in the younger age groups, a definite decrease taking place until at age 18 the duration per case of sickness, 8.3 days, was less than half that, 19.2 days, for the age group 5 and under. The duration per case among the younger age groups is influenced by the occurrence during those ages of the specific communicable diseases of childhood, i. e., measles, mumps, whooping cough, chicken pox, diphtheria, and scarlet fever. Since these diseases cause sickness of comparatively long duration, their occurrence during the younger ages tends to make the average duration of sickness per case among those ages higher than the average duration per case among the older groups.

However, the differences observed are not due entirely to the greater incidence of the so-called childhood diseases in the younger age groups. Column 4 of Table 3 shows that when the effect of these diseases is removed, the younger age groups still show the greater incidence of sickness. A part of the age difference may be due to the fact that young children and girls are kept at home more frequently by parents than is customary for other groups. The average duration

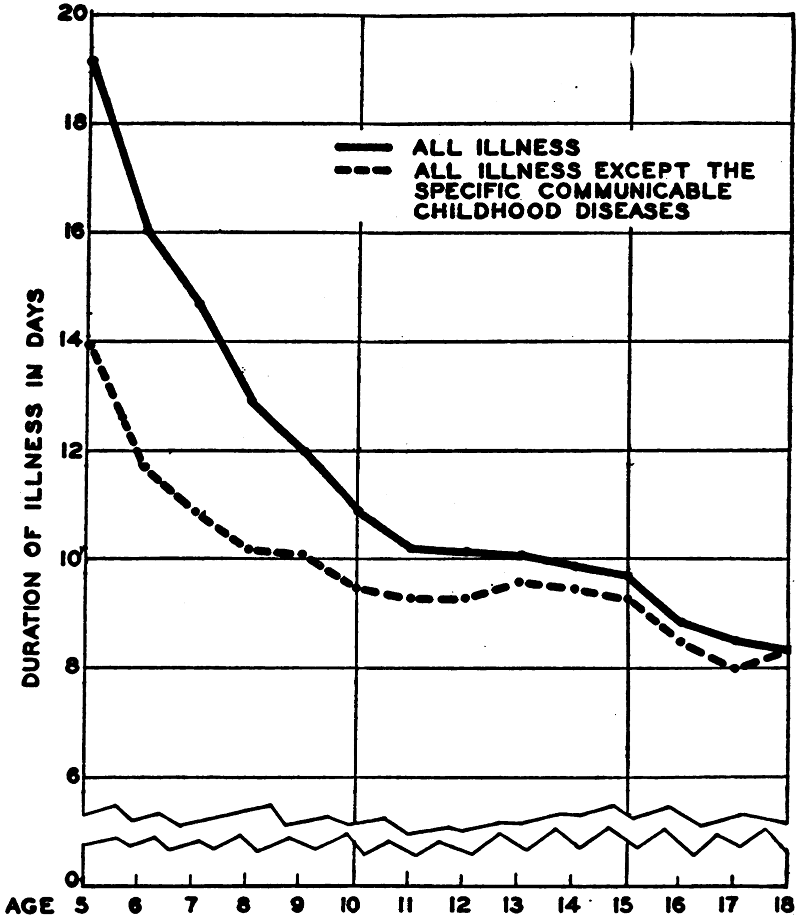

FIGURE 2.—Average calendar days' duration per case of illness at different ages in New Haven, Conn., 1927–28

per case of sickness, excluding the specific communicable diseases, is, for the age group 5 and under, 13.9; for age 18 it is 8.3. Figure 2 depicts in graphic form the data shown in Table 3 and shows the decline in the average length of illness to be rapid for the younger age groups, the differences becoming gradually smaller with increasing age groups.

The case rates for each cause of sickness by sex are given in Table 4.

Table 4.—*Cases of sickness, by cause, per 100,000 pupil days, New Haven, Conn., 1927–28*

Cause of sickness	Case rates per 100,000 pupil days		
	Male	Female	Total
Colds	83.2	101.8	92.1
Diseases of throat and tonsils	26.8	35.9	31.2
Other respiratory diseases	9.3	8.7	9.0
Diphtheria	1.9	1.7	1.8
Chicken pox	5.1	5.8	5.4
Measles	23.4	26.7	25.0
Mumps	27.8	27.1	27.5
Whooping cough	7.9	8.7	8.3
Scarlet fever	.5	.9	.7
Diseases and disorders of the eye	2.4	2.7	2.5
Earache and ear disease	3.9	4.9	4.4
Toothache and disease of the teeth	2.7	3.8	3.3
Digestive diseases and disorders	6.5	7.7	7.1
Skin disease	4.1	3.8	4.0
Accidents, injuries, and abrasions	7.1	5.1	6.2
Miscellaneous sickness	16.8	19.4	18.1
Total sickness	229.4	264.7	246.6
Special communicable diseases of childhood	66.6	70.8	68.6
Total sickness less special communicable diseases of childhood	162.9	193.9	177.8
Nonsickness	12.6	16.7	14.6
Total	242.1	281.4	261.0

Table 5 shows by age and sex the case rates of sickness from all causes.

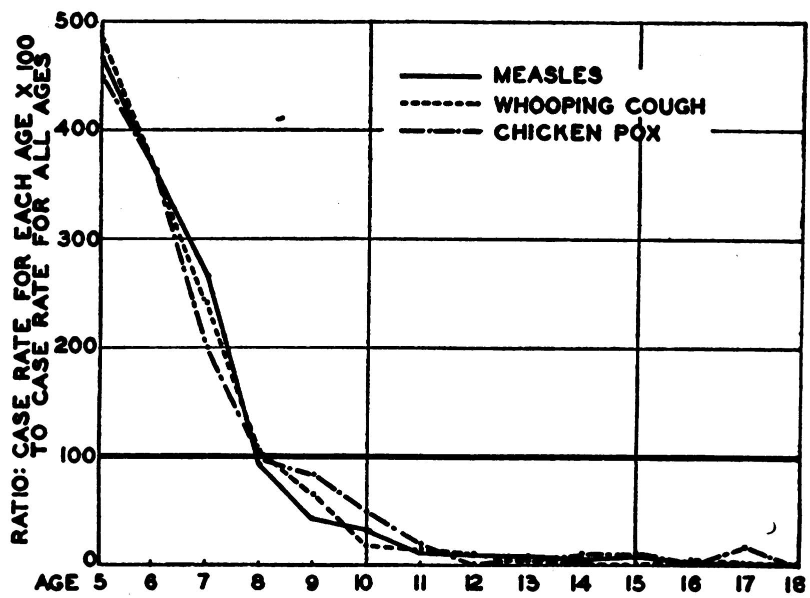

Figure 3.—Relative age incidence of certain diseases among school children in New Haven, Conn., 1927–28

In order to facilitate comparison of the age curves of the various causes of illness, the case rates at each age have been expressed as a

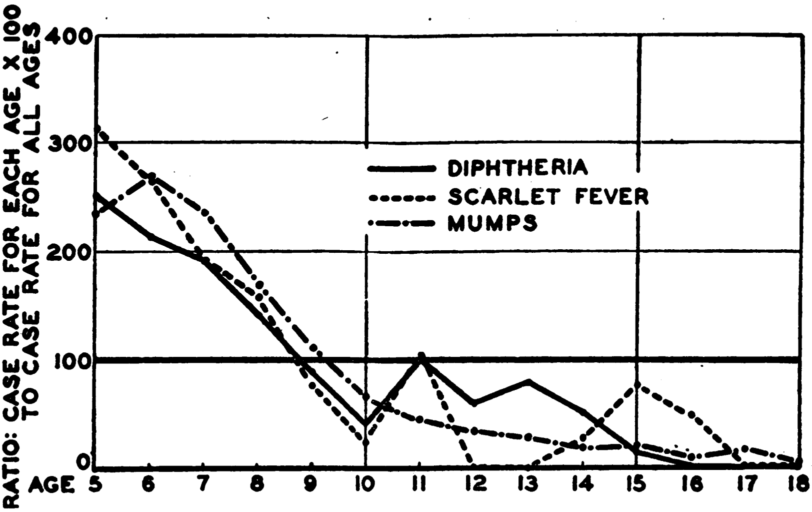

FIGURE 4.—Relative age incidence of certain diseases among school children in New Haven, Conn., 1927–28

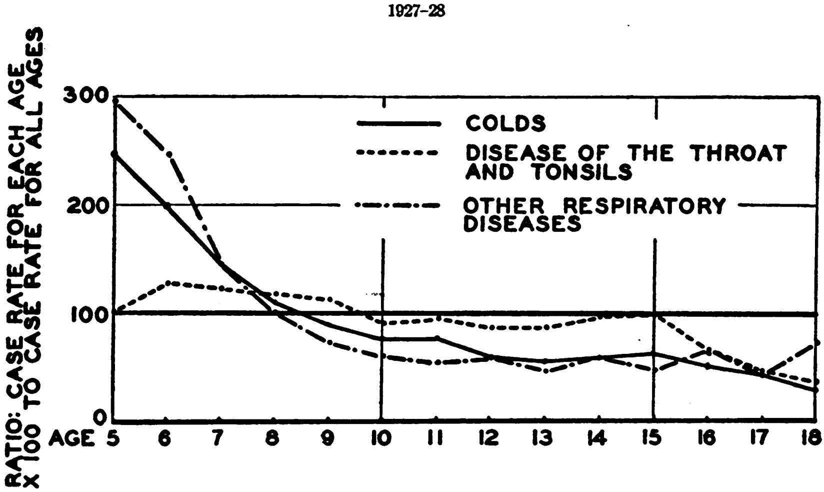

FIGURE 5.—Relative age incidence of certain diseases among school children in New Haven, Conn., 1927–28

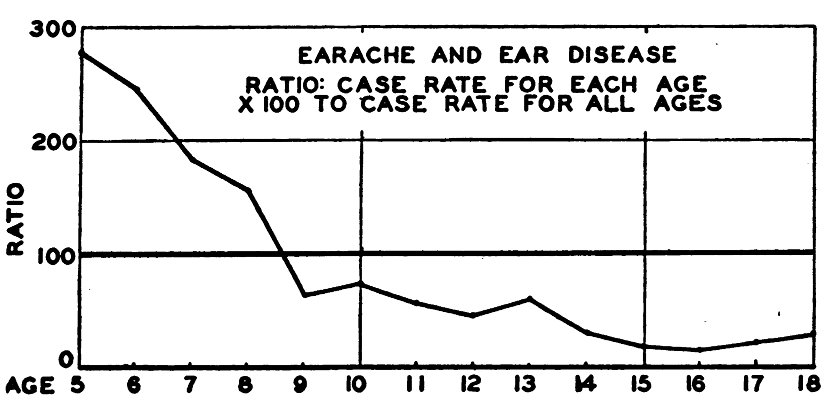

FIGURE 6.—Relative age incidence of earache and ear disease among school children in New Haven, Conn., 1927–28

percentage of the rate for all ages. The series of data thus obtained permits discussion of the relative variations in case incidence with

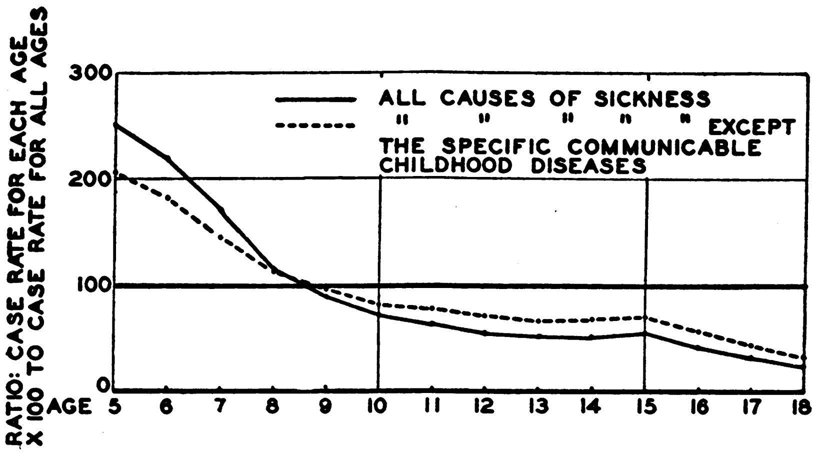

FIGURE 7.—Relative age incidence of certain diseases among school children in New Haven, Conn., 1927–28

respect to age. Graphs of these by cause of sickness are shown by Figures 3 to 7.

TABLE 5.—*Case rates of sickness due to all causes, by age and sex, New Haven, Conn., 1927–28*

Age (years)	Cases per 100,000 pupil days			Age (years)	Cases per 100,000 pupil days		
	Boys	Girls	Total		Boys	Girls	Total
5 and under	601.1	638.5	619.5	14	122.5	136.9	129.4
6	511.8	577.8	543.9	15	141.4	132.7	137.2
7	395.7	456.8	424.8	16	88.6	120.5	103.7
8	278.1	297.3	287.7	17	83.8	86.5	85.0
9	197.5	253.6	225.1	18	67.0	55.7	61.9
10	153.8	203.1	177.5	19	56.9	44.1	50.7
11	141.4	177.8	160.3	20 and over	34.2	662.0	159.3
12	127.6	154.0	140.4				
13	118.2	143.6	130.6	All ages	229.4	264.7	246.6

The general trend of all the curves is, roughly speaking, the same, and shows a gradual decrease from an initially high level with increasing age. The specific communicable diseases, whooping cough, measles, mumps, diphtheria, chicken pox, and scarlet fever, show the highest percentages among the young age groups, and the most rapid decline to a very low level, in most cases to practically zero. With the exception of scarlet fever and diphtheria, the so-called childhood diseases become a negligible factor in school absenteeism in New Haven after the eleventh or twelfth year. The decline in diphtheria is somewhat slower, but the curve has practically reached zero by the sixteenth year of age. The curve for scarlet fever shows a greater fluctuation, but on the whole indicates a situation similar to that of diphtheria.

The curves for the respiratory groups are somewhat different. The incidence at the older age groups, though low, is still, in the case of colds and other respiratory diseases, close to 50 per cent. of the rate for all ages. The curve for diseases of the throat and tonsils is more flat, the incidence for this cause being fairly constant throughout the age groups.

A word might be said about the age incidence of certain other causes not shown in the graphs. The incidence of earache and ear disease, disease and disorder of the eye, of skin disease, and of digestive disease and disorder decreases as age increases. The situation is somewhat different for the curve for toothache and disease of the teeth, a second peak occurring at the age groups 15–16, indicating effects of tooth decay and neglect. The age incidence for accidents declines, but the decline is slow after the first school-age group is past, until the age groups 16–18.

The general curves for sickness due to all causes, and for all causes except the childhood diseases, are the same, and exhibit the general characteristics outlined in the curves just discussed, being high at the earliest age group and descending with a steadily decreasing rate to the older age groups.

SEX DIFFERENCES

Table 4 and Figure 8 give the case rates for boys and girls by cause of absence. The total incidence rate of absence, as well as of absence due merely to sickness, is greater among the girls, 281.4 and 264.7, respectively, than among the boys, 242.1 and 229.4, respectively. This difference is also shown for the so-called childhood diseases, the rate being 193.9 for girls and 162.9 for boys. The boys have a greater rate of absence than girls for the following causes: Other respiratory diseases, mumps, skin disease, and accidents, injuries, and abrasions. Although the difference is slight except for the last named, the accident rate for boys is 7.1, as against 5.1 for girls. With respect to the other classified causes, in which the girls lead, a variation in differences exists. The female rate for colds is 101.8 per 100,000 school days, as against 83.2 for the male rate; that of diseases of the throat and tonsils for females is 35.9, as compared with 26.8 for males. The measles rate is 26.7 for females, 23.4 for males; whooping cough, 8.7 for girls, 7.9 for boys. Scarlet fever shows a female rate of 0.9, almost twice as high as that for males, which is 0.5, although the number of absences from this cause is small (16 male cases, 27 female) and this difference may well be due to chance. The female rate for the specific communicable diseases of childhood, 70.8, is larger than that of 66.6 for males.

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TABLE 6.—*Average duration in days of sickness among New Haven school children of all ages*

Cause of sickness	Calendar days of sickness per case		
	Boys	Girls	Both sexes
Colds	8.9	9.0	8.9
Disease of throat and tonsils	9.2	8.8	9.0
Other respiratory diseases	22.3	25.4	23.7
Diphtheria	22.9	20.5	21.9
Chicken pox	17.6	17.2	17.4
Measles	21.3	20.4	20.8
Mumps	15.1	14.5	14.8
Whooping cough	48.2	50.4	49.3
Scarlet fever	31.5	31.8	1.7
Disease and disorder of the eye	8.7	8.2	8.5
Earache and ear disease	15.0	13.7	14.3
Toothache and disease of the teeth	8.1	8.0	8.1
Digestive disease and disorder	13.2	12.4	12.8
Skin disease	12.9	15.0	13.9
Accidents, injuries, and abrasions	14.2	12.8	13.7
Miscellaneous sickness	13.5	12.1	12.8
All sickness	14.0	13.5	13.7

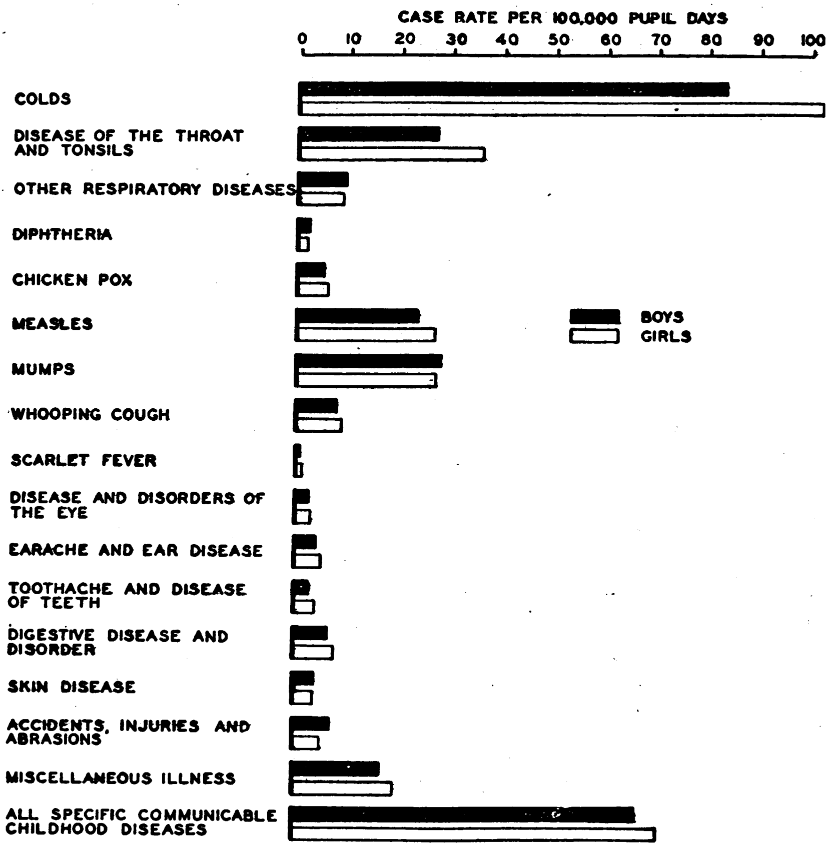

FIGURE 8.—Incidence of illness from various causes among boys and girls of New Haven, Conn., 1927–28

The case rates of sickness due to all causes, by age and sex, are given in Table 5. In each age group except three the rates for girls are consistently higher than those for boys. The 15-year age group shows a rate for girls of 132.7, for boys, 141.4; the 18-year age group rates are 55.7 and 67 for girls and boys, respectively, and for 19 years, 44.1 and 56.9. The differences in the latter age groups are not significant in view of the small numbers involved.

The average number of days of sickness per case for the various causes, as shown in Table 6, shows no consistent sex differences. Of the 16 causes listed, only 7 show a difference of duration between the sexes over one day in length; of these, other respiratory diseases showed an average female duration of 3.1 days greater than the corresponding male rate; whooping cough among females lasted on the average 2.2 days longer than among the males, and for skin disease the female duration was 2.1 days longer. The male average duration for diphtheria was 22.9 days, or 2.4 days greater than for females.

In considering the average duration of sickness by ages, as shown in Table 7, it is found that only 5 age groups have differences on the basis of sex of more than 1 day, and 2 of these are ages 19 and 20 and over, which involve only a few cases of illness.

TABLE 7.—*Average duration per case of sickness by age groups, New Haven, Conn.*

Age (years)	Average number of calendar days of sickness per case			Age (years)	Average number of calendar days of sickness per case		
	Boys	Girls	Both sexes		Boys	Girls	Both sexes
5 and under	19.5	18.8	19.2	14	10.4	9.5	9.9
6	15.9	16.0	16.0	15	10.4	8.9	9.7
7	15.4	14.1	14.7	16	8.5	9.0	8.8
8	13.0	12.8	12.9	17	8.6	8.5	8.5
9	12.3	11.8	12.0	18	8.2	8.5	8.3
10	10.9	11.0	10.9	19	11.8	9.0	11.0
11	10.2	10.1	10.2	20 and over	7.0	5.8	6.0
12	10.0	10.3	10.2				
13	10.1	10.1	10.1	All ages	14.0	13.5	13.7

The 7-year male duration is 15.4 days per case of sickness, or 1.3 days greater than the corresponding figure for females. At age 14 the male duration is 10.4 days, the female, 9.5; at age 15 the male figure is also 10.4 days, that for females, 8.9. Aside from these, the sex and age differences are too slight to be of value in indicating any marked sex differences as regards length of illness.

WEEKLY VARIATION IN SICKNESS

As an expression of the weekly amount of absenteeism, weekly case rates have been calculated, using the formula,

$$\frac{\text{Weekly number of cases} \times 100 \times 1{,}000}{\text{School population} \times \text{number of days in week}} = \frac{\text{case rate per 100,000}}{\text{pupil-days}}$$

Since a considerable variation occurs in the absenteeism curves for the spring of 1927 and 1928, both are presented here. The school population for the curve January–June, 1927, is that for the year 1926–27, or 32,830; for the curve September–June, 1927–28, the school population for that school year has been utilized, or 33,032. Some weeks contain less than the usual number of five school days. For these the rates are calculated on the basis of the actual number of days of school in the week concerned. Since the spring vacation of one week in both seasons has, of course, resulted in only a few sickness absences being recorded for that week, with subsequent low rates, they have been excluded from all the curves.

The Christmas recess ended in both years of this study on January 3. The first week of school in January, 1927, consisted of five days, and in January, 1928, of four days. These weeks are counted as

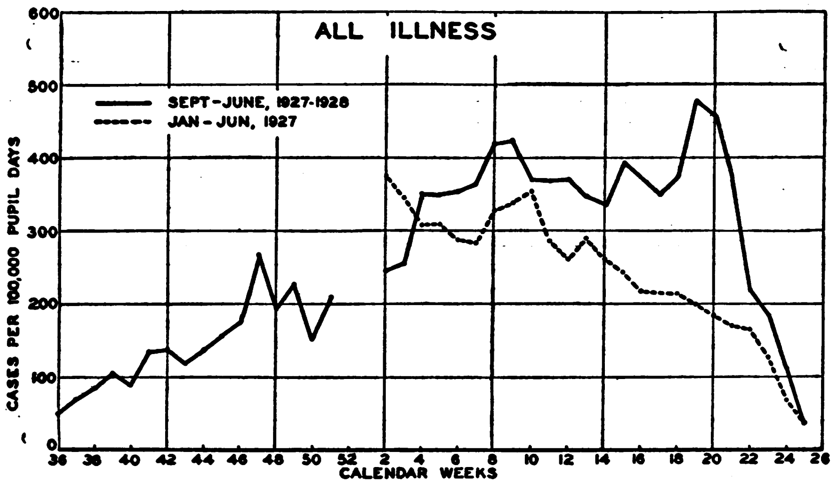

FIGURE 9.—Weekly incidence of illness among New Haven school children, January, 1927–June, 1928

the second week of the year, so that the rates of each season may be directly comparable.

The graph in Figure 9 shows the seasonal trend of all sickness. A gradual rise occurs in the fall of 1927, which apparently continues through the Christmas vacation into the late spring. The peak of 478.0 per 100,000 pupil-days is reached in the nineteenth calendar week (May 6–12) and then rapidly falls as the termination of school approaches. The latter drop is by no means a true indication of the sickness among school children. It is markedly affected by the fact that once school had ended, no further records of sickness could be obtained, since the readmission of the child to school was necessary before the data could be obtained.

The comparison of the curves for January–June, 1928, with the curve for the same period in 1927 is interesting. In the last-named year the peak was highest in the first week of school, following the

Christmas recess, and, with the exception of a small rise during the tenth calendar week (March 4–10), declined slowly and gradually to the end of the school year.

A curve for all causes is similar to that for sickness, while the curve for nonsickness shows only small variations of little significance.

The graph in Figure 10 shows the weekly variation in absences due to colds. As in the case of "all sickness," the curve rises during the autumn months and reaches an initial maximum shortly after the turn of the year. After a stationary period of about 11 weeks (January 22–April 14), the curve rises rapidly to a peak in the twentieth calendar week (May 13–19) to 295.7 cases per 100,000 pupil days. The rate continued high during a period of three weeks during which there were

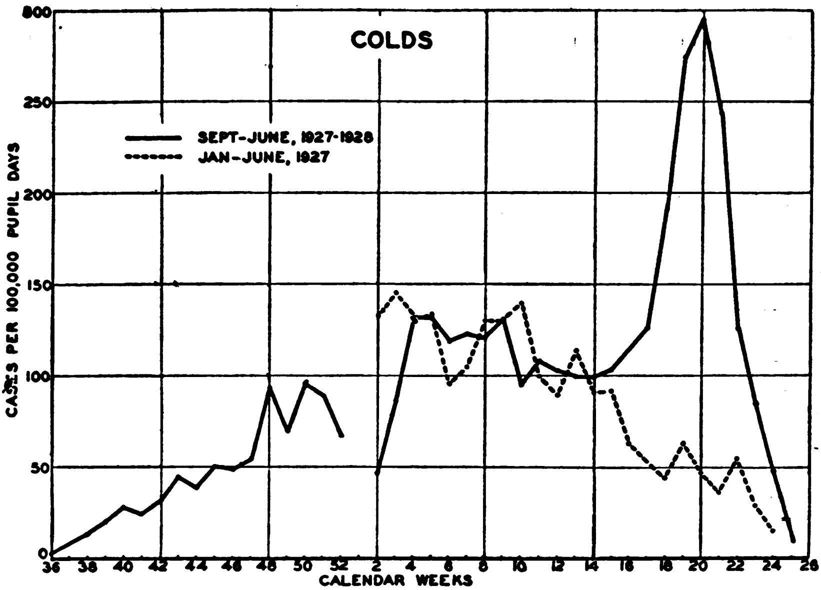

FIGURE 10.—Weekly incidence of colds among New Haven school children, January, 1927–June, 1928

more than twice as many cases as for any similar period during the school year, or in January-June, 1927. The curve rapidly drops after the twentieth week, but again, as in the case of the curve for all sickness, part of this rapid fall is due to the ending of school and may not give a reliable picture. In contrast to this curve, that for the preceding spring shows no May peak, but only a gradual decline after the maximum in March. It is to be noted that the late and enormous increase in the number of colds in 1928 accounts for the differences in the "all sickness" curves. Harmon and Whitman [9] in their study of absenteeism among Cleveland school children, found that the peak of disease incidence occurred in February. Dorothy

[9] Loc. cit.

Phipps,[10] studying absenteeism in the Chicago Normal School, found a greater per cent of absences in February and March than in any other months of the year.

It is evident that there was a considerable epidemic of respiratory conditions in New Haven in the early part of May, 1928. This peak of colds coincides very closely with the peak of mortality in a group of cities in the United States during this minor influenza epidemic. So far as mortality is concerned, this epidemic is exceptionally mild in all places, but the small excess death rate that occurred was somewhat greater in New Haven than in the majority of other cities.[11] The data here given indicate that this epidemic of the

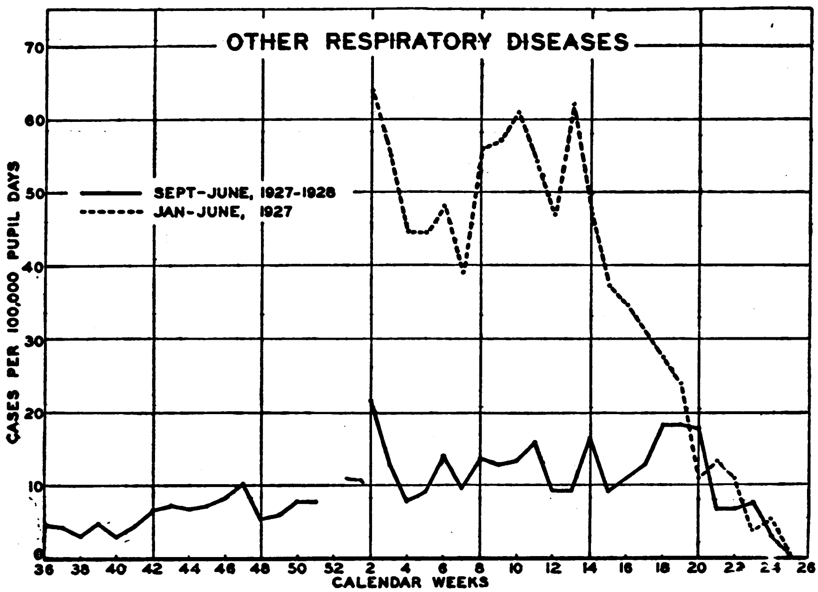

FIGURE 11.—Weekly incidence of respiratory diseases other than colds and diseases of the throat and tonsils among New Haven school children, January, 1927–June, 1928

spring of 1928 was much more important as measured in terms of morbidity than in terms of mortality.

The 1928 curves for sore throat and for "other respiratory diseases" are unlike the curve for colds. The curve for the first-named condition rises slowly in the fall and remains fairly constant through the late winter and spring, no sudden rise in May occurring. The January–June curve for 1927 is about the same, except that it lies slightly but consistently above that for 1928. The curve for "other respiratory diseases" (fig. 11) shows the fall rise, a peak apparently during the Christmas recess, and a constant level between 10 and 15 until

[10] Phipps, D. V. P.; A Study of Absenteeism Among Students of the Chicago Normal College. J. Prev. Med., 3, 31–36 (1925).

[11] Collins, Selwyn D., Frost, W. H., Gover, Mary, and Sydenstricker, Edgar: Mortality from Influenza and Pneumonia in 50 Large Cities of the United States, 1910–1929. Pub. Health Rep., 45, 2277–2328 (1930).

the eighteenth to twentieth weeks, when another rise occurs to 18 cases per 100,000 pupil-days. This rise, however, is fairly small, and can not compare in magnitude nor suddenness of onset to that for colds. The winter-spring curve for 1928, however, is much lower than the similar one for 1927, which apparently established a high level during or previous to the Christmas vacation and maintained it until April, when a rapid decline occurred.

The curves for the specific communicable diseases of childhood, chicken pox, measles, mumps, whooping cough, and scarlet fever, are similar in that a consistent rise occurs during the fall months. The curves during the period January–June, however, show different pictures. Chicken pox shows a small decline in January and February, followed by a rise in April, with a subsequent decline to the end of the school year. In contrast to this, the 1927 curve showed a considerably larger peak in February. Measles maintained a high level of incidence in the winter and early spring, with a consistent decline in the late spring. The 1927 spring curve, in comparison, is negligible. The peak for mumps occurred in March and April, showing a rapid rise in January and February and as rapid a decline in May and June. The 1927 curve is much less, the case rate rising above 10 only once, whereas the 1928 curve showed a rate less than 10 only during the last two weeks of school, the peak of the curve being 92.5. Whooping cough incidence fluctuated during the winter and spring of 1928, declining to zero from the fifteenth calendar week tc the end of the year. The 1927 whooping-cough rate was negligible in comparison. The scarlet-fever curve throughout the year remained low and fairly consistent, and is noteworthy only in the respect that the 1928 curve showed but slight variation from that for 1927.

On the whole, the incidence of the so-called communicable diseases in New Haven was much greater during the winter and spring of 1928 than for the same period in 1927. It would then seem inadvisable to draw wide-sweeping conclusions regarding the seasonal distribution of these diseases among school children from the curve for one season alone.

The curves of incidence of eye diseases, diseases of the ear, and toothache and diseases of the teeth ran a low and irregular course throughout both winter-spring intervals, which are, however, higher than during the fall season. Only once does the curve for disease of the eye rise above 10 cases per 100,000 school days, and for the curve of disease of the ear the January–June, 1927, curve rises above 10 once, and that for January–June, 1928, twice. In contrast to the low incidence, during the fall, of causes just mentioned, digestive disorders and disease of the skin are practically uniform in incidence throughout the year. The curve for skin disease during the January–June, 1928, period is consistently lower than that for the preceding year. The curve for accidents, injuries, and abrasions shows irregular fluctuations throughout the period studied, but the course of this curve is fairly regular.

SUMMARY AND CONCLUSIONS

Records were obtained of all absences of three or more successive school days which occurred among pupils attending the New Haven public schools during the school year 1927–28. These absences were classified according to cause, and case rates were computed for single age groups and for each sex.

A total of 16,382 cases of absence of three or more days' duration were recorded. Of this number, 15,468, or 94.4 per cent, were due to sickness. This number of cases resulted in a total of 212,076 days of sickness—an average of 13.7 days per case. The case rate for sickness was 246.5 per 100,000 pupil-days.

The most common causes of sickness were, in order of importance, colds, disease of the throat and tonsils, mumps, measles, and miscellaneous sickness.

From the point of view of the per cent of the days lost due to each cause of sickness, the important causes were colds, measles, mumps, whooping cough, and disease of the throat and tonsils.

The great importance of respiratory tract disease in causing sickness among school children is shown by the fact that 53.8 per cent of all the cases of sickness and 38.9 per cent of the total days of sickness were due to respiratory disease (classified under "colds," "disease of the throat and tonsils," and "other respiratory disease").

The specific communicable diseases of childhood caused 27.9 per cent of the cases and 44.2 per cent of the total number of days of sickness.

The average number of days of sickness per case was greatest for whooping cough, followed in importance by the other communicable childhood diseases. There was an average of 49.3 days of sickness for each case of whooping cough. For scarlet fever the average duration per case was 31.7 days; for "other respiratory disease," 23.7 days; for diphtheria, 21.9 days; for measles, 20.5 days; and for chicken pox, 17.4 days.

The average number of days of sickness was greatest for the 5-year-age group and decreased as age increased. The decrease was rapid in the younger age groups and slow in the older age groups. The specific communicable diseases of childhood occurred chiefly in the younger age groups. These diseases caused sickness of comparatively long duration and were responsible for a portion of the differences between the age groups in the average number of days of sickness per case. However, when the specific communicable diseases were excluded, there was still a definitely greater number of days of sickness per case in the younger age groups.

The case rate for absence due to sickness among girls was 264.7 per 100,000 pupil-days, as compared with a case rate of 229.4 for boys. Girls showed a higher case rate than boys for the so-called childhood diseases, the rates being, respectively, 70.8 and 66.6. Boys showed a higher rate of absence than girls for the following causes: Other respiratory disease, mumps, skin disease, and accidents, injuries, and abrasions.

The average number of days of sickness per case showed no consistent sex differences.

THE FUMIGATION OF LOADED SHIPS

By C. L. Williams, *Surgeon, United States Public Health Service*

On first consideration the fumigation of loaded ships would appear to present two major problems: How to get the gas in and how to get it out. Practical experience, however, has shown that accessible parts of loaded vessels will clear rapidly, quite as rapidly in fact as empty ships, so that, except for a few details of clearing, the only real problem presented is how to get the gas in. Methods used in introducing the fumigant constitute the only material difference between the fumigation of loaded ships and the fumigation of empty ships. Fumigation of the superstructure is, of course, the same whether the ship is empty or loaded; therefore, in this paper principal consideration will be given to the fumigation of the holds and other cargo spaces.

THE OBJECTS OF LOADED FUMIGATIONS

The reasons for fumigating a ship while loaded are as follows:

1. To kill the rats before the ship goes to dock.
2. To kill rats that may be harboring in the cargo.
3. At a plague-infected or suspected port, to kill rats that may have gone aboard, or may have been carried aboard in cargo, before the vessel leaves port.
4. To secure a sample of rats for examination in the laboratory to determine the presence or probable absence of infection. Absence of infection among the rats secured may be taken as presumptive evidence that all rats on the ship are free of infection.

EFFECTIVENESS

Data available to date indicate that a carefully carried out fumigation of a loaded ship will usually kill 80 per cent of the rats on board. Due to the fact that certain portions of loaded holds can not always be directly reached for purposes of fumigation, the variations of individual effectiveness are likely to be somewhat greater than in empty vessels. In most cases this occurs when the principal rat harborage is at the bottom of the holds. Gas may be introduced into the bilges through the sounding pipes, but its diffusion can not be controlled.

On loaded ships the effectiveness of fumigation is more dependent upon the thoroughness and care with which the work is done than on empty vessels. A longer time is required, because there are more locations into which gas must be directly introduced.

When effectiveness is 80 per cent, greater protection to the port is afforded by a loaded fumigation, before the vessel goes to dock, than would be secured by 100 per cent effectiveness of a fumigation performed after unloading at dock. Vessels arriving loaded generally stay in port about 10 days, 5 to unload and 5 to reload. A simple arithmetical computation proves the above contention in such a case. For example, premising the presence of 100 rats, if 80 are killed before the ship goes to dock, the port will be exposed in 10 days to 200 rat days; whereas, if it goes to dock and remains there 5 days before fumigation, the port is exposed to 500 rat days.

CONSTRUCTION OF HOLDS

Detailed consideration of ship construction is reserved for another paper; certain features, however, are of direct concern in carrying out fumigation in the presence of cargo.

In most ships the holds are on two or more levels, separated by decks. When the upper levels are loaded, the lower ones are, of course, inaccessible except through the ventilators. Many cargo vessels have two levels in the forward and aft holds, with a third level, due to the bridge, or shelter deck, over the midship hold. In some ships the shelter deck extends over three holds and in others it runs the full length of the ship. It is usual to find the shelter deck without intermediate steel bulkheads, but with wooden bulkheads forward and aft of the bunkers. It is common to find the shelter deck only partly loaded or empty.

Steel bulkheads generally separate the holds below the shelter deck. In small vessels these may be lacking between the two forward and two after holds. In such ships the "'tween deck" may also be omitted. Such simplification of structure greatly simplifies loaded fumigation and increases its effectiveness.

Lower holds are usually undivided spaces, but not infrequently upper levels are partitioned off for storage of special cargo. When these subdivisions can not be readily reached, their fumigation may present considerable difficulty.

It is quite common to find the bottoms of holds (which are generally the steel tops of the ballast or fuel tanks) covered with heavy wooden floors. When these have been laid directly on the tank tops, rats can not harbor under them; but when laid on two inch battens they present extensive harborage which can not be effectively fumigated under cargo.

VENTILATORS

As a rule each hold is ventilated with at least two and sometimes four ventilators. In the great majority of ships these are made up of steel cylinders. The first is attached to the weather deck and opens through it. The next, of smaller diameter, is set in the lower end of the first and attached at the bottom to the "'tween deck," through which it opens. If there is a second "'tween deck," another cylinder of still smaller diameter is set in the second and opens through the next deck. This arrangement is to provide for ventilation of all levels through the same ventilator. It is this arrangement which often provides fumigators with the only means of access to the lower levels.

Another type of ventilator construction not infrequently seen is one in which the upper section passes through the weather deck, under which it enters a rectangular conduit. This conduit passes a variable distance toward the side of the ship ending with a large circular opening in the bottom into which is set a cylinder of lesser diameter leading to the lower deck.

A third arrangement, infrequently seen, is for the ventilator to pass under the weather deck over to the side of the vessel and proceed down between two ribs to the lower levels, with openings in the side for ventilating the different levels. On large vessels the ventilators not infrequently pass straight down, unbroken, except for openings on the side at the various levels.

The first type of ventilator described presents relatively easy access to the different levels for fumigation. The others are difficult to utilize.

Separate ventilators are sometimes provided for the shelter deck. These ventilators do not reach the lower levels. Ventilators to coal bunkers are often plugged on the shelter deck with old bags or canvas. Occasionally bulk grain or similar cargo is poured into the ventilators. Usually it settles out of them, but sometimes plugs them completely.

CARGO

Ships may be loaded with liquid, bulk, or package cargo.

Liquid cargo is always contained in tanks which are sealed with water-tight covers. They are a matter of no concern to the fumigator.

Bulk cargo, such as grain, linseed, loose ore, etc., generally fills the hold completely, except for a small space on top, and closes off the bottom of the hold from spaces above. Bulk cargo that must be protected from the metal walls of the hold, such, for example, as salt hides, does not completely fill the hold, since it is kept away from the sides and bulkheads by wooden sheathing, usually temporary, thus permitting free passage of fumigating gases to the bottom of the hold. Bulk cargo in large lumps presents practically the same conditions as package cargo.

Package cargo is always kept away from the side of the ship by battens that run across the ribs and is often stowed so as not to touch the bulkheads. Always there are interstices between the various pieces. These interstices vary in size; they are the least in grain, or similar material, in sacks, and are the greatest in crated machinery.

All cargo has a surface; that is, it never quite reaches the under side of the deck above. Always there is a space, which varies from 5 or 6 inches to a foot or more. It is the existence of this space that makes effective fumigation of a loaded hold possible.

Any level of a hold may be loaded independently of the levels below it. While it is unusual to find a loaded "'tween deck" or shelter deck over an empty lower hold, the condition does occur, being most often found when a lower hold has been converted into bunker space or when it is built for refrigeration. Such a condition delays clearing, but does not otherwise materially influence the fumigation.

A ship may be fully or partially loaded. When a partial load permits the opening of the hatches on all levels, fumigation is greatly simplified, the fumigant being placed in all levels through the hatches. In a hold fully loaded, or with load on an upper level completely covering the "'tween deck" hatch, the lower level or levels can be reached only through the ventilators. An exception is seen on carefully loaded vessels when air shafts have been left, though the cargo, to the lower levels. These, when present, are nearly always at the hatch corners.

When a ship is carefully loaded, the cargo in the weather-deck hatches is stowed away from the sides of the hatch, leaving a space all around through which the fumigant can be readily introduced into the upper level. Usually, however, one finds the hatch completely filled, when, to reach the space over the cargo, it becomes necessary to remove a few pieces from opposite corners.

Bulk cargo, loaded into the hatch, generally closes it. If it is linseed or grain, it is difficult to clear the corners, as this cargo is mobile and flows back as fast as shoveled out. Fortunately, however, with grain and linseed it is a fairly common practice to put two or three layers of sacked cargo over the bulk. Another common method of stowing bulk grain and linseed is to put it in this form only into the lower hold, the upper levels being stowed in sacks, with a "feeder," full of bulk, in the middle of the hatchway. The function of the feeder is to supply additional bulk to the lower hold as the cargo settles, thus obviating the danger of shifting.

Bulk ore is generally so heavy that it is put in the lower hold, which it seldom fills completely. A few ores are moist and therefore absorb much of the fumigant. Except for this it seldom presents any special fumigation problem.

When bulk cargo seals the weather-deck hatch the fumigant must be introduced to all levels through the ventilators. In all other cases it is generally more satisfactory to clear two hatch corners and fumigate the upper level through these openings, using the ventilators to reach the lower levels.

PREPARATION

It is only in the cargo spaces that preparation for loaded fumigation differs from that for empty fumigation. It can not be too often repeated, however, that the success of any fumigation depends largely upon the care and thoroughness with which rat harborages are located and opened or directly fumigated. Because rat harborages in the loaded holds can not be reached, the fumigators are not therefore excused from searching out and opening all retired and inclosed spaces in the accessible portions of the vessel. Sometimes the only harborages are outside the holds. The writer has in mind one such ship fumigated loaded on four successive voyages, each time rats being secured only in the forepeak. On partially loaded vessels the search for harborages should include all accessible portions of the holds. In this connection it is worth while mentioning specifically the space under fresh-water tanks, which is generally inclosed and not infrequently is the main rat harborage on the vessel. These tanks are nearly always located on the shelter or bridge deck, so that they are often accessible.

In fully loaded holds the rat harborages are generally quite inaccessible. Sometimes it is possible to crawl over the cargo and reach the tops of some pipe casings; but in general only a few can be so reached, and the time consumed in opening these few can usually be better spent in making complete preparation for adequately diffusing the fumigant.

The first procedure in preparing the holds is to inspect them and determine to what extent the hatches may be utilized. The next is to clear two opposite corners of all accessible hatches so that the fumigant can be introduced under the deck. After this the ventilators should be inspected and those best suited for fumigating the lower levels determined. An important point is to learn whether there are any subdivisions of the holds and, if so, clear a way for introducing gas. Sometimes these subdivisions are reached by ventilators; in other cases a hose or tube must be led to them over the cargo. If offset ventilators are found, a way must be cleared to the vertical portion below deck, a tube put through the ventilating opening for that deck and lowered to the next level. Fresh-water tanks should be located, inspected when accessible, and if necessary the sheathing opened or prepared for direct fumigation.

It is undoubtedly easier to fumigate through ventilators after the cowls have been removed, but their removal has certain specific disadvantages. The ventilators are the main routes for clearing fully loaded holds, for which purpose they are many times more effective with the cowls in place. It is a discouraging job for a fumigating crew to replace 6 to 12 heavy cowls. Some cowls can be removed and replaced only by use of a derrick. Since loaded ships are generally fumigated in the stream immediately after arrival, the time required to remove the cowls is often too valuable to be so utilized. Despite all this, the removal of the cowls sometimes simplifies the pouring of Zyklon sufficiently to justify the procedure.

After arranging for the proper introduction of the fumigant to the various levels and subdivisions, the capacities of these levels and subdivisions should be ascertained and the proper dose for each specified. Also the portion of the dose to go down each ventilator and into different levels should be specified. Finally, the sounding pipes to the bilges should be located and opened.

In preparations up to this point the help of the ship's crew should be secured. As soon as ready to start fumigating, however, the crew must be put off and further operations carried on by the fumigating personnel.

AMOUNT OF FUMIGANT AND EXPOSURE

The amount of gas to be used is exactly the same as would be used were the ship being fumigated empty. Exposure in loaded holds should be four hours.

FUMIGATING WITH LIQUID HCN

Liquid hydrocyanic acid is supplied in steel cylinders, each holding 75 pounds. For use it must be put into smaller steel cylinders, designated as applicators, each holding 18 pounds. The liquid is forced from the applicators by air pressure through a rubber tube ending in a spray nozzle. The amount delivered is determined by weighing. The mechanics of the apparatus are simple. The companies supplying liquid HCN supply all apparatus required, with directions for using it.

Equipment for loaded fumigation includes 4 applicators, 2 platform spring scales, capacity each 50 pounds, 4 thirty-foot lengths of tube, 2 fifty-foot lengths of tube, 6 spray nozzles, 1 trigger-valve sprayer,[1] 2 high-pressure air pumps (a motor pump or air from a tank saves time), and various extra small fittings and tools. A 5-foot stepladder with a wide top is very convenient for reaching ventilator cowls.

After everything is ready, the first business is to make special shots in the holds, including the shelter or bridge deck and bunkers. By "special shots" is meant direct fumigation of small spaces and direct

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[1] These air-jet sprayers were described and illustrated in Public Health Reports for July 24, 1931.

fumigation of subdivisions. Fumigating lower levels through off-set ventilators also comes under this heading. The commonest usually accessible location requiring direct fumigation is the inclosed space under fresh-water tanks. To fumigate this, the trigger-valve (air-jet) sprayer is attached to the tube and is carried by a fumigator, wearing a gas mask, to the tanks. The nozzle is inserted through the small openings, that are generally found, or have been made, and the gas is sprayed directly into the space. The valve of the sprayer is just behind the nozzle and is open only while the trigger is held back. About 15 grams (½ oz.) per second is delivered. The bilges can sometimes be reached for such "shots." Pipe casings and telegraph casings on the shelter deck are often sufficiently accessible to be so treated.

When putting gas into subdivisions of a hold or into lower levels through offset ventilators, the fumigator carries the tube with the ordinary type of spray nozzle and puts it in place. He then returns and the gas is turned on from the deck. If the tube can not be readily withdrawn, it is disconnected from the applicator and left in place until the hold is cleared.

With the usual crew of four men, after the special shots are made, two men go aft with two of the applicators and two forward with the other applicators. Each pair takes a scale. The applicators each have a 30-foot length of tube attached. The 50-foot lengths are used for unusually high ventilators or for reaching out-of-the-way locations. It is generally best to keep the applicators on deck even though this may, at times, require the use of a hundred feet or more of tubing.

The gas is first put down the ventilators. The following describes this procedure when all levels are fumigated by this route: A fumigator with his head in the ventilator cowl and a sharply focused flash light pointed down the shaft, lowers the tube and guides the nozzle into the opening leading to the "'tween deck"; if there are two upper levels, he selects the lower. The ventilator cover is then pulled over the cowl and the desired amount of gas is discharged through the tube. The fumigator now puts on his gas mask and, again looking down the ventilator, pulls the spray nozzle out from the "'tween deck" and lowers it down into the lower hold. If he can not see just where the nozzle is he can tell when it clears the ventilator by swinging the tube; when the metallic clanking of the nozzle against the sides of the ventilator is no longer heard it is below the opening into the lower hold. Gas is now sprayed into the lower hold. If there is a second upper level to be fumigated by this route, the tube is next drawn partly out and the spray nozzle guided into this level for introduction of gas therein.

Whenever it has been possible to clear opposite corners of the weather-deck hatch it is not necessary to put gas into the top level via the ventilators. Instead, the upper level is fumigated through the hatch after the lower levels have been "shot" through the ventilators. In introducing liquid through hatch corners into loaded levels, care must be taken to tuck the tarpaulin closely around the tube lest an excessive amount of the fumigant be lost. It is best to attach the spray nozzle to a bent iron rod, with which it is held under the deck.

After all gas required has been discharged down a ventilator and the valves on the applicator have been closed, the tube is allowed to hang about two minutes till it stops dripping. It is then pulled out and the ventilator closed. The tube and applicator are moved to the the next ventilator or to the hatch corner as required. While the first applicator is in operation, the second is set up at the next ventilator and is operated while the first is being shifted and set up at a new point, the two applicators being operated alternately. This method saves about five minutes per hold.

While gas is being put down a ventilator the cowl should be turned sufficiently into the wind to produce a moderate down draft. If the cowl is turned away from the wind a suction will be produced, which may be sufficient to draw out the gas as fast as it is sprayed in.

Gas masks must generally be used, in placing the tubes, and at all times after the first charge is sent through them. This is because a slight drip from the nozzles usually produces a sufficient concentration in the ventilator shafts to be irritating if not actually dangerous to the fumigator, if unprotected.

Gas should be put down at least two ventilators in each hold. These should be diagonally opposite each other. Four ventilators to a hold will provide more rapid diffusion, but use of this number has not been found necessary and has the double disadvantage of being time-consuming and permitting loss of gas while lowering the tubes.

After gas has been put into all holds the superstructure is fumigated and closed.

Finally gas is put into the bilges. To do this the usual double spray nozzle is removed from the gas tube and is replaced by a single small aluminum nozzle which is only slightly larger than the diameter of the tube. This is lowered down a sounding pipe till it is felt to strike the bottom, when it is raised about 6 inches, and 4 ounces of gas is discharged through it. The operation is repeated in each sounding pipe, of which there are generally two (one on each side) for every hold. Care should be taken that gas is not put down a pipe leading to a water tank. Sounding pipes are generally marked as such by letters stamped into the collar, but they should be verified beforehand by one of the ship's officers. On most ships a 50-foot tube is required to reach the bilges.

If the bilges are dry, the gas will diffuse throughout them; if wet (as is frequent), much of the gas will be absorbed. If the level of the water is above the lower end of the sounding pipe, all of the gas is dissolved in the water. Even in these extreme cases, however, sufficient gas is finally liberated in the bilges to kill rats. This has been demonstrated. A much larger dose than 120 grams (4 ounces) per 1,000 cubic feet would doubtless be more effective, but it is not believed advisable to charge too heavily the water that is found in the majority of bilges. The sounding pipes are closed until the ship goes to dock, when they are opened and left open for two or three days.

FUMIGATING WITH ZYKLON

Zyklon may be effectively used to fumigate loaded ships, but it can not be as accurately distributed as can the liquid hydrocyanic acid. Since Zyklon is a granular solid, it can not be directly discharged through a tube; therefore, in fumigating locations that can be reached only with a tube it is necessary to use a special apparatus with which air is forced through the Zyklon, becoming charged with hydrocyanic acid. It is not nearly so accurate as using the liquid. The first air passed through the Zyklon picks up much more cyanide than the following air, the amount taken up diminishing progressively on account of the marked chilling effect of rapid evaporation.

In fumigating the lower holds Zyklon is poured down the ventilators. Naturally some of it is shunted off to all levels. When it is desired to get most of the Zyklon into the lower hold, the fumigator endeavors to pour straight down the middle of the ventilator. When it is desired to shunt it to an intermediate level he swings the can so as to pour down the sides. Ventilators not infrequently have cross braces near the top. These interfere materially with pouring the Zyklon into the lower hold.

Zyklon could be accurately poured down a tube of large diameter, but the handling of such a tube is very cumbersome, and, due to the different heights of ventilators, it would have to be made in sections of several different lengths. The method, therefore, does not appear to be practicable. It is so much easier to pour Zyklon accurately down a ventilator from which the cowl has been removed that such procedure is more nearly justified with this material than when the liquid is used.

Where Zyklon must be put down an offset ventilator there is no recourse but to use a pump, putting the discharge tube down a vertical section of the ventilator through the ventilating opening on the upper level. In such cases it appears that the most accurate distribution of gas can be secured by first placing two tubes, one in each ventilator to be used, then using all of the Zyklon for that hold, one can at a time, in the pump. Through each charge air is pumped down the tubes for about two minutes and the remaining, partially discharged, Zyklon is scattered in the upper level. If used in this manner the delivery tubes will have to be left in place until the hold is clear.

In the upper level it is usually possible to get the Zyklon under the corners of the hatch. It should not merely be poured into the corner, but the fumigator should get down so as to reach under the edge of the hatch and shake out the Zyklon well under the deck.

The Zyklon pump is used for special shots and for fumigating the bilges in the same general manner as the air-jet sprayer. When used for fumigating pipe casings or under tanks, air under 50 to 100 pounds pressure, passed for 5 or 10 seconds in each location is usually sufficient. For the bilges one 1,200-gram (40-ounce) can of Zyklon is generally used for four bilges, air being passed down the first for 30 seconds, into the second for 1 minute, into the third for 2 minutes, and the fourth for 4 minutes. After this a new Zyklon charge should be used.

When a hand pump is used, instead of air under pressure, one stroke of a pump delivering approximately one-fourth cubic foot (about 7 liters) per stroke should be made for every second of air pressure time.

ZYKLON PUMP

The Zyklon pump as at present devised is in two forms; one has a metal container holding easily the contents of a 1,200-gram (40-ounce) can of Zyklon. At the bottom is a pipe, protected inside the container with wire mesh. This leads to a hand pump. In the pipe is connected a check valve, and in the top of the check valve is set a Schrader air valve. This arrangement permits the use of either a hand pump or air under pressure. The Zyklon container has a removable top which can be screwed down tight by four hinged bolts fitting into slots around the edge, air-tight closure being secured by a ring gasket. An ordinary gas connection nipple, also protected inside by a wire mesh, is set in the top, forming a connection for the delivery tube. The whole apparatus is set on a board with a carrying handle attached at the center. The other type consists merely of two heads, each with a gas nipple set in the center, held together by long T bolts, attached permanently by hinges to one head, but fitting into slots at the edge of the other, and tightened by wing nuts. Each head has a circular rubber gasket. The Zyklon can is punctured at each end. The two heads are then fitted over the two ends of the can and the bolts are swung into place and tightened. Air from the pump or under pressure is then forced in at one end and taken out through the delivery tube attached at the other. If desired, one head may have the nipple connection replaced by a Schrader air valve (an old tire valve does very well).

CLEARING

Clearing the superstructure on a loaded ship is in no way different from clearing the superstructure on an empty vessel.

Clearing the holds offers only the difficulty that lower holds under loaded upper levels can clear only through ventilators, and bilges can clear only through the sounding pipes and by slow diffusion through the cargo. In practice these difficulties are unimportant in the great majority of cases.

Once the tarpaulins are removed from the hatches of the upper level, the clearing of this level, as a rule, proceeds as rapidly as on an empty vessel. If the hatch is not entirely closed by cargo, a "through-and-through" draft is produced by way of it and the ventilators, which removes the gas quickly. It is quite unusual to require longer than one hour to clear this level sufficiently so that fumigators can crawl over the cargo searching for rats or removing tubes placed for fumigation.

Concentration tests with methyl orange test papers can be made in the upper levels by attaching the test paper to the end of a stick and holding the stick as far as possible under the deck for the required two minutes. Concentration tests can be made in the lower holds by lowering the test papers down the ventilators and guiding into the different levels. In doing this, care must be taken to turn the ventilator cowl away from the wind. If it is turned toward the wind there will occur a down draft so that the air at the bottom of the ventilator will be fresh and show no signs of gas.

The exception to rapid clearing of the upper level is seen when bulk cargo seals the hatchway. In such cases clearing the upper level may take as long as two or, in exceptional cases, three hours. It rarely takes as long, however, as two hours, probably for the reason that the space above bulk cargo is comparatively small and unobstructed so that it does not require a large volume of air to thoroughly ventilate it.

Loaded lower levels, below empty or partially loaded upper levels, clear quickly when the hatchway is not obstructed or closed. An hour and a half is usually quite sufficient. In some recorded instances lower levels have cleared completely through quite small openings in the hatches in less than an hour.

Lower levels under loaded upper levels sometimes require four or five hours to clear thoroughly through the ventilators. This is a matter, however, of little concern, for the reason that, since it is necessary to remove the cargo on the upper level before the lower level can be reached, ample time is afforded. On more than 50 fully loaded vessels fumigated at New York the lower levels have always been found absolutely clear when reached through the "'tween deck" hatches.

If the ship is fumigated in the stream and has any material distance (say 2 or 3 miles) to go before reaching its dock the holds will clear en route. The aeration of holds is much increased when the vessel is under way.

CLEARING BILGES

On fully loaded ships fumigated at New York the fumigated bilges have usually been found clear of gas when reached. The same has been true of a number of vessels loaded only in the lower holds. The amount of gas put into the bilges is insufficient, even should all of it be retained, to produce a lethal concentration in the holds above them.

There is one special danger in bilges fumigated via sounding pipes which requires specific attention. It has been found that when the lower end of the sounding pipe is covered with wet débris or muck, as is not infrequently the case, this material absorbs the gas and may retain it for long periods. When the bilges are cleaned, a man must get directly into them and scoop up this muck, which may then release sufficient gas to produce a lethal concentration in the air in the bilge. Attention has been directed to this danger by a fatal poisoning occurring 14 days after fumigation.

To control this condition, it is necessary for a guard to be present when the bilges are opened and for him personally to superintend the removal of muck or débris from under and around all sounding pipes, making tests for presence of gas. When the guard finds this work dangerous, fumigators with gas masks should be sent to perform it.

SEARCH FOR RATS

The collection of dead rats and their examination in the laboratory is generally a matter of greater importance on a loaded ship than on one fumigated empty. It is also more difficult. Rats deep in the cargo and those at the bottom of deep narrow crevices must await unloading operations, but as a rule a considerable proportion of the rats will be reasonably accessible. These should be searched for and collected. For this purpose, in addition to all unloaded parts of the ship, all reasonably accessible cargo surfaces should be inspected, including the accessible locations where there is a space of 2 feet or more between the top of the cargo and the deck. Fumigators should not be required to crawl over bulk grain, linseed, or other very mobile cargo, though they may safely walk in it where there is sufficient headroom.

GUARDS

After a ship has been fumigated loaded, the fumigators should remain aboard until all accessible portions of the vessel are safe to enter. When that has been demonstrated, the crew may be permitted aboard, regardless of gas in inaccessible lower holds and bilges.

During the process of unloading, however, a fumigator should be stationed as a guard on the ship until he has definitely determined that the lower holds are clear of gas. When sure of this the guard may be removed, if required for other duty, but must return when the bilges are reached and be present when they are opened.

While the first duty of a guard is to determine the safety of the holds, he should utilize a large part of his time searching for dead rats that may appear as the cargo is removed. On a ship moderately or heavily rat infested, a guard should be maintained for this latter purpose until the vessel is empty.

A third duty of the guard is to look for evidence of live rats. It is on the numbers of dead rats recovered and the evidence of live rats that estimates of the effectiveness of fumigations are based. If there are any considerable number of live rats left on the ship, the guard will generally see some of them running around at one time or another. When this occurs, or other sufficient evidence of rats is found, refumigation after partial discharge of cargo may be justified; otherwise refumigation is either not required or is done after complete discharge of cargo. When the ship is empty, a careful inspection should be made for the purpose of estimating the number of live rats remaining on board.

DAMAGE TO CARGO

So far as known, fumigation of loaded ships with liquid HCN containing up to 10 per cent chloropicrin or with Zyklon containing 5 per cent chloropicrin causes no damage to the cargo. This statement is based on the fact that fumigation of approximately 100 loaded ships at New York has not elicited a single complaint of damage to cargo attributable to the fumigant.

Recently a prominent tea distributing company suggested that cyanide fumigation might affect the flavor of tea; but samples fumigated in the laboratory with concentrations up to 240 grams (8 ounces) per 1,000 cubic feet and exposures up to 14 hours, when examined by experts, could not be separated from samples that had not been fumigated.

ABSORPTION BY CARGO

There is some evidence that cargo absorbs the fumigant. Principally this evidence is the failure to secure higher concentrations in loaded holds than in the same holds when fumigated empty with equal amounts. In some cases, in lower levels under loaded upper levels, concentration of the fumigant has dropped much more rapidly than could reasonably be accounted for by the available routes for dissipation. The evidence at present at hand tends to establish the belief that most cargoes absorb sufficient gas to require that the full dose, calculated from the capacity of the hold, be introduced to produce an adequate concentration.

An additional absorption factor appears in some loaded holds in the form of moisture produced by sweating. This varies with different cargoes and varying weather conditions. At times it is sufficient apparently to absorb nearly all of the gas, so that when the hold is opened hardly more than an odor of cyanide can be detected. In such cases the possibility of later release of the gas should be borne in mind, and guards should be maintained during unloading until any danger of such result has passed. If any material amount of cyanide is held by moisture of cargo, it should manifest itself by the persistent presence of detectable odor.

COURT DECISION RELATING TO PUBLIC HEALTH

Injunction granted to restrain interference with State agents in enforcing bovine tuberculosis law.—(Nebraska Supreme Court; State ex rel. Sorensen, Attorney General *v.* Knudtsen, 236 N. W. 696; decided May 22, 1931.) An action was brought by the State on the relation of the attorney general to enjoin the defendant from obstructing and preventing State agents from applying the tuberculin test to defendant's breeding cattle and otherwise carrying out the provisions of chapter 12, Laws 1927.

The defendant challenged the validity of the initial proceeding before the State secretary of agriculture wherein Cedar County was declared a testing area, but the supreme court held that the challenge as made by the defendant was not in the nature of a review but was essentially a collateral attack on the determination made by the secretary, and that, if the secretary had erred, it was an error which was subject to review, if at all, by a direct proceeding and not by a collateral attack.

The defendant's contention that injunction was not a remedy available to the State was answered by the court saying that it was of the opinion that such contention was foreclosed by the court's previous decisions, and also pointing out that the 1927 law in express terms conferred upon district courts the power "by injunction, to compel the observation of and by that remedy enforce the provisions of this act."

Regarding the challenge to the validity of chapter 7, Laws 1925, and chapter 12, Laws 1927, the court said:

* * * we have carefully reexamined, reapproved, and now reiterate our previous decisions which sustain the statutes referred to as being neither enacted in a manner contravening section 14, art. 3, of the State constitution [section 14 provided, in part, that "No bill shall contain more than one subject, and the same shall be clearly expressed in the title."], nor being in fact an unconstitutional delegation of legislative power. (State *v.* Heldt, 115 Neb. 435, 213 N. W. 578; State *v.* Wallace, 117 Neb. 588, 221 N. W. 712; State *v.* Splittgerber, 119 Neb. 436, 229 N. W. 332.)

With reference to defendant's contentions as to the laws under consideration being violative of certain provisions of the Federal Constitution, the court refused to pass on the question, saying, in part:

* * * while it may be said that this court has in the three cases last cited [see cases cited above] determined these questions adversely to the position of the defendant, still this court is committed to the view that the constitutionality of a law will not be determined on review in any case where that question was not presented in the court below. * * *

* * * Not having been presented to the trial court, the question involved may not be properly determined by this tribunal on appeal, and is not herein decided.

DEATHS DURING WEEK ENDED JULY 11, 1931

Summary of information received by telegraph from industrial insurance companies for the week ended July 11, 1931, and corresponding week of 1930. (From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce)

	Week ended July 11, 1931	Corresponding week, 1930
Policies in force	75, 105, 915	76, 067, 749
Number of death claims	12, 426	13, 433
Death claims per 1,000 policies in force, annual rate	8. 6	9. 2

Deaths [1] from all causes in certain large cities of the United States during the week ended July 11, 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 midyear population estimates derived from the 1930 census]

City	Week ended July 11, 1931				Corresponding week, 1930		Death rate [2] for the first 28 weeks	
	Total deaths	Death rate [2]	Deaths under 1 year	Infant mortality rate [3]	Death rate [2]	Deaths under 1 year	1931	1930
Total (82 cities)	7, 400	10. 8	660	[4] 51	11. 0	711	12. 9	12. 7
Akron	35	7. 1	3	30	3. 9	3	8. 2	8. 1
Albany [5]	31	12. 5	3	59	16. 7	0	14. 6	15. 6
Atlanta	99	18. 6	12	123	16. 9	11	16. 1	16. 8
White	45	-------	5	79	-------	4	-------	-------
Colored	54	(6)	7	202	(6)	7	(6)	(6)
Baltimore [5]	172	11. 0	14	47	12. 2	19	15. 5	14. 6
White	121	-------	12	52	-------	14	-------	-------
Colored	51	(6)	2	31	(6)	5	(6)	(6)
Birmingham	84	16. 3	9	91	11. 8	5	14. 7	14. 3
White	36	-------	3	51	-------	2	-------	-------
Colored	48	(6)	6	146	(6)	3	(6)	(6)
Boston	194	12. 9	27	77	11. 3	19	15. 2	15. 2
Bridgeport	30	10. 6	1	17	10. 3	2	12. 0	12. 1
Buffalo	161	14. 4	18	74	11. 6	15	14. 1	13. 8
Cambridge	13	5. 9	1	20	8. 3	2	13. 1	13. 0
Camden	23	10. 1	3	52	9. 7	2	15. 3	14. 2

[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 77 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.

Deaths from all causes in certain large cities of the United States during the week ended July 11, 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)—Continued

City	Week ended July 11, 1931				Corresponding week, 1930		Death rate for the first 28 weeks	
	Total deaths	Death rate	Deaths under 1 year	Infant mortality rate	Death rate	Deaths under 1 year	1931	1930
Canton	16	7.8	4	91	9.9	0	10.9	10.8
Chicago [5]	691	10.4	50	44	8.9	57	11.6	11.0
Cincinnati	161	18.4	19	114	14.1	10	16.8	16.1
Cleveland	182	10.4	21	61	10.1	19	11.9	11.9
Columbus	79	13.9	6	59	12.2	5	14.6	16.9
Dallas	71	13.6	7		11.1	7	12.1	12.0
White	53		3			7		
Colored	18	(6)	4		(6)	0	(6)	(6)
Dayton	35	8.8	1	14	10.1	1	12.7	10.4
Denver	82	14.7	5	48	18.4	16	14.8	15.1
Des Moines	22	7.9	1	18	11.3	2	11.8	12.4
Detroit	243	7.7	24	38	8.4	36	9.0	10.1
Duluth	21	10.8	3	74	16.9	1	11.0	11.8
El Paso	36	17.9	8		15.2	6	17.2	18.7
Erie	18	8.0	3	56	20.2	6	11.1	11.7
Fall River [5] [7]	20	9.0	2	45	10.0	2	12.6	13.1
Flint	22	7.9	0	0	7.3	0	7.8	9.8
Fort Worth	19	5.9	5		12.1	6	11.4	11.6
White	15		5			5		
Colored	4	(6)	0		(6)	1	(6)	(6)
Grand Rapids	17	5.2	1	15	9.9	5	9.7	11.2
Houston	86	14.5	8		10.9	7	11.6	12.8
White	56		6			5		
Colored	30	(6)	2		(6)	2	(6)	(6)
Indianapolis	107	15.1	7	58	12.8	1	14.6	15.1
White	92		5	47		1		
Colored	15	(6)	2	134	(6)	0	(6)	(6)
Jersey City	53	8.7	4	36	9.5	5	12.4	12.2
Kansas City, Kans.	22	9.3	0	0	13.2	5	14.0	11.5
White	16		0	0		4		
Colored	6	(6)	0	0	(6)	1	(6)	(6)
Kansas City, Mo.	85	10.8	4	30	12.6	9	14.2	13.6
Knoxville	25	11.9	4	85	14.7	3	13.4	14.6
White	18		3	71		3		
Colored	7	(6)	1	204	(6)	0	(6)	(6)
Long Beach	25	8.6	0	0	9.4	2	10.3	10.0
Los Angeles	297	11.8	19	55	10.4	28	11.2	11.5
Louisville	79	13.4	8	69	12.5	3	15.3	13.9
White	68		8	79		3		
Colored	11	(6)	0	0	(6)	0	(6)	(6)
Lowell [7]	32	16.6	5	127	13.5	2	13.6	14.6
Lynn	13	6.6	0	0	5.6	0	10.6	11.4
Memphis	68	13.7	4	42	16.0	7	17.1	18.0
White	32		2	33		5		
Colored	36	(6)	2	58	(6)	2	(6)	(6)
Miami	23	10.7	0	0	8.0	3	12.7	11.9
White	12		0	0		1		
Colored	11	(6)	0	0	(6)	2	(6)	(6)
Milwaukee	95	8.4	11	48	9.1	10	10.1	10.3
Minneapolis	108	11.9	8	52	12.0	9	12.0	11.1
Nashville	53	17.8	4	60	24.7	4	17.5	16.9
White	30		2	40		3		
Colored	23	(6)	2	118	(6)	1	(6)	(6)
New Bedford [7]	26	12.0	5	133	9.7	5	13.2	12.0
New Haven	40	12.8	3	57	9.6	1	12.6	14.1
New Orleans	159	17.7	21	115	17.6	15	17.9	18.6
White	90		12	99		11		
Colored	69	(6)	9	147	(6)	4	(6)	(6)
New York	1,277	9.4	113	47	9.3	127	12.1	11.6
Bronx Borough	183	7.2	14	32	7.3	8	8.9	8.4
Brooklyn Borough	434	8.6	9	52	8.3	49	11.2	10.7
Manhattan Borough	497	14.3	40	68	13.0	54	18.5	17.3
Queens Borough	114	5.2	8	22	7.1	11	7.8	7.6
Richmond Borough	49	15.6	2	36	15.4	5	14.2	14.9
Newark, N. J.	100	11.7	11	58	11.9	9	12.6	13.2
Oakland	54	9.6	3	38	8.4	5	11.0	11.4

[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.

Deaths from all causes in certain large cities of the United States during the week ended July 11, 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)—Continued

City	Week ended July 11, 1931				Corresponding week, 1930		Death rate for the first 28 weeks	
	Total deaths	Death rate	Deaths under 1 year	Infant mortality rate	Death rate	Deaths under 1 year	1931	1930
Oklahoma City	27	7.2	1	14	14.7	17	11.6	10.6
Omaha	46	11.1	6	67	15.8	5	14.7	13.9
Paterson	29	10.9	1	17	13.9	6	14.4	13.2
Peoria	25	12.0	4	105	16.3	1	13.6	13.0
Philadelphia	378	10.0	39	57	10.4	31	14.4	13.2
Pittsburgh	154	11.9	19	66	11.8	15	15.9	14.7
Portland, Oreg	55	9.3	3	36	13.6	2	12.1	13.0
Providence	39	8.0	7	65	11.5	6	13.8	14.2
Richmond	54	15.3	9	131	12.8	2	16.5	15.7
White	33		2	44		0		
Colored	21	(6)	7	304	(6)	2	(6)	(6)
Rochester	53	8.3	4	36	9.7	3	12.9	12.2
St. Louis	187	11.8	8	27	14.9	19	16.7	14.5
St. Paul	61	11.5	1	10	11.3	1	11.6	10.8
Salt Lake City [5]	36	13.1	2	30	11.5	4	12.7	13.4
San Antonio	59	12.8	10		15.0	16	15.9	18.3
San Diego	40	13.3	2	41	17.1	1	14.4	14.8
San Francisco	139	11.2	9	60	14.6	6	13.5	13.4
Schenectady	13	7.0	2	59	9.8	1	10.7	11.8
Seattle	84	11.8	0	0	10.9	1	12.0	11.4
Somerville	11	5.5	2	74	10.5	1	10.1	10.8
South Bend	9	4.3	1	25	10.4	2	8.7	9.5
Spokane	22	9.9	1	26	11.7	1	12.8	13.0
Springfield, Mass	25	8.6	1	15	11.8	6	12.8	13.2
Syracuse	35	8.6	2	24	6.7	4	12.3	12.5
Tacoma	26	12.6	0	0	11.7	3	13.0	13.0
Toledo	70	12.4	4	37	15.7	5	12.7	13.4
Trenton	35	14.7	5	87	12.7	4	17.8	17.3
Utica	18	9.2	1	26	12.8	2	14.9	15.9
Washington, D. C	134	14.2	14	78	15.2	17	16.7	15.8
White	87		10	82		7		
Colored	47	(6)	4	69	(6)	10	(6)	(6)
Waterbury	19	9.8	1	30	9.9	2	10.3	10.5
Wilmington, Del. [7]	21	10.3	1	22	9.8	0	15.1	15.0
Worcester	32	8.5	1	14	12.0	0	13.3	13.9
Yonkers	17	6.4	0	0	5.4	1	9.3	8.5
Youngstown	43	13.0	6	84	11.6	9	11.0	10.6

[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; Huston, 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, 1920; 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 July 18, 1931, and July 19, 1930

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 18, 1931, and July 19, 1930

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 18, 1931	Week ended July 19, 1930	Week ended July 18, 1931	Week ended July 19, 1930	Week ended July 18, 1931	Week ended July 19, 1930	Week ended July 18, 1931	Week ended July 19, 1930
New England States:								
Maine	2	6		1	10	3	0	0
New Hampshire					1	8	0	0
Vermont		1				2	0	0
Massachusetts	33	32	3	1	228	206	1	1
Rhode Island	2	1			61	7	0	0
Connecticut	8	20	1	1	133	17	0	5
Middle Atlantic States:								
New York	81	68	[1] 1	[1] 3	842	536	8	10
New Jersey	24	46	1	1	202	273	2	6
Pennsylvania	60	70			587	329	0	7
East North Central States:								
Ohio	11	14	8	2	126	73	0	3
Indiana	12	13		3	26	22	4	3
Illinois	69	90	45	2	358	88	4	7
Michigan	26	48			134	185	4	9
Wisconsin	5	7	8	6	216	213	1	2
West North Central States:								
Minnesota	4	9	1		26	32	0	0
Iowa	1				20	9	2	1
Missouri	14	16		3	15	22	4	5
North Dakota	10	3			1	11	0	0
South Dakota	5	4			3	12	0	2
Nebraska	3	4			1	15	0	1
Kansas	12	2		1	4	45	1	4
South Atlantic States:								
Delaware					17	1	0	0
Maryland [2]	8	11	2		66	8	5	1
District of Columbia	7	9			8	27	0	0
West Virginia	4	4	4	9	102	28	0	0
North Carolina	16	23		17	101	38	0	2
South Carolina	3	7	48	66	25		0	0
Georgia [3]	2	4	3	3	7	21	0	2
Florida [3]	5	12		2	12	23	0	0
East South Central States:								
Kentucky	2				8		0	0
Tennessee	3	3	1	5	4	10	2	0
Alabama [3]	11	6	5	3	21	43	3	1
Mississippi	10	13					0	3

[1] New York City only.
[2] Week ended Friday.
[3] Typhus fever: 1931, 9 cases; 5 cases in Georgia, 1 case in Florida, and 3 cases in Alabama.

***Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended July 18, 1931, and July 19, 1930*—Continued**

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended July 18, 1931	Week ended July 19, 1930	Week ended July 18, 1931	Week ended July 19, 1930	Week ended July 18, 1931	Week ended July 19, 1930	Week ended July 18, 1931	Week ended July 19, 1930
West South Central States:								
Arkansas	1	1		8	4	6	0	0
Louisiana	12	9	3	2	2	3	2	1
Oklahoma [4]	5	7	5	8	6	7	0	0
Texas	26	14	1	2	19	46	1	1
Mountain States:								
Montana		1			10	3	0	2
Idaho	3				6		3	2
Wyoming		1			4	9	0	0
Colorado	8	9			9	52	0	1
New Mexico	1	4			7	5	0	0
Arizona		1				48	0	2
Utah [2]			6	4	6	8	0	2
Pacific States:								
Washington	5	5			9	109	1	1
Oregon	3	1	8	3	23	29	0	2
California	51	43	8	21	159	326	1	1

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 18, 1931	Week ended July 19, 1930	Week ended July 18, 1931	Week ended July 19, 1930	Week ended July 18, 1931	Week ended July 19, 1930	Week ended July 18, 1931	Week ended July 19, 1930
New England States:								
Maine	0	0	8	16	0	0	2	0
New Hampshire	1	1	0	7	0	0	2	0
Vermont	1	0	8	3	11	0	0	0
Massachusetts	16	6	106	50	0	0	12	3
Rhode Island	0	0	2	3	0	0	0	0
Connecticut	5	0	16	8	0	0	4	2
Middle Atlantic States:								
New York	57	12	154	81	4	1	16	16
New Jersey	1	2	65	21	0	0	4	3
Pennsylvania	1	1	142	103	1	1	23	20
East North Central States:								
Ohio	1	5	51	50	34	33	5	18
Indiana	0	5	29	22	27	58	7	12
Illinois	3	2	122	83	9	43	18	22
Michigan	7	0	119	85	5	28	7	9
Wisconsin	6	1	37	42	9	70	5	1
West North Central States:								
Minnesota	1	10	11	19	1	4	1	7
Iowa	0	2	24	9	33	53	0	2
Missouri	0	0	15	13	2	11	17	21
North Dakota	0	0	2	1	1	2	0	1
South Dakota	1	2	6	2	3	9	2	0
Nebraska	0	0	4	6	7	13	2	2
Kansas	1	5	16	16	15	22	8	15
South Atlantic States:								
Delaware	0	0	1	1	0	0	14	2
Maryland [2]	0	0	16	13	0	0	7	14
District of Columbia	0	0	5	5	0	0	0	2
West Virginia	0	1	6	17	0	5	17	21
North Carolina	1	7	15	27	0	6	59	78
South Carolina	2	1	6	5	0	0	101	85
Georgia [3]	0	0	12	6	0	0	93	86
Florida [3]	0	0	2	0	0	0	6	12
East South Central States:								
Kentucky	0	1	12	6	0	0	22	13
Tennessee	1	1	9	4	1	4	39	64
Alabama [3]	1	1	6	11	1	2	29	43
Mississippi	2	2	3	2	5	4	41	39
West South Central States:								
Arkansas	0	4	1	0	1	1	28	30
Louisiana	0	15	6	3	2	17	49	24
Oklahoma [4]	1	1	5	7	8	43	38	49
Texas	2	4	32	10	3	9	40	24

[2] Week ended Friday.
[3] Typhus fever: 1931, 9 cases; 5 cases in Georgia, 1 case in Florida, and 3 cases in Alabama.
[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 July 18, 1931, and July 19, 1930—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended July 18, 1931	Week ended July 19, 1930	Week ended July 18, 1931	Week ended July 19, 1930	Week ended July 18, 1931	Week ended July 19, 1930	Week ended July 18, 1931	Week ended July 19, 1930
Mountain States:								
Montana	0	0	2	4	3	2	4	2
Idaho	0	0	7	0	0	3	5	0
Wyoming	0	0	4	4	0	8	1	0
Colorado	0	0	10	9	0	2	1	4
New Mexico	0	0	1	4	0	1	3	11
Arizona	0	1	1	0	0	1	2	6
Utah [3]	0	0	2	1	0	0	1	1
Pacific States:								
Washington	1	3	6	5	18	20	2	2
Oregon	0	2	2	1	6	12	5	7
California	3	98	32	40	7	18	13	15

[3] Week ended Friday.

SUMMARY OF MONTHLY REPORTS FROM STATES

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

State	Cerebrospinal meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
June, 1931										
Massachusetts	7	191	3	1	2,360	2	15	899	0	18
Minnesota	14	73	2		508		5	195	49	10
New Jersey	13	153	19	3	3,066		1	813	1	18
New York	39	546		11	9,950		17	2,418	105	76
Ohio	18	104	50	3	3,793		8	993	126	43
Rhode Island		27			506		0	122	0	1
West Virginia	4	28	12		771		2	74	11	27

June, 1931

	Cases
Actinomycosis:	
Massachusetts	1
Anthrax:	
Massachusetts	1
New York	1
Chicken pox:	
Massachusetts	1,076
Minnesota	760
New Jersey	1,253
New York	2,490
Ohio	1,395
Rhode Island	31
West Virginia	163
Diarrhea and enteritis (under 2 years):	
Ohio	17
Dysentery:	
Minnesota	15
New Jersey	6
New York	2
Ohio	1
Food poisoning:	
Ohio	1
German measles:	
Massachusetts	352
New Jersey	183

German measles—Continued.	Cases
New York	1,394
Ohio	52
Rhode Island	8
Lead poisoning:	
Massachusetts	1
New Jersey	4
Ohio	17
Lethargic encephalitis:	
Massachusetts	1
Minnesota	2
New Jersey	4
New York	13
Ohio	3
Mumps:	
Massachusetts	597
New Jersey	277
New York	1,471
Ohio	1,481
Rhode Island	233
Ophthalmia neonatorum:	
Massachusetts	119
Minnesota	2
New York	2
Ohio	80
Rhode Island	3

	Cases
Paratyphoid fever:	
New Jersey	2
New York	24
Ohio	1
Puerperal septicemia:	
New York	21
Ohio	9
Rabies in animals:	
New York	13
Rhode Island	3
Rabies in man:	
Massachusetts	2
Ohio	1
Septic sore throat:	
Massachusetts	8
New York	56
Ohio	74
Rhode Island	1
Tetanus:	
Massachusetts	2
New Jersey	2
New York	5
Ohio	3
Trachoma:	
Massachusetts	3
Minnesota	2
Trachoma—Continued.	
New Jersey	1
Ohio	2
Trichinosis:	
Massachusetts	1
Tularaemia:	
New York	1
Typhus fever:	
New York	2
Undulant fever:	
Massachusetts	1
Minnesota	5
New Jersey	2
New York	28
Ohio	13
Vincent's angina:	
New York [1]	61
Whooping cough:	
Massachusetts	505
Minnesota	166
New Jersey	1,370
New York	2,032
Ohio	727
Rhode Island	35
West Virginia	250

[1] New York City not included.

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES

The 98 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 33,480,000. The estimated population of the 91 cities reporting deaths is more than 31,935,000. The estimated expectancy is based on the experience of the last nine years, excluding epidemics.

Weeks ended July 11, 1931, and July 12, 1930

	1931	1930	Estimated expectancy
Cases reported			
Diphtheria:			
46 States	601	782	
98 cities	273	365	534
Measles:			
45 States	6,123	4,979	
98 cities	2,030	1,588	
Meningococcus meningitis:			
46 States	64	74	
98 cities	34	45	
Poliomyelitis:			
46 States	90	213	
Scarlet fever:			
46 States	1,389	1,228	
98 cities	505	446	493
Smallpox:			
46 States	419	588	
98 cities	15	43	23
Typhoid fever:			
46 States	700	657	
98 cities	92	99	70
Deaths reported			
Influenza and pneumonia:			
91 cities	378	339	
Smallpox:			
91 cities	0	0	

City reports for week ended July 11, 1931

The "estimated expectancy" given for diphtheria, poliomyelitis, scarlet fever, smallpox, and typhoid fever is the result of an attempt to ascertain from previous occurrence the number of cases of the disease under consideration that may be expected to occur during a certain week in the absence of epidemics. It is based on reports to the Public Health Service during the past nine years. It is in most instances the median number of cases reported in the corresponding weeks of the preceding years. When the reports include several epidemics, or when for other reasons the median is unsatisfactory, the epidemic periods are excluded, and the estimated expectancy is the mean number of cases reported for the week during 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	1	0	1	----------	0	0	0	1
New Hampshire:								
Concord	0	0	0	----------	0	1	0	0
Nashua	0	0	0	----------	0	0	0	0
Vermont:								
Barre	0	0	0	----------	0	0	0	0
Massachusetts:								
Boston	33	22	21	2	1	31	8	16
Fall River	0	2	0	----------	0	19	3	0
Springfield	3	1	0	----------	0	11	9	1
Worcester	9	1	0	----------	0	2	11	1
Rhode Island:								
Pawtucket	0	0	0	----------	0	0	0	0
Providence	0	3	2	----------	0	68	16	2
Connecticut:								
Bridgeport	6	3	0	----------	0	7	2	1
Hartford	0	2	1	----------	0	2	1	8
New Haven	1	0	0	1	0	5	8	8
MIDDLE ATLANTIC								
New York:								
Buffalo	19	8	4	----------	1	35	14	4
New York	118	165	91	10	3	414	48	81
Rochester	7	4	2	----------	0	113	7	2
Syracuse	10	1	0	----------	0	24	0	1
New Jersey:								
Camden	0	4	1	----------	0	1	0	0
Newark	20	9	2	----------	0	7	3	3
Trenton	0	1	0	----------	0	5	6	4
Pennsylvania:								
Philadelphia	33	38	3	----------	4	46	9	22
Pittsburgh	13	13	8	----------	0	49	43	14
Reading	2	1	0	----------	0	2	4	0
EAST NORTH CENTRAL								
Ohio:								
Cincinnati	3	3	2	----------	1	17	1	6
Cleveland	55	19	3	1	0	203	65	8
Columbus	6	2	1	1	1	5	2	2
Toledo	40	3	1	1	1	18	6	2
Indiana:								
Fort Wayne	2	1	4	----------	0	1	0	3
Indianapolis	3	1	0	----------	0	24	2	11
South Bend	1	0	0	----------	0	7	0	0
Terre Haute	0	0	0	----------	0	1	0	2
Illinois:								
Chicago	66	68	47	----------	2	409	25	26
Springfield	4	1	0	----------	0	1	0	0
Michigan:								
Detroit	36	31	9	----------	0	27	11	11
Flint	4	1	0	----------	0	0	2	2
Grand Rapids	2	1	0	----------	0	18	0	1

City reports for week ended July 11, 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			
EAST NORTH CENTRAL—continued								
Wisconsin:								
Kenosha	0	0	0		0	4	31	1
Milwaukee	66	9	1		0	150	69	3
Racine	7	0	0		0	1	17	0
Superior	3	0	0		0	0	1	1
WEST NORTH CENTRAL								
Minnesota:								
Duluth	7	0	0		0	0	0	0
Minneapolis	16	8	0		0	20	4	5
St. Paul	12	5	0		0	17	0	9
Iowa:								
Davenport	1	0	0			0	0	
Des Moines	0	0	0			0	0	
Sioux City	0	1	1			0	2	
Waterloo	0	0	0			1	0	
Missouri:								
Kansas City	0	1	1		0	8	1	7
St. Joseph	0	0	2		0	1	0	3
St. Louis	6	19	9			3	4	
North Dakota:								
Fargo	0	0	0		0	0	0	0
Grand Forks	0	0	0			0	0	
South Dakota:								
Aberdeen	4	0	0			0	0	
Sioux Falls	0	0	0			1	0	
Nebraska:								
Omaha	0	2	3		0	0	4	4
Kansas:								
Topeka	0	0	0	2	0	4	32	1
Wichita	0	0	0		0	0	0	1
SOUTH ATLANTIC								
Delaware:								
Wilmington	0	1	0		0	6	0	0
Maryland:								
Baltimore	11	11	4		0	38	11	9
Cumberland	0	0	0		0	1	0	0
Frederick	0	0	0		0	6	0	0
District of Columbia:								
Washington	0	5	1		0	12	0	6
Virginia:								
Lynchburg	0	0	0		0	0	0	1
Norfolk	1	0	3		0	4	0	0
Richmond	0	1	0		0	3	0	1
Roanoke	0	0	1		1	3	0	0
West Virginia:								
Charleston	0	0	0		0	0	0	1
Wheeling	0	0	0		0	10	0	1
North Carolina:								
Raleigh	0	0	1		0	9	0	0
Wilmington	0	0	1		0	2	0	1
Winston-Salem	3	0	0		0	37	6	1
South Carolina:								
Charleston	0	0	0	16	0	0	0	1
Columbia	0	0	0		1	0	0	6
Georgia:								
Atlanta	1	1	1	1	0	1	0	7
Brunswick	0	0	0		0	0	0	0
Savannah	0	1	0	1	0	0	3	1
Florida:								
Miami	0	1	0		0	4	0	0
Tampa	0	0	0		0	3	0	0
EAST SOUTH CENTRAL								
Kentucky:								
Covington	0	0	0		0	0	0	0
Tennessee:								
Memphis	2	0	2		0	14	2	0
Nashville	0	0	0		0	5	0	5
Alabama:								
Birmingham	1	1	0	1	1	0	1	3
Mobile	0	0	2		0	0	0	0
Montgomery	0	0	0			1	0	

City reports for week ended July 11, 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			
WEST SOUTH CENTRAL								
Arkansas:								
Fort Smith	0	0	0	----------	----------	0	0	----------
Little Rock	0	0	0	----------	0	1	1	3
Louisiana:								
New Orleans	2	5	13	1	0	0	0	11
Shreveport	0	0	0	----------	0	1	0	1
Oklahoma:								
Muskogee	0	0	0	----------	0	0	0	0
Oklahoma City	0	0	1	----------	1	0	0	1
Texas:								
Dallas	0	3	3	----------	0	2	0	3
Fort Worth	0	1	1	----------	0	5	0	0
Galveston	0	0	0	----------	0	0	0	0
Houston	0	2	2	----------	0	2	0	6
San Antonio	0	1	0	----------	2	2	0	1
MOUNTAIN								
Montana:								
Billings	2	0	0	----------	0	6	0	0
Great Falls	15	0	0	----------	0	3	0	0
Helena	0	0	0	----------	0	0	0	0
Missoula	0	0	0	----------	0	0	0	0
Idaho:								
Boise	0	0	0	----------	0	1	1	0
Colorado:								
Denver	4	7	2	----------	0	3	15	4
Pueblo	4	1	0	----------	0	----------	0	0
New Mexico:								
Albuquerque	7	0	0	----------	0	1	1	0
Arizona:								
Phoenix	0	0	1	----------	0	0	0	1
Utah:								
Salt Lake City	8	2	0	----------	0	1	1	0
Nevada:								
Reno	0	0	0	----------	0	0	0	3
PACIFIC								
Washington:								
Seattle	12	2	0	----------	----------	11	5	----------
Spokane	3	1	0	----------	----------	0	0	----------
Tacoma	4	2	2	----------	0	0	1	1
Oregon:								
Portland	9	4	0	----------	0	2	5	1
Salem	1	0	0	----------	0	1	11	0
California:								
Los Angeles	9	25	13	4	0	29	7	9
Sacramento	1	2	3	----------	0	23	0	0
San Francisco	5	9	3	1	0	30	1	3

City reports for week ended July 11, 1931—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths all causes
NEW ENGLAND											
Maine:											
Portland	1	0	0	0	0	1	1	0	0	0	21
New Hampshire:											
Concord	0	0	0	0	0	0	0	0	0	0	4
Nashua	0	0	0	0	0	0	0	0	0	0	0
Vermont:											
Barre	0	1	0	1	0	0	0	0	0	0	4
Massachusetts:											
Boston	31	25	0	0	0	14	1	0	0	29	194
Fall River	1	4	0	0	0	1	0	0	0	2	20
Springfield	2	3	0	0	0	2	0	0	0	6	28
Worcester	4	10	0	0	0	1	0	0	0	14	32
Rhode Island:											
Pawtucket	0	1	0	0	0	0	0	0	0	0	5
Providence	4	6	0	0	0	2	0	0	0	19	39
Connecticut:											
Bridgeport	3	5	0	0	0	3	0	0	0	1	30
Hartford	2	2	0	0	0	1	0	1	0	4	31
New Haven	1	2	0	0	0	2	0	0	0	4	40
MIDDLE ATLANTIC											
New York:											
Buffalo	12	15	0	0	0	9	1	0	0	29	159
New York	71	79	0	0	0	82	13	13	5	218	1, 277
Rochester	4	8	0	0	0	1	0	0	0	9	52
Syracuse	4	3	0	0	0	1	0	0	0	19	35
New Jersey:											
Camden	1	2	0	0	0	0	0	0	0	2	23
Newark	10	12	0	0	0	9	1	0	0	98	87
Trenton	1	1	0	0	0	1	0	0	0	7	35
Pennsylvania:											
Philadelphia	38	46	0	0	0	25	3	4	0	67	378
Pittsburgh	15	34	0	0	0	6	1	0	0	60	154
Reading	2	0	0	0	0	0	0	0	0	1	26
EAST NORTH CENTRAL											
Ohio:											
Cincinnati	6	9	1	0	0	8	1	0	0	8	161
Cleveland	19	5	0	0	0	12	1	0	0	61	182
Columbus	3	2	0	0	0	5	0	0	0	1	79
Toledo	6	1	0	0	0	4	0	0	0	40	70
Indiana:											
Fort Wayne	1	0	0	0	0	0	0	1	0	1	27
Indianapolis	4	2	4	2	0	8	0	1	0	22	--------
South Bend	1	0	0	0	0	0	0	0	0	0	9
Terre Haute	0	0	0	0	0	0	0	0	0	5	12
Illinois:											
Chicago	59	63	1	0	0	45	3	5	0	92	691
Springfield	1	3	0	0	0	0	0	0	0	0	15
Michigan:											
Detroit	45	51	1	0	0	24	2	2	0	209	243
Flint	6	3	0	0	0	1	0	0	0	2	22
Grand Rapids	5	1	0	0	0	2	0	0	0	14	17
Wisconsin:											
Kenosha	0	2	0	0	0	0	0	0	0	0	2
Milwaukee	11	5	0	0	0	5	0	0	0	66	95
Racine	2	2	0	0	0	0	0	0	0	15	12
Superior	2	0	0	0	0	0	0	0	0	0	9
WEST NORTH CENTRAL											
Minnesota:											
Duluth	4	0	0	0	0	2	0	0	0	0	21
Minneapolis	15	5	0	0	0	2	1	0	0	7	108
St. Paul	9	2	0	0	0	7	0	2	0	37	66
Iowa:											
Davenport	0	1	0	10	--------	--------	0	0	--------	0	--------
Des Moines	2	2	1	1	--------	--------	0	0	--------	1	22
Sioux City	1	3	0	0	--------	--------	0	0	--------	3	--------
Waterloo	0	2	1	0	--------	--------	0	0	--------	2	--------

City reports for week ended July 11, 1931—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths all causes
WEST NORTH CENTRAL—contd.											
Missouri:											
Kansas City	3	1	1	0	0	5	1	1	0	12	85
St. Joseph	0	0	0	0	0	0	0	1	0	0	36
St. Louis	11	8	1	0	0	10	3	5	0	88	187
North Dakota:											
Fargo	0	0	0	1	0	0	0	0	0	6	8
Grand Forks	0	0	1	0	--------	--------	0	0	--------	0	--------
South Dakota:											
Aberdeen	0	1	0	0	--------	--------	0	0	--------	0	--------
Sioux Falls	0	0	0	0	--------	--------	0	0	--------	0	--------
Nebraska:											
Omaha	1	1	1	0	0	2	0	0	0	5	46
Kansas:											
Topeka	0	1	0	0	0	0	0	0	0	6	14
Wichita	1	0	0	1	0	1	0	1	0	0	32
SOUTH ATLANTIC											
Delaware:											
Wilmington	1	1	0	0	0	1	0	0	1	1	21
Maryland:											
Baltimore	13	6	0	0	0	7	3	3	1	53	--------
Cumberland	0	0	0	0	0	0	0	0	0	0	12
Frederick	0	0	0	0	0	0	0	0	0	0	4
District of Columbia:											
Washington	8	11	0	0	0	13	1	0	0	25	134
Virginia:											
Lynchburg	0	0	0	0	0	0	0	2	0	1	15
Norfolk	0	0	1	0	0	1	0	5	0	9	--------
Richmond	1	1	0	0	0	4	1	1	0	0	46
Roanoke	0	0	0	0	0	0	0	1	0	2	14
West Virginia:											
Charleston	0	0	1	0	0	0	0	0	0	3	19
Wheeling	1	0	0	0	0	2	1	1	0	2	18
North Carolina:											
Raleigh	0	0	0	0	0	1	0	0	0	9	16
Wilmington	0	0	0	0	0	1	0	0	0	3	11
Winston-Salem	0	0	0	0	0	1	1	0	0	19	18
South Carolina:											
Charleston	0	0	0	0	0	1	1	1	0	0	30
Columbia	0	0	0	0	0	6	1	1	0	0	45
Georgia:											
Atlanta	2	6	1	2	0	10	1	0	0	4	99
Brunswick	0	0	0	0	0	0	0	0	0	0	2
Savannah	0	0	0	0	0	3	2	2	1	0	45
Florida:											
Miami	0	0	0	0	0	1	1	1	1	1	23
St. Petersburg	0	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
Tampa	1	0	0	0	0	0	0	2	0	0	21
EAST SOUTH CENTRAL											
Kentucky:											
Covington	0	2	0	0	0	0	0	0	0	0	20
Tennessee:											
Memphis	2	1	0	1	0	3	6	5	0	30	68
Nashville	1	0	0	0	0	4	4	0	0	8	53
Alabama:											
Birmingham	1	6	0	0	0	6	2	4	1	9	84
Mobile	0	0	0	0	0	1	1	1	0	2	21
Montgomery	0	0	0	0	--------	--------	1	0	--------	1	--------
WEST SOUTH CENTRAL											
Arkansas:											
Fort Smith	0	0	0	0	--------	--------	0	0	--------	9	--------
Little Rock	0	0	0	0	0	6	0	9	1	0	--------
Louisiana:											
New Orleans	3	4	0	3	0	9	3	3	1	2	159
Shreveport	0	0	0	0	0	4	1	0	2	6	43

City reports for week ended July 11, 1931—Continued

Division, State, and city	Scarlet fever: Cases, estimated expectancy	Scarlet fever: Cases reported	Smallpox: Cases, estimated expectancy	Smallpox: Cases reported	Smallpox: Deaths reported	Tuberculosis, deaths reported	Typhoid fever: Cases, estimated expectancy	Typhoid fever: Cases reported	Typhoid fever: Deaths reported	Whooping cough, cases reported	Deaths, all causes
WEST SOUTH CENTRAL—contd											
Oklahoma:											
Muskogee	0	0	0	0	0	0	0			0	
Oklahoma City	0	1	0	0	0	1	2	0	0	1	27
Texas:											
Dallas	2	2	1	0	0	2	2	9	1	9	71
Fort Worth	2	3	1	0	0	0	1	2	2	0	19
Galveston	0	0	0	0	0	0	0	0	0	0	13
Houston	0	3	0	0	0	2	1	2	2	0	86
San Antonio	0	1	0	0	0	6	0	1	0	0	59
MOUNTAIN											
Montana:											
Billings	0	0	0	0	0	0	0	0	0	0	4
Great Falls	1	0	1	0	0	0	0	0	0	6	7
Helena	1	0	0	0	0	0	0	0	0	0	3
Missoula	0	1	0	0	0	0	0	0	0	0	3
Idaho:											
Boise	0	0	0	0	0	0	0	1	0	3	8
Colorado:											
Denver	6	4	0	0	0	7	0	0	0	40	73
Pueblo	0	0	0	0	0	1	0	1	0	5	13
New Mexico:											
Albuquerque	0	0	0	0	0	2	0	0	0	0	10
Arizona:											
Phoenix	0	0	0	0	0	1	0	0	0	0	
Utah:											
Salt Lake City	1	1	0	0	0	3	0	2	0	18	36
Nevada:											
Reno	0	0	0	0	0	1	0	0	0	0	14
PACIFIC											
Washington:											
Seattle	4	4	1	0			1	0		45	
Spokane	2	0	1	3			0	0		7	
Tacoma	1	0	1	0	0	0	0	0	0	7	26
Oregon:											
Portland	2	0	6	6	0	4	0	0	0	4	55
Salem	0	0	0	0	0	0	0	0	0	0	0
California:											
Los Angeles	15	16	3	1	0	23	2	1	0	23	297
Sacramento	1	0	1	0	0	3	1	1	0	3	
San Francisco	8	5	1	0	0	8	0	1	1	13	126

Division, State, and city	Meningococcus meningitis: Cases	Meningococcus meningitis: Deaths	Lethargic encephalitis: Cases	Lethargic encephalitis: Deaths	Pellagra: Cases	Pellagra: Deaths	Poliomyelitis (infantile paralysis): Cases, estimated expectancy	Poliomyelitis (infantile paralysis): Cases	Poliomyelitis (infantile paralysis): Deaths
NEW ENGLAND									
New Hampshire:									
Concord	0	0	0	0	0	1	0	0	0
Massachusetts:									
Boston	0	0	0	0	1	1	0	4	1
Rhode Island:									
Providence	0	0	0	0	0	0	0	1	0
Connecticut:									
Hartford	1	0	0	0	0	0	0	0	0
New Haven	0	0	0	0	0	0	0	4	0
MIDDLE ATLANTIC									
New York:									
Buffalo	0	0	0	0	0	0	0	1	0
New York	8	4	3	1	0	0	3	31	2
New Jersey:									
Newark	1	0	1	0	0	0	0	3	0
Pennsylvania:									
Philadelphia	0	1	0	1	2	0	0	0	0

City reports for week ended July 11, 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
Cleveland	1	0	0	0	0	0	0	0	0
Indiana:									
Fort Wayne	1	0	0	0	0	0	0	0	0
Indianapolis [1]	2	2	0	0	0	0	0	0	0
Illinois:									
Chicago	5	3	0	0	0	0	0	0	0
Michigan:									
Detroit	0	0	1	0	0	0	0	1	0
Wisconsin:									
Milwaukee	1	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL									
Minnesota:									
St. Paul	1	0	0	0	0	0	0	0	0
Missouri:									
St. Louis	1	0	0	0	0	0	0	2	0
Nebraska:									
Omaha	0	0	0	0	0	0	0	1	
SOUTH ATLANTIC									
Maryland:									
Baltimore	2	2	0	0	1	0	0	0	0
District of Columbia:									
Washington	2	0	0	0	0	0	0	0	0
North Carolina:									
Wilmington	0	0	1	0	1	0	0	0	0
South Carolina:									
Charleston	0	0	0	0	2	0	0	0	0
Columbia	1	0	0	0	0	2	0	0	0
Georgia:									
Atlanta	1	1	0	0	0	2	0	1	0
Savannah	0	0	0	0	6	2	0	0	0
Florida:									
Miami	0	0	0	0	1	1	0	0	0
EAST SOUTH CENTRAL									
Tennessee:									
Memphis	1	0	0	0	0	0	0	0	0
Alabama:									
Birmingham	0	1	0	1	1	1	0	0	0
Mobile	0	0	0	0	1	0	0	0	0
Montgomery	0	0	0	0	1	0	0	0	0
WEST SOUTH CENTRAL									
Arkansas:									
Little Rock	0	0	0	0	0	2	0	0	0
Louisiana:									
New Orleans	0	0	0	0	2	2	0	0	0
Texas:									
Dallas	0	0	0	0	0	0	1	1	0
San Antonio	1	1	0	0	0	0	0	0	0
MOUNTAIN									
Colorado:									
Denver	0	1	0	0	0	0	0	0	0
Utah:									
Salt Lake City	0	0	0	0	0	1	0	0	0
PACIFIC									
Oregon:									
Portland	1	0	0	0	0	0	0	0	0
California:									
Los Angeles	2	1	0	0	1	0	1	2	0
Sacramento	1	0	0	0	0	0	0	0	0

[1] Rabies in man: 1 death at Indianapolis, Ind.

The following tables give the rates per 100,000 population for 98 cities for the 5-week period ended July 11, 1931, compared with those for a like period ended July 12, 1930. The population figures used in computing the rates are estimated midyear 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, June 7 to July 11, 1931.—Annual rates per 100,000 population, compared with rates for the corresponding period of 1930 [1]

DIPHTHERIA CASE RATES

	Week ended—									
	June 13, 1931	June 14, 1930	June 20, 1931	June 21, 1930	June 27, 1931	June 28, 1930	July 4, 1931	July 5, 1930	July 11, 1931	July 12, 1930
98 cities	54	78	66	66	54	65	[2] 47	57	43	58
New England	41	39	41	39	67	68	96	56	60	41
Middle Atlantic	55	78	65	77	47	62	53	56	50	49
East North Central	64	128	89	92	72	97	[3] 51	91	41	86
West North Central	61	60	52	35	42	72	33	37	31	68
South Atlantic	49	44	43	36	45	26	[4] 12	26	18	32
East South Central	17	12	6	12	23	12	12	36	23	24
West South Central	27	80	85	80	68	35	27	49	61	59
Mountain	35	35	26	9	9	0	[5] 9	9	17	26
Pacific	53	36	71	47	51	54	51	32	41	53

MEASLES CASE RATES

	June 13, 1931	June 14, 1930	June 20, 1931	June 21, 1930	June 27, 1931	June 28, 1930	July 4, 1931	July 5, 1930	July 11, 1931	July 12, 1930
98 cities	876	815	723	642	568	489	[2] 347	270	316	252
New England	601	1,546	635	1,144	438	832	402	544	351	460
Middle Atlantic	838	1,033	663	776	511	607	283	322	311	305
East North Central	1,304	453	1,178	377	921	331	[3] 643	168	527	154
West North Central	448	370	331	302	296	269	143	139	103	130
South Atlantic	1,102	397	766	411	591	256	[4] 310	180	259	142
East South Central	820	161	844	239	588	227	349	126	116	179
West South Central	149	94	88	77	47	17	24	24	27	17
Mountain	705	3,410	609	2,687	479	1,454	[5] 215	731	122	582
Pacific	580	1,340	302	1,069	362	798	149	451	182	482

SCARLET FEVER CASE RATES

	June 13, 1931	June 14, 1930	June 20, 1931	June 21, 1930	June 27, 1931	June 28, 1930	July 4, 1931	July 5, 1930	July 11, 1931	July 12, 1930
98 cities	269	188	221	141	168	107	[2] 104	75	79	71
New England	291	218	272	126	238	135	188	73	142	73
Middle Atlantic	318	147	280	112	194	85	135	54	89	49
East North Central	386	301	310	226	240	182	[3] 121	115	90	114
West North Central	168	238	132	151	78	99	31	105	44	85
South Atlantic	122	158	77	106	93	68	[4] 54	62	49	68
East South Central	169	48	93	60	64	54	47	12	52	42
West South Central	88	35	30	98	30	38	41	45	34	35
Mountain	96	132	78	203	96	62	[5] 36	167	52	88
Pacific	80	97	57	73	57	49	47	38	49	43

[1] The figures given in this table are rates per 100,000 population, annual basis, and not the number of cases reported. Populations used are estimated as of July 1, 1931 and 1930, respectively.
[2] Milwaukee, Wis., Columbia, S. C., and Billings, Mont., not included.
[3] Milwaukee, Wis., not included.
[4] Columbia, S. C., not included.
[5] Billings, Mont., not included.

Summary of weekly reports from cities, June 7 to July 11, 1931.—Annual rates per 100,000 population, compared with rates for the corresponding period of 1930— Continued

SMALLPOX CASE RATES

	Week ended—									
	June 13, 1931	June 14, 1930	June 20, 1931	June 21, 1930	June 27, 1931	June 28, 1930	July 4, 1931	July 5, 1930	July 11, 1931	July 12, 1930
98 cities	10	14	7	10	8	13	[2] 6	6	2	7
New England	0	0	5	0	0	0	0	0	2	0
Middle Atlantic	1	0	0	0	1	0	0	0	0	0
East North Central	12	11	5	7	5	10	[3] 8	5	1	9
West North Central	36	54	29	31	19	52	10	14	4	10
South Atlantic	0	8	14	2	12	10	[4] 0	2	4	0
East South Central	23	36	12	18	17	6	23	18	6	18
West South Central	24	21	20	24	30	21	24	0	10	7
Mountain	17	35	0	35	70	53	[5] 0	53	0	9
Pacific	25	49	16	36	6	43	14	32	8	36

TYPHOID FEVER CASE RATES

	June 13, 1931	June 14, 1930	June 20, 1931	June 21, 1930	June 27, 1931	June 28, 1930	July 4, 1931	July 5, 1930	July 11, 1931	July 12, 1930
98 cities	7	9	9	8	10	13	[2] 10	10	14	16
New England	0	10	10	0	0	10	10	7	2	5
Middle Atlantic	7	8	12	4	4	5	5	5	8	10
East North Central	4	4	4	2	6	10	[3] 3	1	5	6
West North Central	4	6	6	8	10	14	10	8	19	10
South Atlantic	14	16	14	24	16	40	[4] 10	28	28	60
East South Central	17	24	12	48	35	60	41	84	58	84
West South Central	24	17	14	24	54	31	71	45	81	35
Mountain	9	9	0	9	52	35	[5] 36	0	35	0
Pacific	12	16	10	6	14	4	4	4	6	14

INFLUENZA DEATH RATES

	June 13, 1931	June 14, 1930	June 20, 1931	June 21, 1930	June 27, 1931	June 28, 1930	July 4, 1931	July 5, 1930	July 11, 1931	July 12, 1930
91 cities	4	6	7	4	4	3	[2] 3	4	3	3
New England	0	2	7	2	2	0	0	2	2	0
Middle Atlantic	4	5	8	5	2	2	1	4	4	4
East North Central	4	6	5	4	6	2	[3] 1	2	2	3
West North Central	6	15	6	0	0	0	9	0	0	6
South Atlantic	6	2	4	2	6	6	[4] 4	6	4	2
East South Central	13	13	0	13	6	13	19	6	6	13
West South Central	3	25	14	7	7	11	10	14	7	7
Mountain	0	0	9	0	0	0	[5] 9	0	0	0
Pacific	5	5	5	0	2	2	5	7	0	2

PNEUMONIA DEATH RATES

	June 13, 1931	June 14, 1930	June 20, 1931	June 21, 1930	June 27, 1931	June 28, 1930	July 4, 1931	July 5, 1930	July 11, 1931	July 12, 1930
91 cities	75	83	70	72	67	66	[2] 64	54	59	53
New England	60	89	65	75	60	53	36	36	79	44
Middle Atlantic	88	96	72	78	76	71	67	55	59	54
East North Central	60	66	60	52	51	56	[3] 61	40	47	37
West North Central	71	78	106	111	38	87	77	63	88	75
South Atlantic	83	80	89	70	103	72	[4] 67	60	71	60
East South Central	145	97	82	117	139	91	82	142	50	71
West South Central	79	100	76	64	90	85	90	78	86	78
Mountain	70	88	78	132	35	79	[5] 72	62	61	106
Pacific	43	57	34	60	41	45	46	52	31	50

[2] Milwaukee, Wis., Columbia, S. C., and Billings, Mont., not included.
[3] Milwaukee, Wis., not included.
[4] Columbia, S. C., not included.
[5] Billings, Mont., not included.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—Week ended July 4, 1931.—The Department of Pensions and National Health of Canada reports cases of certain communicable diseases for the week ended July 4, 1931, as follows:

Province	Cerebrospinal fever	Smallpox	Typhoid fever
Prince Edward Island [1]			
Nova Scotia [1]			
New Brunswick			1
Quebec			10
Ontario	2	3	6
Manitoba [1]			
Alberta			4
British Columbia			1
Total	2	3	22

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

Quebec Province—Communicable diseases—Week ended July 11, 1931.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the week ended July 11, 1931, as follows:

Disease	Cases	Disease	Cases
Chicken pox	15	Ophthalmia neonatorum	1
Diphtheria	31	Scarlet fever	28
Erysipelas	5	Tuberculosis	46
German measles	1	Typhoid fever	12
Measles	109	Whooping cough	35
Mumps	1		

Ontario—Communicable diseases—Comparative—Four weeks ended June 27, 1931.—The Department of Health of the Province of Ontario, Canada, reports certain communicable diseases for the four weeks ended June 27, 1931, and the corresponding period of 1930, as follows:

Disease	1930		1931	
	Cases	Deaths	Cases	Deaths
Cerebrospinal meningitis	11	5	10	5
Chancroid	6			
Chicken pox	836		812	
Conjunctivitis			2	
Diphtheria	237	7	110	9
Dysentery				1
German measles	429		96	
Goiter	1			
Gonorrhea	130		1,212	
Erysipelas	2			
Influenza	13	3	3	2
Lethargic encephalitis	1	1		
Measles	1,319		770	1
Mumps	130		291	
Paratyphoid fever	5		9	
Pneumonia		130		90
Poliomyelitis	2		3	2
Puerperal septicemia		2		
Scarlet fever	511	2	449	5
Septic sore throat	1		1	1
Smallpox	47		[1] 21	
Syphilis	122		86	2
Tetanus		1		1
Trachoma	1			
Tuberculosis	129	48	156	38
Typhoid fever	30		43	
Undulant fever	11		10	
Whooping cough	232		271	

[1] Smallpox was reported in the following municipalities; Harley, 14; Brantford, 3; and one each in Toronto, Ottawa, N. Fredericksburg, and Perry Township.

MEXICO

Tampico—Communicable diseases—June, 1931.—During the month of June, 1931, certain communicable diseases were reported in Tampico, Mexico, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	5	2	Measles	13	6
Enteritis (various)		57	Tuberculosis	40	34
Influenza	6		Typhoid fever	5	5
Malaria	158	14	Whooping cough	32	1

PANAMA CANAL ZONE

Communicable diseases—May, 1931.—During the month of May, 1931, certain communicable diseases, including imported cases, were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Chicken pox	6		Pneumonia		20
Diphtheria	4		Scarlet fever	2	
Dysentery (amebic)	2		Tuberculosis		29
Malaria	226	2	Typhus fever	1	
Measles	25		Whooping cough	4	
Meningococcus meningitis	2	1			

PORTO RICO

San Juan—Communicable diseases—Four weeks ended June 20, 1931.—During the four weeks ended June 20, 1931, cases of certain communicable diseases were reported in San Juan, Porto Rico, as follows:

Disease	Cases [1]	Disease	Cases [1]
Diphtheria	2	Malaria	22
Erysipelas	1	Whooping cough	19
Influenza	32		

[1] Report for the week ended May 23, 1931, has not been received.

VIRGIN ISLANDS

Communicable diseases—June, 1931.—During the month of June, 1931, cases of certain diseases were reported in the Virgin Islands as follows:

St. Thomas and St. John:	Cases
Gonorrhea	1
Syphilis	8
Tuberculosis	1

St. Croix:	Cases
Chicken pox	1
Gonorrhea	1
Syphilis	4
Uncinariasis	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		Jan. 11–Feb. 7, 1931	Feb. 8–Mar. 7, 1931	Mar. 8–Apr. 4, 1931	Week ended—													
					April, 1931			May, 1931					June, 1931				July, 1931	
					11	18	25	2	9	16	23	30	6	13	20	27	4	11
Ceylon: Colombo	C			1								1	1					
	D											1	1					
China:																		
Canton	C				1										1			
	D										1							
Swatow	C													3	1	6		
Tientsin	C											1						
	D											1						
India	C	15,334	11,544	8,968	3,161	3,067	2,668	2,566	3,242	3,013	3,565	3,784						
	D	8,123	6,131	4,550	1,571	1,550	1,360	1,286	1,806	1,598	1,845	2,021						
Bombay	C	21			2													1
	D	9			1													
Calcutta	C	121	170	436	95	82	62	71	72	89	49	55	94	74	50	74	72	
	D	86	112	256	55	51	26	44	39	44	34	32	57	47	26	38	35	
Karikal	C		9	12	10	8	1		10		1	1						
	D		8	12	5	8	1		5		1	1						
Madras	C	99	72	20	3	1	4	18	18	23	11		3	6				2
	D	47	29	10	5	1	3	5	6	8	2	1		4				
Negapatam	D	3	3															
Rangoon	C											2		2		2		
	D	1										1		1		1		
Tuticorin	C	1	1															
Vizagapatam	C															1		
India (French):																		
Chandernagor	C	1	5	7	3	2	1		3		1			1	2			
	D	1	5	6	3	2			3		1			1	2			
Pondicherry	C	19	100	100	5	3	5	11	3	8	2	4	1	1	1			
	D	11	34	18	1	3				8		4	1	1	1			

Indo-China (see also table below):																		
Pnompenh	C	4	9		1	1							1					1
	D	2	5	1			1		2				1					1
Saigon and Cholon	C	6	4	5	2	3	7	15	25	23	34	22	18	16	14	13	8	3
	D	3	4	5		3	6	13	20	18	25	13	9	14	9	9	3	2
Persia: Rafsanjan [1]	C								31	1	4							
	D								12		2							
Philippine Islands: [2]																		
Iloilo	C	2																
	D	2																
Provinces—																		
Capiz	C	59	186	48		3	8	18	11	3		3	4					
	D	47	146	41		3	8	13	11	3		1	4					
Iloilo	C	145	95	7									8	7	5	6	24	3
	D	110	65	4									6	5	6	4	22	3
Masbate	C			21														
	D			9														
Negros, Occidental	C	90	4													2		
	D	56	4													1		
Negros, Oriental	C	1																
	D	1																
Pampanga	C								1									
Siam	C	3	1	10	1	1	1	13	11	2	1			1	3			
	D	1		2				4	3	1	1			1	1			
Ayudhaya District	C			1														
Bangkok	C	3	2	3	1		1	1	1	1	1					1	1	
	D	1	1	2			1	1			1					1		
Bismulok Province	C			8														
	D			2														
On vessel:																		
S. S. Arankola, at Rangoon from Culcutta	C											1						
S. S. City of Eastborne, at Calcutta from Cocanada	C												1					
S. S. Tairea, at Penang from Calcutta	C													1				

Place		December, 1930	January, 1931	February, 1931			March, 1931			April, 1931			May, 1931			June, 1931	
				1-10	11-20	21-28	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20
Indo-China (French) (see also table above):																	
Cambodia [3]	C	28	62	71	35	19	14		65	36	22			44	40	83	96
Cochin-China [3]	C	8	24	5	5	19	39	33	33	22	40		1	52	75	71	69

[1] From May 3 to 25, 1931, 152 cases of cholera with 75 deaths were reported in Rafsanjan and vicinity, Karman district, Persia.
[2] Figures for cholera in the Philippine Islands are subject to correction.
[3] Reports incomplete.

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

PLAGUE

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

Place		Jan. 11–Feb. 7, 1931	Feb. 8–Mar. 7, 1931	Mar. 8–Apr. 4, 1931	Week ended—														
					April, 1931			May, 1931					June, 1931				July, 1931		
					11	18	25	2	9	16	23	30	6	13	20	27	4	11	18
Algeria:																			
Algiers	C	2	1	1															
	D			1															
Bone	C	1											1						
Constantine, vicinity of	C	1	1																
	D	1																	
Argentina:																			
Cordoba Province	C	1	2																
Entre Rios Province—Diamante	C		2																
Jujuy Province—Palpala	C	1	1																
Santa Fe	C		2																
Belgian Congo	C			2										1					
	D			2										1					
British East Africa (see also table below):																			
Tanganyika	C		22	8			3	15	17	5	7	17	4						
	D		4	1			10	11	11	2	8	9	2						
Uganda	C	25	15	19	8	3	10	14	11	33	31	63							
	D	24	15	19	8	3	9	12	11	26	28	61							
Ceylon: Colombo	C	8	11	8	1	3			1	1		1		1					
	D	6	13	7	1	2			1	1		1		1					
Plague-infected rats		2	3	4		1					5								
China: Amoy [1]	C								1										
	D								1										
Dutch East Indies:																			
Batavia and West Java	C	180	141	84	19	24	20	11	18	12	14	15	15						
	D	168	128	80	18	23	20	10	18	12	14	15	15						
East Java and Madura	C	4	1	4			1		1										
	D	4	1	4			1		1										
Java and Madura	D	427	376	277	58	73	70	42	47	41	46	42	41	48	45				
Egypt:																			
Alexandria	C	1	2	1											3	1	1	1	2
	D														3	1	1		
Plague-infected rats		1	1																
Assiout	C	26	41	13	5	16	8	3	4	5	8	1	4		5	2			
	D	6	11	6		11	4	2	2	4	1					1			
Beni-Suef	C	1					10	2	3		2								
	D	1					3		1		2								

Cairo	C			1															
Deirout	C	21	16					3	7	1		2	3						
	D	4	4					1	2	2			1						
Gharbieh	C	1												1					
	D	1												1					
Girga	C	1		86	31	9	4		1	1	5						1		
	D	1		24	13	3	5	1	1	1									
Kena	C			5			3				1								
	D			2			1				1								
Manfalut	C	30	15	17															
	D	6	5	3															
Minieh	C	2		3		1			5		1		3				10		2
	D	1		2					2		1		1				2		1
Port Said	C													1	1	1	1	1	2
	D										1				1	1	1		
Hawaii Territory: Hamakua—Plague-infected rats											1								
India	C	5,335	5,457	9,139	2,503	1,603	1,258	778	434	139	130	49							
	D	3,422	3,661	7,037	1,980	1,377	1,092	750	385	143	131	33							
Bassein	C	4	1					1			1						1		
	D	3	1					1			1						1		
Bombay	C	1	1	4	4	4	1	2	5		1	1					1		
	D	1	1	3	4	4		3	4	1	1								
Plague-infected rats		34	32	70	34	43	30	30	26	30	17	21	10	10	10	7	11		
Calcutta	C				1	1													
	D				1	1													
Madras Presidency	C	312	74	23	3				1	1				1					
	D	182	46	21	2					1				1					
Rangoon	C	2		1	1				1			1		1					
	D	1		1	1				1			1		1					
Plague-infected rats		4	8	7	1	3			1	1	3	2		3			1		
Indo-China (see also table below): Pnompenh	C	7	1										1		1				
	D	7	4	6	2	1	1						1		1				
Iraq:																			
Baghdad	C	5	3	8		5	10	8	7	10	4	2	10	6	1	6	1	1	
	D	4	2	5		2	5	1	3	4	2		1	4	1	3	1		
Maudhan	C											2							
Madagascar (see also table below): Tamatave	C	9																	
Morocco	C	13																	
	D	4																	
Nigeria: Lagos	C	1			2	2	1												
	D	1			2	2	·1												
Plague-infected rats					3	3													
Peru (see table below).																			
Senegal (see table below).																			
Siam	C	4	18	31	1				1			1	1						
	D	2	14	7	1				1			1	1						
Bangkok	C	8	6	29															
	D	8	5	6															
Nagara Rajsima	C	9	7	1															
	D	10	6																

[1] On July 23, 1931, an indirect report was received stating that an epidemic of plague had occurred in Chiobe and Changchow, China, not far from Amoy.

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

PLAGUE—Continued

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

Place		Jan. 11–Feb. 7, 1931	Feb. 8–Mar. 7, 1931	Mar. 8–Apr. 4, 1931	Week ended— April, 1931: 11	18	25	May, 1931: 2	9	16	23	30	June, 1931: 6	13	20	27	July, 1931: 4	11	18
Syria: Beirut	C	1	1															1	
Tripolitania	C	8	1																
	D	3																	
Tunisia: Tunis	C	1	14	10	5	7		4	7		8	1		8	2	1			
	D		7	4	4	2		2	3					1					
Union of Socialist Soviet Republics:																			
Gouranduz	D	28																	
Transcaucasia—Karabakh	C	6																	
Union of South Africa:																			
Cape Province	C				2	1													
Orange Free State	C	P	1	6	1	1					1	1							
	D		1	1	1	1						2							

Place		Jan., 1931	Feb., 1931	Mar., 1931	Apr., 1931	May, 1931	June, 1931
British East Africa (see also table above):							
Kenya	C	69	21	7	345	245	
Indo-China (see also table above)	C			4	2		2
Madagascar (see also table above):							
Ambositra Province	C	100	92	70	30		
	D	96	88	66	29		
Antisirabe Province	C	66	84	83	48		
	D	57	79	74	47		
Miarinarivo Province	C	28	31	19	6		
	D	26	29	19	6		
Moramanga Province	C	7	7	1			
	D	5	7	1			
Tananarive Province	C	92	145	90	41		
	D	89	139	81	40		

Place		Jan., 1931	Feb., 1931	Mar., 1931	Apr., 1931	May, 1931	June 1931,
Peru	C	29	12				
	D	8	6				
Senegal:							
Baol [1]	C					4	
	D					3	
Dakar [1]	C				2	63	64
	D				1	49	56
Louga [1]	C			14	1	5	
	D			6		2	
Rufisque [1]	C		2			1	2
Thies [1]	C						12
	D						3
Tivaouane [1]	C				4	19	3
	D					11	2

[1] Reports incomplete.

SMALLPOX

Place		Dec. 14, 1930–Jan. 10, 1931	Jan. 11–Feb. 7, 1931	Feb. 8–Mar. 7, 1931	Mar. 8–Apr. 4, 1931	Week ended— April, 1931 11	18	25	May, 1931 2	9	16	23	30	June, 1931 6	13	20	27	July 4, 1931
Algeria:																		
Algiers	C	1	1	1	2		2					1			7	1		
Bone	C		1															
Constantine	C				1					1								1
Arabia: Aden	C		1	1														
Belgian Congo	C	79	50								7	10						
Belgium	C			1														
Brazil: Porto Alegre (alastrim)	C		3	7	49	20	19	8	6	2	4	7	6	2	3			
	D			1	1									1				
British East Africa: Tanganyika	C	84	70	91	8						13							
	D	4	5	13	3													
British South Africa: Southern Rhodesia	C	18	13												1			
Canada:																		
Alberta	C	19	7	1														
British Columbia	C	3	2	8														
Manitoba	C		1	1						4								
Winnipeg	C	1		1														
Nova Scotia	C		1		1													
Ontario	C	17	49	29	9	4		6	7	17	5		3		4	3	14	8
Kingston	C	6	1	1				2	3									
North Bay	C	2		1														
Ottawa	C	2	3	1												1		
Sault Ste. Marie	C	1	30	2		3	1				1							
Toronto	C				2		4			1						1		
Quebec	C		2															1
Saskatchewan	C		38	63	58	5	16	3	22	7	15	18	8	7	16	18	13	
Regina	C			1	2			2		2								
Canary Islands: Las Palmas	C				1													
Chile: Chanaral	C												1					
China:																		
Amoy	C				1				2	2	1	1	2	1	2		1	
	D				1				1	1		1	1	1	1		1	
Canton	C			3	7	1	2	1				1	2			1		1
Chungking	C	2																
Foochow	C	P	P	P	P	P			P				P		P			
Hong Kong	C	1	1	9	2		1	2					1					
	D			8	2			1		1			1					
Manchuria—																		
Harbin	C		1	4	2					1	1		1					
Kwantung—Dairen	C	1			2			1	1	1			1	1				

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

SMALLPOX—Continued

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

Place		Dec. 14, 1930–Jan. 10, 1931	Jan. 11–Feb. 7, 1931	Feb. 8–Mar. 7, 1931	Mar. 8–Apr. 4, 1931	Week ended—												
						April, 1931			May, 1931					June, 1931				July 4, 1931
						11	18	25	2	9	16	23	30	6	13	20	27	
China—Continued.																		
Nanking	C	P	P	P	P	P	P	P	P	P	P	P						
Shanghai—																		
Foreigners only	C	14	12	16	6	2	1	2	2	1	4	1	1	2	6	2		2
Including natives	D	11	13	14	10	2	7	4	5	1		3	3	1	5	4	3	2
Swatow	D	5	7	13	26	2												
Tientsin	C		1							2								
Chosen (see table below).																		
Colombia: Cali	D									1								
Dutch East Indies:																		
Batavia and West Java	C	4	29	2	1						1	1						
	D	2	2	1														
East Java and Madura	C												1					
Finland	C						1											
France (see table below).																		
Great Britain:																		
England and Wales	C	665	958	745	795	177	163	212	192	186	166	111	107	83	94	62	48	
Bradford	C	1	4	1	2	1		1	4	1	3	1	3			5		
Leeds	C	2			1		1	1		1		1						
London	C	161	140	98	147	51	39	84	53	66	44	37	36	25	50	31	16	
London and Great Towns	C	560	693	683	554	142	126	162	128	139	108	84	72	57	84	49	38	
	D			1		1		1						1				
Sheffield	C		3	32	10	4	2	1										
Stoke-on-Trent	C		1	1														
Greece (see table below).																		
Honduras:																		
Amapala	C			1														
Ocotopeque and Gracias districts	C			P														
Puerto Castilla	C	4	11	3														
Tegucigalpa	C							1										
Tela	C					1												
India	C	5,623	9,623	12,222	11,791	3,980	3,749	3,468	3,068	3,422	2,836	2,477	2,608					
	D	1,381	2,245	2,660	2,261	807	684	680	752	709	572	538	530					
Bassein	C												1					

Bombay	C	2	7	6	10	2	2	1	3	3		6	1		2			
	D	2	1	3	4	1			4	1	1	1	1		1			
Calcutta	C	59	143	251	283	101	60	61	65	24	30	19	16	14	19	14		11
	D	40	100	188	203	78	42	50	54	18	25	17	15	12	18	11		9
Cochin	C	15	29	59	46	10	11	12	6	3								
	D	1		3														
Karachi	C		3	4	4		5		1							2		
	D		2		2											1		
Madras	C	4	16	8	22	12	4	1	2	1	3	3	1			1		
	D			1	3	2	1	1	1		1	5						
Moulmein	C		2															
Negapatam	C					1	1		1							2	1	
Rangoon	C			4	3	2	2	1	6	7	5		1		1	4	1	2
	D				1				1	2	1	1	1		1		1	1
Vizagapatam	C		1	8	2	2	2	4	2			5	1	2	1		3	2
	D			2	1	1		1				1			1		1	1
India (French):																		
Chandernagor	C	5	9	12	14	3	1	4	2	3		4				1		
	D	3	1	1	2	3	1	2	1	3		2						
Karikal	C	3	5	19	3		1	1	2	1	1	1	1	1	2			
	D	2	4	18			1		2	1	1	1	1	1	2			
Pondicherry Province	C	34	45	19	14	3			3	1	2	7	1	3	2	1	1	
	D	32	45	19	14	3	3		3	1	2	7	1	3	2	1	1	
India (Portuguese)	C	4	5	14	8		19	2				3						
	D			3	3		4	2				1						
Indo-China (see also table below):																		
Pnompenh	C	2	1		1							1		2				
	D		1									1						
Saigon and Cholon	C		6	4	8	1					1		1					1
	D		4	1	8	1					1							1
Iraq:																		
Baghdad	C			9				1	1			1	2		1			
	D												2					
Basra	C												2		1			
Mosul Liwa	C	1	3	5														
	D			1														
Ivory Coast (see table below).																		
Japan:																		
Kobe	C			2														
Taiwan	C		1															
Mexico (see also table below):																		
Jalisco (State)—Guadalajara	D		1		1				1	1		1			1			1
Mexico City and surrounding territory	C	10		23	33	17	9	11	6	4	10	10	21	5	4	16		
	D	6	1	8	22	4	6	4		4	3	2	2	4	3	6		
Monterrey	C													1				
Torreon	C						1				1					1	2	
	D						2									1	1	
Vera Cruz	C			3	2		1		1	1								
Morocco (see table below).																		
Nicaragua: Porto Cabezas	C	2																
Nigeria: Lagos	C				2													
Panama Canal Zone	C		2															

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

SMALLPOX—Continued

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

Place		Dec. 14, 1930–Jan. 10, 1931	Jan. 11–Feb. 7, 1931	Feb. 8–Mar. 7, 1931	Mar. 8–Apr. 4, 1931	Week ended— April, 1931 11	18	25	May, 1931 2	9	16	23	30	June, 1931 6	13	20	27	July 4, 1931
Poland	C	25		1									3	1	1		1	
Portugal: Lisbon	C	72	103	40	52	8	18	11	19	19	14	16	18	5	17	12	14	15
Siam	C	1	4	2				1				3	3					
	D	1											1					
Spain	C	P	P	P	P													
Straits Settlements	C	6	7	2	4	1		9										
	D	3	1	1	1	1	1	3										
Sudan (Anglo-Egyptian)	C	64	11	97	8				3		3		1					
	D	6	7	10	2								1					
Sudan (French) (see table below).																		
Syria (see table below).																		
Tunisia: Tunis	C	17	8		4													
Turkey (see table below).																		
Union of South Africa:																		
Cape Province	C	P	P	P	P	P	P	P		P	P							
Orange Free State	C		P	P	P	P	P	P		P	P	P	P	P				
Transvaal	C	P	P	P	P													
Upper Volta	C	4		18	3		3			1	2		85	11		1		
	D	2			1								1					
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														
S. S. Rotterdam at Naples from Venice	C				1													
S. S. Clan McTavish at Manila from Chittagong	C						1											
S. S. Benevue at Sydney from Shanghai	C		1															
S. S. Clan MacBrayne at Cochin	C			1														
S. S. Chilka at Rangoon	C			1														
S. S. Taif (pilgrim ship) at Suakin from Jeddah	C								1									
S. S. Talodi at Suakin	C										1							

Place		December, 1930	January, 1931 1-10	January, 1931 11-20	January, 1931 21-31	February, 1931 1-10	February, 1931 11-20	February, 1931 21-28	March, 1931 1-10	March, 1931 11-20	March, 1931 21-31	April, 1931 1-10	April, 1931 11-20	April, 1931 21-30	May, 1931 1-10	May, 1931 11-20	May, 1931 21-31	June, 1931 1-10	June, 1931 11-20
Indo-China (see also table above)	C	61	47	48	46	95	46	27	125		139	100	42			17	41	30	16
Ivory Coast	C	9																	
Sudan (French)	C	139							4		P								
	D	20																	
Syria: Beirut	C			1															1

Place		Dec., 1930	Jan., 1931	Feb., 1931	Mar., 1931	Apr., 1931	May, 1931
Chosen	C		1		11		1
	D		1		3		
France	C		4	16	15		
Greece	C	4		4			3
Mexico (see also table above)	D	1		3		1	1
Morocco	C	25		4	6	7	49
Turkey	C	116	63	37	1		9
	D	9	7	6			

TYPHUS FEVER

Place		Dec. 14, 1930–Jan. 10, 1931	Jan. 11–Feb. 7, 1931	Feb. 8–Mar. 7, 1931	Mar. 8–Apr 4, 1931	Week ended— April, 1931 11	April, 1931 18	April, 1931 25	May, 1931 2	May, 1931 9	May, 1931 16	May, 1931 23	May, 1931 30	June, 1931 6	June, 1931 13	June, 1931 20	June, 1931 27	July, 1931 4	July, 1931 11
Algeria:																			
Algiers	C			2	3			2	1	3		1	3	4	4		1		
Constantine Department	C	6	31	4	3	2		6	1	8	3	5	6	6	3	1	16	2	
Oran	C		3	1				1					2	2					
Australia, Western	C	3			1					1									
Bulgaria	C	1	13	5	9		26	4			5	8	3	11	10				
	D				2		3				1		3	2					
Chile: Valparaiso	D			1															
China:																			
Canton	C		2		1														
Manchuria—Harbin	C		3	5	3			8											
Shanghai	C		2																
Tientsin	C					1	1												

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

TYPHUS FEVER—Continued

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

Place		Dec. 14, 1930–Jan. 10, 1931	Jan. 11–Feb. 7, 1931	Feb. 8–Mar. 7, 1931	Mar. 8–Apr. 4, 1931	Week ended— April, 1931			May, 1931					June, 1931				July, 1931	
						11	18	25	2	9	16	23	30	6	13	20	27	4	11
Chosen (see table below).																			
Czechoslovakia (see table below).																			
Egypt:																			
Alexandria	C						1								1	1			
Beheira Province	C	1				3	1												
	D	1				2													
Cairo	C	1	1																
Port Said	C		1																
Eritrea: Asmara	C				1														
Great Britain: Scotland	C		1																
Fife County	C												1						
Glasgow	C		2																
	D		1																
Greece (see table below).																			
Guatemala.[1]																			
Iraq: Baghdad	C			5	2					2									
	D			1						2									
Irish Free State:																			
Cork County—																			
Schull	C																		1
Skibbereen	C														1		1	1	
Kerry County—																			
Dingle	C									1									
Listowel	C																1		
Limerick County—																			
Limerick	C																	4	
Michelstown	C																	1	
Mayo County—Belmullet	C						1												
Latvia (see table below).																			
Lithuania (see table below).																			

Mexico (see also table below):																			
Durango	D		1																
Mexico City, including municipalities in Federal District	C	12	39	35	216	67	34	38	31	16	27	17	15	7	12	27			
	D	10	34	16	84	18	7	17	14	9	7	7	10	4	4	11			
San Luis Potosi	D			5	5	1	2					1	1						1
Morocco	C	8	8	28	7		1		12		13	29			31	42	28		
	D		2	1					1		2	2			2	3	1		
Palestine	C	4	2	3	5	1	2		2	2	1	1			2	3		2	
Panama Canal Zone—Balboa	C										1	1							
Paraguay: Asuncion	D		4	1	1														
Poland	C	63	106	189	287	93	176	140	129	92	81	58	67		48	33			
	D	3	8	19	15	8	7	6	7	6	4	5	3		2	1			
Portugal: Oporto	C		1																
Rumania	C	113	193	152	214	70				63	52	54		42					
	D	5	16	24	16	8				10	5	3		4					
Syria	C										1	3							
Tunisia:																			
Sbeitla, vicinity of	C				20	2			10										
	D				7														
Sfax	C				2														
Tunis	C		16	18	14	2		1	10	12	9	8			64	9			
	D									1	2				4				
Turkey (see table below).																			
Union of South Africa:																			
Cape Province	C	P	P	P	1	P	P	P		P	P	P	P	P	P				
Municipality of East London	C	3	3		P														
Natal	C	P	P	P	1	P	P	P	P	P		P	P	P	P				
Orange Free State	C	P	P	P	P	P	P	P			P	P	P	P	P				
Transvaal	C	P	P	P	P	P	P	P		P	P	P	P	P					
Yugoslavia (see table below).																			

Place		Dec., 1930	Jan., 1931	Feb., 1931	Mar., 1931	Apr., 1931	May, 1931	Place		Dec., 1930	Jan., 1931	Feb., 1931	Mar., 1931	Apr., 1931	May, 1931
Chosen: Seoul	C	1	1		3	4		Lithuania	C	6	26	3	99	34	10
Czechoslovakia	C	24	60	26		5			D	3	3	1	3	5	
Greece	C	10	10	17	8	22	6	Mexico (see also table above)	D	85	66	83			
	D		2	2	1	3		Turkey	C	2	17	18	15		8
Latvia	C			12				Yugoslavia	C	1	20	12	10	43	14
									D	1	2		1	5	

[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.

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

YELLOW FEVER

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

Place		Jan. 11–Feb. 7, 1931	Feb. 8–Mar. 7, 1931	Mar. 8–Apr. 4, 1931	Week ended— April, 1931: 11	18	25	May, 1931: 2	9	16	23	30	June, 1931: 6	13	20	27	July, 1931: 4	11	18
Brazil:																			
Bahia State	C			1															
Ceara State	C	1		2				2		1			1						
	D	1						2		1									
Minas Geraes State	C			2	1		2	2	1		1								
	D			1			1	1	1										
Rio de Janeiro State	C			1						1	1								
	D		1	2															
Cambucy	C	3	2	1															
	D	3	1																
Friburgo (imported)	C	1																	
Padua	C	2	1																
	D	2	1																
Sergipe State	C													1					
British Cameroons: Mamfe	C									3			1						
	D									2									
Gold Coast:																			
Akuse	C																2		
	D																1		
Kintampo	C																		1
	D																		1
Tamale	C																	2	
	D																	2	
Ivory Coast:																			
Bobo Dioulasso	C																	P	
Kong Circle	C																		4
Sudan (French)	C																		P