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MORBIDITY AMONG SCHOOL CHILDREN IN HAGERSTOWN, MD.

CASES OF ILLNESS AND DAYS LOST FROM SCHOOL ON ACCOUNT OF ILLNESS AMONG WHITE SCHOOL CHILDREN DURING THE SCHOOL MONTHS, DECEMBER, 1921, TO MAY, 1923, INCLUSIVE.[1]

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Of the total population of nearly 106,000,000 persons in the United States in 1920, about 33,000,000, or 31 per cent, were 5 to 20 years of age. Of the 33,000,000 children of school age, 65 per cent were actually attending school. Furthermore, the 22,000,000 children attending schools of one kind or another constituted nearly 20 per cent of the total population of the United States.[2] Considering school attendance as an occupation, these children comprise a large and more or less homogeneous industrial group. Little or nothing is known about the morbidity of this group except in the case of the notifiable diseases—largely the so-called communicable diseases of children.

In the autumn of 1921 the city of Hagerstown, Md., was selected by the United States Public Health Service as a fairly representative American community in which to study morbidity among school children. The investigation was carried on in cooperation with the Washington County Health Demonstration and the public school authorities of Hagerstown.

The population of Hagerstown, according to the census of 1920, was 28,064; of the total population, 93 per cent were native white and 88 per cent were native white of native parents, 5 per cent were negroes, and less than 2 per cent were foreign-born white.[3]

The school attendance in 1920 was 5,071. Of this number 92 per cent were native white children of native parents, 4 per cent were negroes, and 4 per cent were foreign born or children of foreign-born or mixed parentage.[4]

The method of collecting data.—In order to place as little additional work as possible on the teachers, whose time is as fully occupied in

[1] From Field Investigations in Child Hygiene, United States Public Health Service, in cooperation with the Statistical Office, United States Public Health Service.

[2] Fourteenth Census of the United States, 1920, Vol. II, pp. 34; 1043. Bureau of the Census, Department of Commerce.

[3] Idem, p. 322.

[4] Fourteenth Census of the United States, 1920, Vol. II, p. 1098.

Hagerstown as elsewhere, it was arranged that the reported data should be assembled in the office of the local representative of the United States Public Health Service. At the beginning of the school year a record was started for each child, and to this record was transferred the data submitted weekly by teachers, on a specially prepared form, showing the names of all the children who had been absent on account of sickness and had returned to school during the current week, together with the cause of the illness and the number of school days each child was absent. A record was also kept of all new entrants and withdrawals from school in order that an accurate count could be made of the number of children under observation at any given time or during the year as a whole. In other words, the records of sickness and of the days the child was enrolled (under observation) were brought together on a single card for each child, together with other data regarding sex, age, race, school grade, the character of school work, and the like.

It is fully realized that some children may have reported illness when they were not really sick. No investigation was made at home; but, as is usual in public schools, written excuses were required from the parents when a child returned after an absence from school. Every effort was made to eliminate false reports. A teacher, particularly in the lower grades, is usually familiar with a great many of the details of the lives of her pupils, and it is felt that she is therefore in a position to get an accurate report as to whether the absence was due to sickness or to some other cause. The diagnoses are, of course, only approximate and are stated in the language of the laity rather than in medical terms because they could not be made or confirmed by physicians.

Description of data.—Owing to unavoidable delay in starting the work, data for only six months of the 1921-22 school year were used. Records were kept for the whole of the 1922–23 school year and also for 1923–24. However, the present report includes only the data up to the end of the 1922–23 school year.

The 1921–22 data used in this study consist of the morbidity records of 3,712 white children. For the year 1922–23 the data consist of the records of 5,126 white children—practically all of the white children of school age in Hagerstown. Table 1 shows the sex and age distribution of the children under observation for each of the two school years. Age in this table and in all other tabulations in this study means age at nearest birthday as of the middle of the school year.

TABLE 1.—*Number and percentage distribution according to sex and age of children under observation for sickness during each school year—White school children of Hagerstown, Md.*

Age nearest birthday.	Number.						Percentage.					
	School year 1921-22.			School year 1922-23.			School year 1921-22.			School year 1922-23.		
	Both sexes.	Boys.	Girls.	Both sexes.	Boys.	Girls.	Both sexes.	Boys.	Girls.	Both sexes.	Boys.	Girls.
All ages	3,712	1,837	1,875	5,126	2,614	2,512	100.0	100.0	100.0	100.0	100.0	100.0
5	5	2	3	14	6	8	0.1	0.1	0.2	0.3	0.3	0.4
6	251	129	122	238	121	117	7.0	7.3	6.7	5.2	5.2	5.1
7	417	208	209	491	248	243	11.6	11.8	11.5	10.7	10.7	10.7
8	433	213	220	517	273	244	12.1	12.1	12.1	11.2	11.8	10.7
9	343	171	172	477	235	242	9.6	9.7	9.5	10.4	10.1	10.6
10	357	186	171	442	215	227	10.0	10.5	9.4	9.6	9.3	10.0
11	338	155	183	446	230	216	9.4	8.8	10.1	9.7	9.9	9.5
12	313	153	160	434	216	218	8.7	8.7	8.8	9.4	9.3	9.6
13	265	119	146	426	180	246	7.4	6.7	8.0	9.3	7.7	10.8
14	257	123	134	366	178	188	7.2	7.0	7.4	8.0	7.7	8.2
15	235	115	120	276	136	140	6.6	6.5	6.6	6.0	5.9	6.1
16	180	99	81	198	109	89	5.0	5.6	4.5	4.3	4.7	3.9
17	102	45	57	144	80	64	2.8	2.5	3.1	3.1	3.4	2.8
18	67	38	29	95	65	30	1.9	2.2	1.6	2.1	2.8	1.3
19	14	7	7	29	22	7	0.4	0.4	0.4	0.6	0.9	0.3
20	2	1	1	7	7	-------	0.1	0.1	0.1	0.2	0.3	-------
21	2	2	-------	2	2	-------	0.1	0.1	-------	-------	0.1	-------
Unknown age	131	71	60	524	291	233	-------	-------	-------	-------	-------	-------

It will be observed that the distribution of the children of each sex according to age is similar.

MORBIDITY FROM ALL CAUSES.

It is obvious that the morbidity can be measured and the importance of a single disease as a cause of absence from school can be assessed in a given population in two ways. According to one method the measure may be based on knowledge of the number of cases of illness occurring in the school population, and by the other on the time lost from school on account of these cases of illness. The rates based on these two sets of data may or may not be parallel. For example, a few cases of whooping cough or scarlet fever, diseases of more or less prolonged duration, may cause more loss of time from school than many cases of headache. This possibility suggests a third measure of morbidity—the days lost per case. This measure is a definite indicator of the seriousness of a disease from the standpoint of time lost from school.

Method of computation.—In computing the morbidity rates for this study, the advisability of basing them on the rate per 10,000 days enrolled[5] was considered because this method has the advantage of putting the rates on a comparable basis without further adjustment. The common practice in studies of morbidity and mortality among adults is to find the annual rate; in other words, no matter what

[5] See Appendix, Table 12, for rates on such a basis.

period is covered, to reduce the rate to the basis of a calendar year of 365 days by finding what the rate would be for a whole year. This latter method was not adopted, because to take the sickness occurring in the school months, which include the winter months with a higher sickness prevalence, and reduce it to a calendar-year basis does not seem to be a fair statement of the rate per calendar year. In this latitude more cases of sickness ordinarily occur in the winter than in the summer. It can not be assumed, therefore, that the rates continue the same during the summer as during the winter school months. It seems more desirable to reduce the rates to the basis of a school year; that is, to compute the rate per 1,000 children per full-time school year. It is particularly necessary to use a full-time school year because some children are entering and some are dropping out of the school from time to time during each semester.

The length of the school year varies in different cities. In some the term is 9 months and in others 10 months; but probably in a majority of them the term is 9 months with an average of 20 school days per month, or 180 school days in a school year. In Hagerstown, during the school year 1921–22, the actual number of days of school was 180, and in 1922–23, 184 days, exclusive of Saturdays, Sundays, and holidays. The computations in this study, however, are based on a school year of 180 school days, and the rates are computed as cases occurring per 1,000 school children for a full-time school year of 180 school days. Likewise, the rates for the school days lost were computed on the basis of 1,000 children per school year of 180 school days.

Morbidity rates.—The rates for all causes of illness are shown in Table 2, by sex and age, as is also the number of days lost per case of illness. For convenience of comparison with studies in which the rates are expressed in other ways,[6] the case rates per 100,000 days enrolled and the percentage of the total possible days of attendance which were lost on account of sickness are also shown.

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[6] Absenteeism among white and negro school children in Cleveland (Ohio) 1922-23. By G. E. Harmon and G. E. Whitman. Public Health Reports, vol. 39, No. 12, Mar. 21, 1924, pp. 559-567. (Reprint No. 908).

Absenteeism because of sickness in certain schools in Cleveland (Ohio) 1922-23. By G. E. Harmon and G. E. Whitman. Public Health Reports, vol. 39, No. 23, June 6, 1924, pp. 1359-1366. (Reprint No. 928.)

TABLE 2.—*Morbidity from all causes, by sex and age, among white school children of Hagerstown, Md., December, 1921, to May, 1923, inclusive.*

Sex.	All ages.	Age nearest birthday.											
		6 and under.	7	8	9	10	11	12	13	14	15	16 and over.	Unknown age.
CASES OF SICKNESS PER 1,000 CHILDREN PER SCHOOL YEAR OF 180 SCHOOL DAYS.													
Both sexes	2,333	2,848	2,779	2,721	2,541	2,297	2,134	2,300	2,106	2,073	1,887	1,995	2,091
Boys	2,194	2,536	2,901	2,657	2,451	2,037	2,054	2,210	1,890	1,899	1,784	1,659	1,950
Girls	2,476	3,171	2,656	2,790	2,629	2,557	2,213	2,387	2,268	2,237	1,989	2,449	2,267
SCHOOL DAYS LOST ON ACCOUNT OF SICKNESS PER 1,000 CHILDREN PER SCHOOL YEAR OF 180 SCHOOL DAYS.													
Both sexes	7,295	12,673	11,600	9,836	8,121	6,439	5,656	6,042	5,301	5,345	4,655	4,576	6,441
Boys	6,879	11,893	12,595	9,006	7,772	5,680	5,137	5,426	5,015	4,823	4,234	4,192	5,635
Girls	7,720	13,484	10,593	10,715	8,461	7,199	6,167	6,638	5,515	5,833	5,073	5,095	7,452
SCHOOL DAYS LOST PER CASE OF SICKNESS.													
Both sexes	3.13	4.45	4.17	3.61	3.20	2.80	2.65	2.63	2.52	2.58	2.47	2.29	3.08
Boys	3.14	4.69	4.34	3.39	3.17	2.79	2.50	2.46	2.65	2.54	2.37	2.53	2.89
Girls	3.12	4.25	3.99	3.84	3.22	2.82	2.79	2.78	2.43	2.61	2.55	2.08	3.29
CASES OF SICKNESS PER 100,000 DAYS ENROLLED.													
Both sexes	1,296	1,582	1,544	1,512	1,412	1,276	1,186	1,278	1,170	1,152	1,048	1,108	1,162
Boys	1,219	1,409	1,612	1,476	1,362	1,132	1,141	1,228	1,050	1,055	991	922	1,083
Girls	1,375	1,762	1,475	1,550	1,461	1,421	1,230	1,326	1,260	1,243	1,105	1,361	1,260
PERCENTAGE OF THE TOTAL POSSIBLE DAYS OF ATTENDANCE WHICH WERE LOST ON ACCOUNT OF SICKNESS.													
Both sexes	4.05	7.04	6.44	5.46	4.51	3.58	3.14	3.36	2.95	2.97	2.59	2.54	3.58
Boys	3.82	6.61	7.00	5.00	4.32	3.16	2.85	3.01	2.79	2.68	2.35	2.33	3.13
Girls	4.29	7.49	5.88	5.95	4.70	4.00	3.43	3.69	3.06	3.24	2.82	2.83	4.14

TABLE 2.—*Morbidity from all causes, by sex and age, among white school children of Hagerstown, Md., December, 1921, to May, 1923, inclusive*—Continued.

Sex.	All ages.	Age nearest birthday.											
		6 and under.	7	8	9	10	11	12	13	14	15	16 and over.	Unknown age.
NUMBER OF CASES OF SICKNESS.													
Both sexes	17,847	1,223	2,179	2,231	1,816	1,580	1,441	1,484	1,277	1,123	811	1,427	1,255
Boys	8,479	555	1,144	1,121	865	701	688	702	491	497	382	682	651
Girls	9,368	668	1,035	1,110	951	879	753	782	786	626	429	745	604
NUMBER OF DAYS LOST FROM SICKNESS.													
Both sexes	55,800.0	5,443.0	9,095.5	8,063.0	5,803.0	4,429.5	3,819.0	3,898.0	3,214.0	2,895.0	•2,000.5	3,273.0	3,866.5
Boys	26,588.0	2,602.5	4,967.0	3,800.0	2,742.5	1,955.0	1,721.0	1,723.5	1,303.0	1,262.5	906.5	1,723.0	1,881.5
Girls	29,212.0	2,840.5	4,128.5	4,263.0	3,060.5	2,474.5	2,098.0	2,174.5	1,911.0	1,632.5	1,094.0	1,550.0	1,985.0
NUMBER OF DAYS OF EXPOSURE.													
Both sexes	1,376,910	77,307	141,139	147,561	128,627	123,825	121,535	116,136	109,134	97,497	77,359	128,745	108,045
Boys	695,763	39,390	70,984	75,945	63,516	61,951	60,299	57,171	46,765	47,118	38,539	73,989	60,096
Girls	681,147	37,917	70,155	71,616	65,111	61,874	61,236	58,965	62,369	50,379	38,820	54,756	47,949
NUMBER OF FULLTIME SCHOOL YEARS OF EXPOSURE.													
Both sexes	7,649.50	429.48	784.11	819.78	714.59	687.92	675.19	645.20	606.30	541.65	429.78	715.25	600.25
Boys	3,865.35	218.83	394.36	421.92	352.87	344.17	334.99	317.62	259.81	261.76	214.11	411.05	333.87
Girls	3,784.15	210.65	389.75	397.87	361.73	343.74	340.20	327.58	346.49	279.88	215.67	304.20	266.38

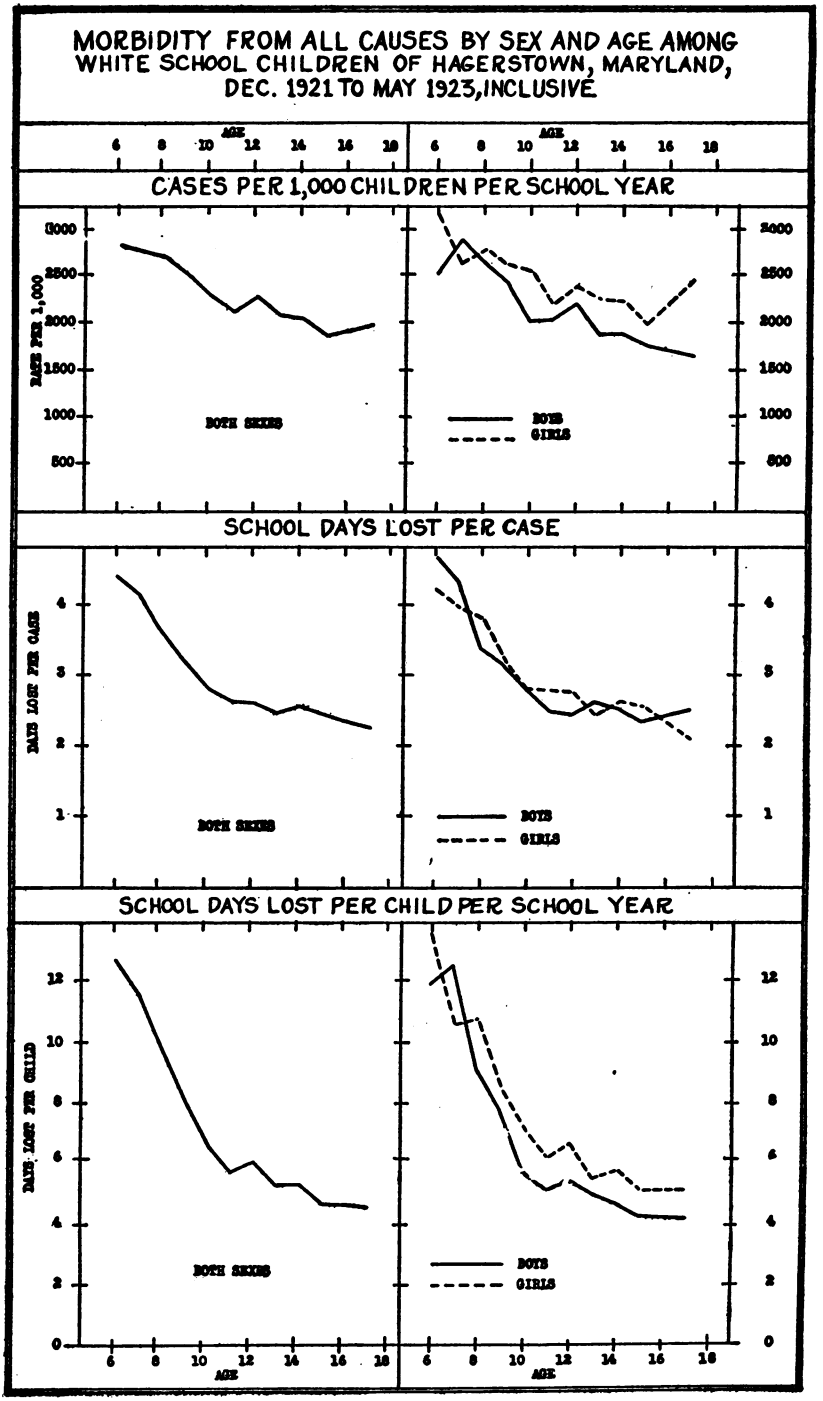

MORBIDITY FROM ALL CAUSES BY SEX AND AGE AMONG WHITE SCHOOL CHILDREN OF HAGERSTOWN, MARYLAND, DEC. 1921 TO MAY 1923, INCLUSIVE
AGE
6 8 10 12 14 16 18
CASES PER 1,000 CHILDREN PER SCHOOL YEAR
RATE PER 1,000
3000
2500
2000
1500
1000
500
BOTH SEXES
BOYS
GIRLS
SCHOOL DAYS LOST PER CASE
DAYS LOST PER CASE
4
3
2
1
BOTH SEXES
BOYS
GIRLS
SCHOOL DAYS LOST PER CHILD PER SCHOOL YEAR
DAYS LOST PER CHILD
12
10
8
6
4
2
0
BOTH SEXES
BOYS
GIRLS
AGE

FIG. 1.

It will be noted that there were 2,333 cases per 1,000 children per school year, or 2.3 cases per child, with a loss of 7.3 school days per child per year, or 4.1 per cent of the total possible days of attendance The boys had 2.2 cases per child against 2.5 for girls, and 6.9 days lost against 7.7 days for girls. The days lost per case, however, were practically the same for boys and girls. Figure 1 shows these rates graphically.

The scales in Figure 1 are arranged so that the rate for all ages combined is the same absolute height on each of the three graphs. The variation in the rates at different ages, therefore, can be judged accurately from the graph. The case rate shows the least variation and the days lost per child shows the greatest variation. In every instance there is a fairly marked decrease in the rates as age increases. In the rates for the days lost per child and the days lost per case the decrease is considerably more marked from 6 to 10 years than after those ages.

The graphs on the right in Figure 1 show the rates for boys and girls separately. The case rates and the days lost per person are consistently higher for girls than for boys, the only exception being the 7-year-old children. But the days lost per case do not show any consistent difference between the two sexes.

CAUSES OF ILLNESS.

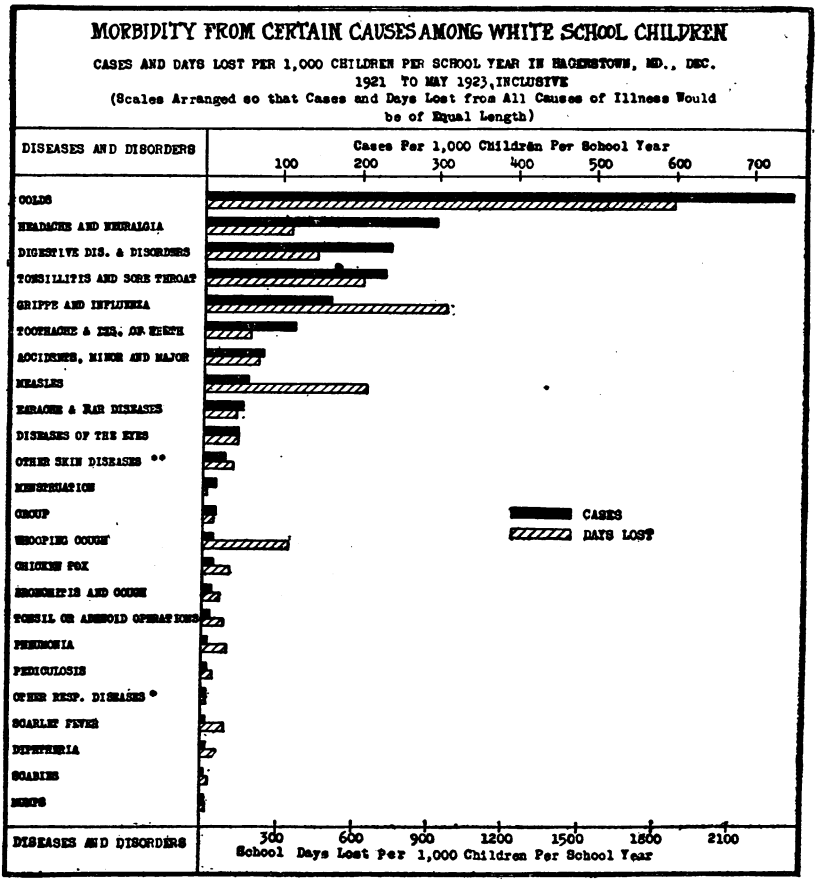
Owing to the more common occurrence of the communicable diseases during childhood and the frequently demonstrated possibility of controlling them, it is important to know what diseases are the chief causes of absence from school so that parents may be induced to give support and cooperation to the health and school authorities in enforcing measures to combat them. Table 3 shows both the case rates and the days lost per child by cause and sex.

TABLE 3.—*Morbidity among white school children of all ages, by sex and cause, in Hagerstown, Md., December, 1921, to May, 1923, inclusive.*

Diagnosis.	Cases per 1,000 children per school year of 180 school days.			School days lost per 1,000 children per school year of 180 school days.		
	Both sexes.	Boys.	Girls.	Both sexes.	Boys.	Girls.
All causes	2,333.1	2,193.6	2,475.6	7,295	6,879	7,720
Measles	52.8	51.2	54.4	643	629	658
Mumps	1.2	.8	1.6	6	2	11
Whooping cough	13.7	16.8	10.6	346	411	279
Chicken pox	13.3	16.3	10.3	113	139	87
Scarlet fever	4.1	3.4	4.8	96	94	97
Diphtheria	3.9	4.1	3.7	67	70	65
Croup	16.7	18.4	5.1	46	51	41
Colds	744.0	749.7	738.1	1,860	1,844	1,876
Grippe and influenza	160.3	140.0	181.0	960	840	1,081
Tonsilitis and sore throat	227.9	194.8	261.6	625	519	734
Bronchitis and cough	11.5	8.0	15.1	66	43	89
Pneumonia	5.4	6.0	4.8	105	109	102
Other respiratory diseases and disorders	5.0	3.1	6.9	24	19	29
Digestive diseases and disorders	235.8	226.4	245.5	445	387	505

TABLE 3.—*Morbidity among white school children of all ages, by sex and cause, in Hagerstown, Md., December, 1921, to May, 1923, inclusive*—Continued.

Diagnosis.	Cases per 1,000 children per school year of 180 school days.			School days lost per 1,000 children per school year of 180 school days.		
	Both sexes.	Boys.	Girls.	Both sexes.	Boys.	Girls.
Toothache and diseases of the teeth	115.8	114.3	117.3	178	168	187
Earache and ear diseases	49.8	43.7	56.0	127	110	145
Diseases and disorders of the eyes	42.6	39.8	45.5	130	129	132
Headache and neuralgia	294.9	252.0	338.8	345	309	381
Scabies	3.3	3.9	2.6	38	35	41
Pediculosis	5.1	2.3	7.9	50	16	84
Other skin diseases	27.2	30.8	23.5	117	141	92
Accidents, minor and major	74.8	86.4	62.9	213	263	163
Tonsil or adenoid operation	8.2	8.3	8.2	86	65	107
Menstruation			34.1			39
Other diseases and disorders	69.0	56.7	81.7	282	228	337
Unknown diagnosis	129.9	116.4	143.8	306	255	357
Number of days of exposure				1,376,910	695,763	681,147
Full time years of exposure				7,649.50	3,865.35	3,784.15



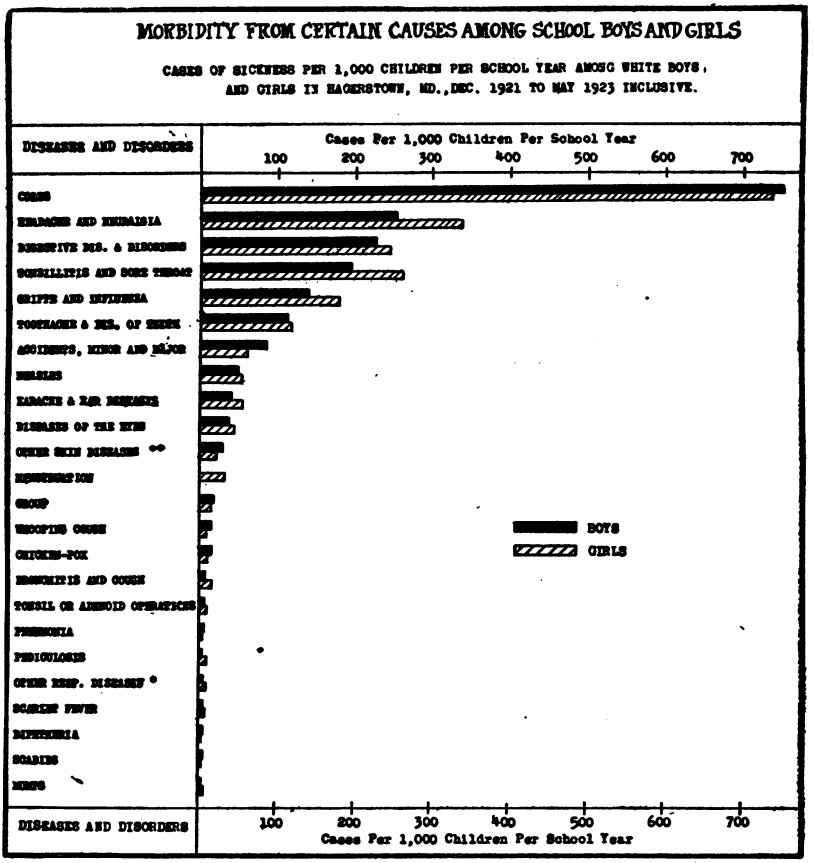
* Includes respiratory diseases other than colds, grippe and influenza, tonsillitis and sore throat, bronchitis and cough, and pneumonia.

** Includes skin diseases other than scabies and pediculosis.

FIG. 2.

In Figure 2 the case rates for both sexes have been arranged according to the size of the rate, and plotted. The days lost per 1,000 children per school year are also shown for each disease.

The scales in this figure are so arranged that the bars for the case rate and the days lost per child for all causes combined would be of equal length, if shown on the graph, and, therefore, the absolute length of the two bars for any disease are comparable as a measure



* Includes respiratory diseases other than colds, grippe and influenza, tonsillitis and sore throat, bronchitis and cough, and pneumonia.

** Includes skin diseases other than scabies and pediculosis.

FIG. 3.

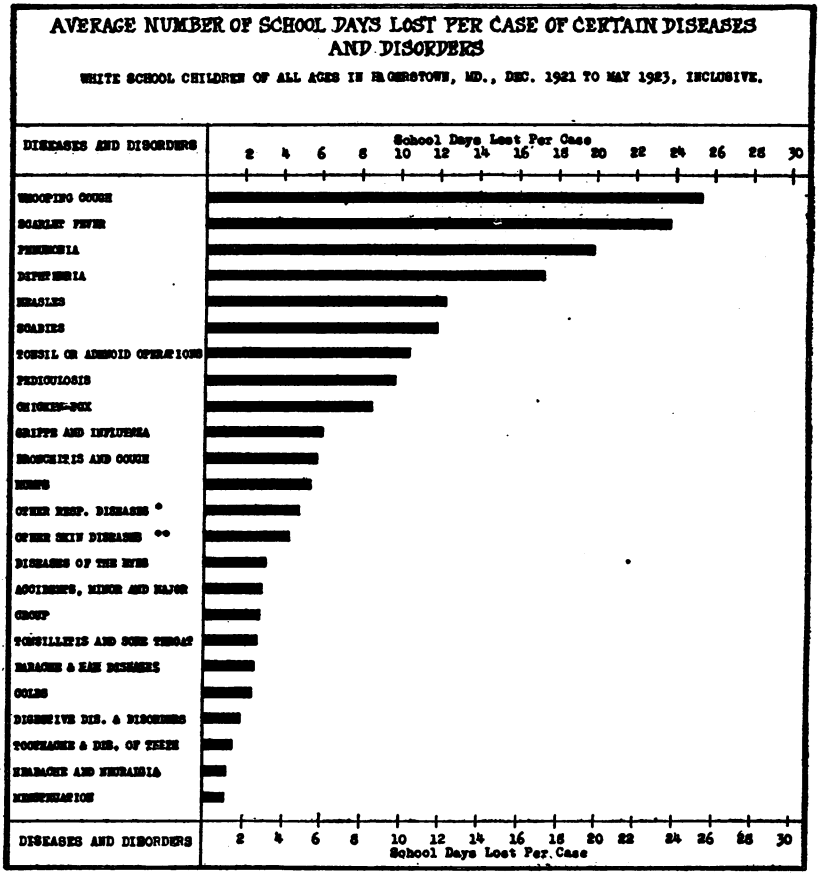
of the importance of the disease in terms of cases as compared with the days lost per child.

In point of frequency of cases as well as the days lost, common colds head the list; headaches come second and the digestive disorders are third so far as cases are concerned.

On the other hand, with regard to the number of days lost, "grippe" and influenza, tonsillitis, and sore throat, and measles each cause

considerably more absence than either headache or digestive disorders.

Case rates and days lost for each sex.—It will be remembered that for all causes combined both the case rates and the days lost per child for girls were quite consistently greater than for boys. In Figure 3 are shown the case rates for boys and girls by diseases. While these rates do not take into account differences in age distribution, it will be seen in Table 1 that the age distributions of the two sexes



* Includes respiratory diseases other than colds, grippe and influenza, tonsillitis and sore throat, bronchitis and cough, and pneumonia.

** Includes skin diseases other than scabies and pediculosis.

FIG. 4.

are so similar that the unadjusted rates for the boys and girls are comparable.

The case rates for a majority of the diseases considered are slightly higher for girls than for boys, although this is not true for colds, accidents, miscellaneous skin diseases, croup, whooping cough, chicken pox, pneumonia, diphtheria, and scabies. Whether or not

these differences between the sexes for different diseases are significant is best determined by an analysis according to age. In order to have a statistically satisfactory number of cases in certain age groups, this analysis is reserved until the third year's records, which are now being collected, are added to the data presented in this article.

Days lost per case.—On reference to Figure 1 it will be seen that there is no consistent difference between the sexes in the days lost per case because of illness from all causes. However, the days lost per case decreased considerably with age, particularly up to 10 or 11 years. Table 4 shows for each disease considered the days lost per case for all ages and in two age groups, viz, 10 years and under and 11 years and over. Figure 4 shows graphically for all ages the days lost per case. Whooping cough stands at the head of the list with 25.2 days' absence for each case of the disease. The averages for scarlet fever, pneumonia, and diphtheria are all above 15 days per case. Measles is next with an average of 12.2 days per case.

TABLE 4.—*Average number of days lost from school per case of certain diseases—white school children in Hagerstown, Md., December, 1921, to May, 1923, inclusive.*

Diagnosis.	Both sexes.			Boys.			Girls.		
	All ages.	5–10 years.	11 years and over.	All ages.	5–10 years.	11 years and over.	All ages.	5–10 years.	11 years and over.
	SCHOOL DAYS LOST PER CASE.								
All causes	3.1	3.6	2.5	3.1	3.7	2.5	3.1	3.6	2.5
Measles	12.2	12.0	13.5	12.3	11.9	14.2	12.1	12.1	12.7
Mumps	5.4	5.0	7.0	3.0	4.0	1.0	6.7	5.4	13.0
Whooping cough	25.2	25.7	17.8	24.5	24.8	19.3	26.4	27.2	16.3
Chicken pox	8.5	8.4	7.0	8.5	8.5	7.7	8.5	8.3	6.0
Scarlet fever	23.6	24.3	23.0	28.1	29.7	9.0	20.4	19.3	26.5
Diphtheria	17.2	15.6	19.4	16.9	15.8	17.6	17.5	15.5	32.0
Croup	2.8	2.8	2.1	2.8	2.9	1.6	2.7	2.7	3.0
Colds	2.5	2.7	2.2	2.5	2.7	2.2	2.5	2.7	2.2
Grippe and influenza	6.0	6.5	5.5	6.0	6.6	5.4	6.0	6.4	5.5
Tonsillitis and sore throat	2.7	2.9	2.7	2.7	2.8	2.6	2.7	2.9	2.7
Bronchitis and cough	5.7	5.2	6.5	5.3	4.1	9.1	5.9	6.0	5.6
Pneumonia	19.7	19.7	22.3	18.3	19.1	16.3	21.4	20.4	30.3
Other respiratory diseases and disorders	4.8	6.7	3.3	6.2	10.4	4.3	4.2	5.0	2.8
Digestive diseases and disorders	1.9	2.0	1.8	1.7	1.8	1.6	2.1	2.1	2.0
Toothache and diseases of the teeth	1.5	1.6	1.5	1.5	1.5	1.5	1.6	1.6	1.6
Earache and ear diseases	2.6	2.5	2.8	2.5	2.5	2.5	1.6	2.5	3.0
Diseases and disorders of the eyes	3.1	3.3	2.8	3.2	3.4	3.2	2.9	3.2	2.3
Headache and neuralgia	1.2	1.2	1.1	1.2	1.3	1.1	1.1	1.2	1.1
Scabies	11.8	13.1	11.5	9.1	11.5	1.5	15.7	15.4	21.5
Pediculosis	9.7	8.4	11.8	7.1	7.1		10.5	9.0	11.8
Other skin diseases	4.3	4.5	3.9	4.6	4.7	4.1	3.9	4.2	3.6
Accidents, minor and major	2.9	2.8	2.8	3.0	2.8	3.1	2.6	2.7	2.5
Tonsil or adenoid operations	10.4	10.1	10.7	7.9	8.3	5.6	13.1	12.4	15.0
Menstruation							1.1		1.1
Other diseases and disorders	4.1	3.9	4.0	4.0	3.8	4.5	4.1	4.0	3.7
Unknown diagnosis	2.4	2.4	2.3	2.2	2.1	2.3	2.5	2.8	2.3

TABLE 4.—*Average number of days lost from school per case of certain diseases—white school children in Hagerstown, Md., December, 1921, to May, 1923, inclusive*—Continued.

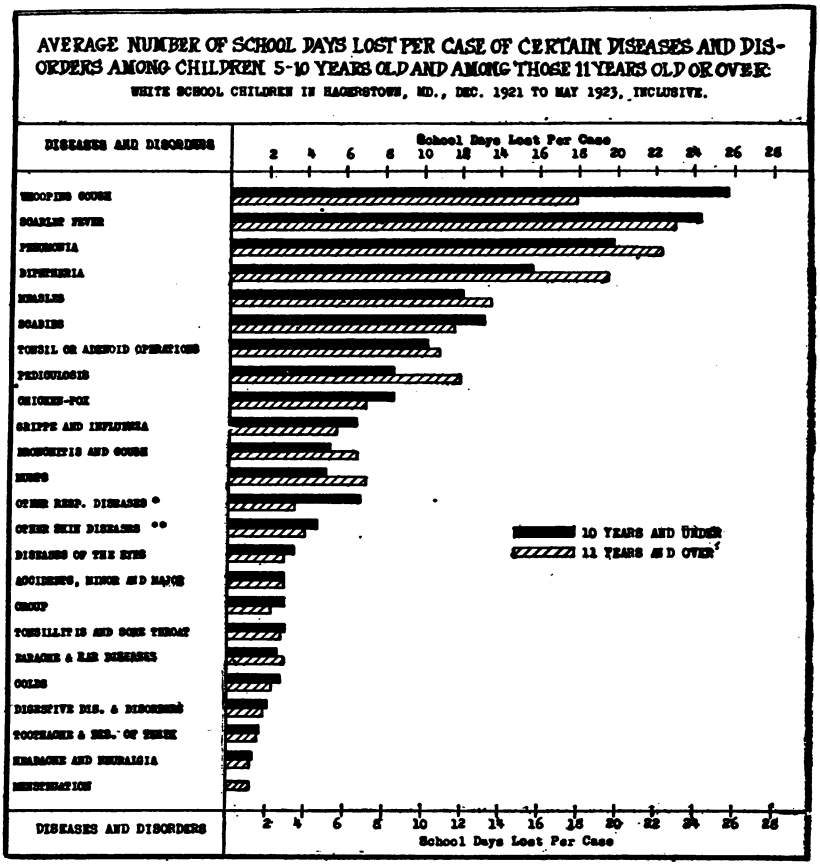
Diagnosis.	Both sexes.			Boys.			Girls.		
	All ages.	5–10 years.	11 years and over.	All ages.	5–10 years.	11 years and over.	All ages.	5–10 years.	11 years and over.
	NUMBER OF CASES OF SICKNESS.								
All causes	17,847	9,029	7,563	8,479	4,386	3,442	9,368	4,643	4,121
Measles	404	366	26	198	177	14	206	189	12
Mumps	9	7	2	3	2	1	6	5	1
Whooping cough	105	96	6	65	59	3	40	37	3
Chicken pox	102	90	5	63	55	3	39	35	2
Scarlet fever	31	25	5	13	12	1	18	13	4
Diphtheria	30	20	8	16	8	7	14	12	1
Croup	128	119	8	71	65	5	57	54	3
Colds	5,691	3,099	2,221	2,898	1,521	1,175	2,793	1,578	1,046
Grippe and influenza	1,226	507	622	541	238	255	685	269	367
Tonsillitis and sore throat	1,743	817	805	753	378	310	990	439	495
Bronchitis and cough	88	52	27	31	22	7	57	30	20
Pneumonia	41	30	7	23	16	4	18	14	3
Other respiratory diseases and disorders	38	13	22	12	4	7	26	9	15
Digestive diseases and disorders	1,804	879	807	875	438	386	929	441	421
Toothache and diseases of the teeth	886	409	401	442	190	189	444	210	212
Earache and ear diseases	381	269	87	169	112	40	212	157	47
Diseases and disorders of the eyes	326	158	144	154	70	72	172	88	72
Headache and neuralgia	2,256	904	1,174	974	406	491	1,282	498	683
Scabies	25	18	4	15	11	2	10	7	2
Pediculosis	39	30	8	9	9		30	21	8
Other skin diseases	208	104	93	119	54	55	89	50	38
Accidents, minor and major	572	238	277	334	145	154	238	93	123
Tonsil or adenoid operations	63	49	11	32	27	5	31	22	6
Menstruation							129		124
Other diseases and disorders	528	254	231	219	116	88	309	138	143
Unknown diagnosis	994	475	439	450	241	169	544	234	270

It must be borne in mind, in considering the number of days lost per case for each disease, that the basis is the number of school days lost, and that an absence of 20 days means a total duration of at least four weeks. An absence of five days may mean just five days of illness, or it may mean as much as nine days if the onset of the case occurs on Saturday and the last day of illness on the second Sunday following. The intervention of holidays may also shorten the calculated duration of absence due to a case of illness. Cases developing during the Christmas holidays and with a total duration of two weeks extending a few days into the school days of January, therefore, are a source of error. The school days lost per case is, therefore, an understatement of the average disabling illness resulting from an attack of a given disease. In this study all cases of illness were included regardless of duration. The minimum time lost counted as an absence was one-half day.[7]

As already noted, the days lost per case of sickness from all causes combined decreased considerably with age. In Figure 5 is shown the number of days lost per case for each disease in children 10 years of

[7] It frequently happens among school children, as well as among adults, that an illness does not cause continuous absence from school or work. In other words, a single case of illness may cause two or more absences with an interval between them during which the child attends school. For example, a child may be absent on account of a cold on Monday, be present on Tuesday and Wednesday, and again absent on account an exacerbation of the same cold on Thursday. An investigation of any large number of cases on this basis would be difficult and expensive. The data for this study do not differentiate exacerbations from new cases. Therefore, in making tabulations it seemed reasonable to assume that an absence on ac-

age and under and for those 11 years old and over. Of the 26 classifications shown in Table 4, the averages for 16 diseases are greater in the younger group; but for pneumonia, diphtheria, measles, tonsillectomy, pediculosis, bronchitis and cough, mumps, earache, and miscellaneous or other causes of sickness the average per case is larger



* Includes respiratory diseases other than colds, grippe and influenza, tonsillitis and sore throat, bronchitis and cough, and pneumonia.

** Includes skin diseases other than scabies and pediculosis.

FIG. 5.

in the older group. In the case of accidents the average is the same in the two groups. The number of cases of certain diseases was too small to be of much statistical value.

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count of illness from the same cause should not be counted as a new case unless there was an interval of eight calendar days or longer between the end of one absence and the beginning of the next. An interval of seven calendar days (one calendar week) or less is, of course, an arbitrary limit which may classify in some instances two new cases as a single case, and in other instances make two new cases of a single case with two absences, such as a case with a relapse. However, in the choice of tabulating every absence as a separate case and the assumption of at least a week's interval between cases of the same disease as constituting a new case, the latter seemed to be the better procedure.

In the case of headache, toothache, and a few other similar conditions, exceptions were made to this general rule because of the usually short duration of an attack, and each continuous absence was counted as a case regardless of the interval between absences due to these disorders.

For the school year 1922-23 both absences and cases were tabulated, and Appendix Tables 10 and 11 show the number of both absences and cases for each disease and for each age for all diseases combined.

TABLE 5.—*Case rates of sickness from certain causes by single years of age among white school children of both sexes in Hagerstown, Md., December, 1921, to May, 1923, inclusive.*

Diagnosis.	All ages.	Age nearest birthday.											
		6 and under.	7	8	9	10	11	12	13	14	15	16 and over.	Unknown age.
CASES PER 1,000 CHILDREN PER SCHOOL YEAR OF 180 SCHOOL DAYS.													
All causes	2,333	2,848	2,779	2,721	2,541	2,297	2,134	2,300	2,106	2,073	1,887	1,995	2,091
Measles	53	193	195	101	45	22	19	11	5	4		1	20
Whooping cough	14	58	41	27	14	10	1	3	2		2	1	5
Chicken pox	13	44	55	22	8	6	3	5					12
Scarlet fever	4	7	9	12	4	3	1	3		2		1	2
Diphtheria	4	7	10	6	4	1	1	6	2	4			3
Croup	17	40	46	45	24	17	6	5		2			2
All respiratory diseases and disorders	1,154	1,467	1,403	1,372	1,227	1,144	1,074	1,040	1,004	942	994	1,064	1,008
Colds	744	1,111	999	937	812	714	615	689	554	582	589	685	618
Grippe and influenza	160	140	133	151	139	145	151	138	198	146	191	210	162
Tonsillitis and sore throat	228	151	207	268	267	262	296	248	242	203	177	155	202
Other respiratory diseases and disorders	22	65	40	16	10	23	12	15	10	11	37	14	27
Digestive diseases and disorders	236	237	241	279	299	211	210	287	203	236	209	194	197
Toothache and diseases of the teeth	116	119	98	124	126	129	117	115	145	96	105	88	127
Earache and ear diseases	50	121	82	79	74	51	43	26	21	26	14	11	42
Diseases and disorders of the eyes	43	28	46	57	43	47	27	46	54	50	37	28	40
Headache and neuralgia	295	154	204	261	327	334	333	398	365	325	270	250	297
Skin diseases and disorders	36	54	37	54	52	28	30	37	30	35	5	31	25
Accidents, minor and major	75	42	62	74	87	70	87	99	73	79	51	63	95
Tonsil or adenoid operations	8	16	22	11	11	12	4	3	5	2		3	5
Menstruation	17							5	15	30	49	105	8
Other and unknown diseases and disorders	200	261	228	195	195	212	176	211	183	242	151	154	205
RATIO OF THE RATE IN EACH AGE TO THE RATE FOR ALL AGES (ALL AGES=100).													
All causes	100	122	119	117	109	98	91	99	90	89	81	86	90
Measles	100	364	368	191	85	42	36	21	9	8		2	38
Whooping cough	100	414	293	193	100	71	7	21	14		14	7	36
Chicken pox	100	338	423	169	62	46	23	38					92
Scarlet fever	100	175	225	300	100	75	25	75		50		25	50
Diphtheria	100	175	250	150	100	25	25	150	50	100			75
Croup	100	235	271	265	141	100	35	29		12			12
All respiratory disease and disorders	100	127	122	119	106	99	93	90	87	82	86	92	87
Colds	100	149	134	126	109	96	83	86	74	78	79	92	83
Grippe and influenza	100	88	99	94	87	91	94	86	124	91	119	131	101
Tonsillitis and sore throat	100	66	91	118	117	115	130	109	106	89	78	68	89

TABLE 5.—*Case rates of sickness from certain causes by single years of age among white school children of both sexes in Hagerstown, Md., December, 1921, to May, 1923, inclusive*—Continued.

Diagnosis.	All ages.	Age nearest birthday.											
		6 and under.	7	8	9	10	11	12	13	14	15	16 and over.	Unknown age.
RATIO OF THE RATE IN EACH AGE TO THE RATE FOR ALL AGES (ALL AGES=100)—Continued.													
Other respiratory diseases and disorders	100	295	182	73	45	105	55	68	45	50	168	64	123
Digestive diseases and disorders	100	100	102	118	127	89	89	122	86	100	89	82	83
Toothache and diseases of the teeth	100	103	84	107	109	111	101	99	125	83	91	76	109
Earache and ear diseases	100	242	164	158	148	102	86	52	42	52	28	22	84
Diseases and disorders of the eyes	100	65	107	133	100	109	63	107	126	116	86	65	98
Headache and neuralgia	100	52	69	88	111	113	113	135	124	110	92	85	101
Skin diseases and disorders	100	150	103	150	144	78	83	103	83	97	14	86	69
Accidents, minor and major	100	56	83	99	116	93	116	132	97	105	68	84	127
Tonsil or adenoid operations	100	200	275	138	138	150	50	38	63	25	----	38	63
Menstruation	100	----	----	----	----	----	----	29	88	176	288	618	47
Other and unknown diseases and disorders	100	131	114	98	98	106	88	106	92	121	76	77	103
NUMBER OF CASES OF SICKNESS.													
All causes	17,847	1,223	2,179	2,231	1,816	1,580	1,441	1,484	1,277	1,123	811	1,427	1,255
Measles	404	83	153	83	32	15	13	7	3	2	----	1	12
Whooping cough	105	25	32	22	10	7	1	2	1	----	1	1	3
Chicken pox	102	19	43	18	6	4	2	3	----	----	----	----	7
Scarlet fever	31	3	7	10	3	2	1	2	----	1	----	1	1
Diphtheria	30	3	8	5	3	1	1	4	1	2	----	----	2
Croup	128	17	36	37	17	12	4	3	----	1	----	----	1
All respiratory diseases and disorders	8,827	630	1,100	1,125	877	787	725	671	609	510	427	761	605
Colds	5,691	477	783	768	580	491	415	412	336	315	253	490	371
Grippe and influenza	1,226	60	124	124	99	100	102	89	120	79	82	150	97
Tonsilitis and sore throat	1,743	65	162	220	191	180	200	160	147	110	76	111	121
Other respiratory diseases and disorders	167	28	31	13	7	16	8	10	6	6	16	10	16
Digestive diseases and disorders	1,804	102	189	229	214	145	142	185	123	128	90	139	118
Tootache and diseases of the teeth	886	51	77	102	90	89	79	74	88	52	45	63	76
Earache and ear diseases	381	52	64	65	53	35	29	17	13	14	6	8	25
Diseases and disorders of the eyes	326	12	36	47	31	32	18	30	33	27	16	20	24
Headache and neuralgia	2,256	66	160	214	234	230	225	257	221	176	116	179	178
Skin diseases and disorders	272	23	29	44	37	19	20	24	18	19	2	22	15
Accidents, minor and major	572	18	49	61	62	48	59	64	44	43	22	45	57
Tonsil or adenoid operations	63	7	17	9	8	8	3	2	3	1	----	2	3
Menstruation	129	----	----	----	----	----	----	3	9	16	21	75	5
Other and unknown diseases and disorders	1,531	112	179	160	139	146	119	136	111	131	65	110	123

Number of days of exposure	1,376,910	77,307	141,139	147,561	128,627	123,825	121,535	116,136	109,134	97,497	77,359	128,745	108,045
Number of full-time years	7,649.50	429.48	784.11	819.78	714.59	687.92	675.19	645.20	606.30	541.65	429.78	715.25	600.25

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TABLE 6.—*Days lost from certain causes of sickness by single years of age among white school children of both sexes in Hagerstown, Md., December, 1921, to May, 1923, inclusive.*

Diagnosis.	All ages.	Age nearest birthday.											
		6 and under.	7	8	9	10	11	12	13	14	15	16 and over.	Unknown age.
SCHOOL DAYS LOST PER 1,000 CHILDREN PER SCHOOL YEAR OF 180 SCHOOL DAYS.													
All causes	7,295	12,673	11,600	9,836	8,121	6,439	5,656	6,042	5,301	5,345	4,655	4,576	6,441
Measles	643	2,475	2,194	1,214	577	301	247	136	30	100	----------	34	290
Whooping cough	346	1,614	1,078	679	339	193	28	64	20	----------	49	20	113
Chicken pox	113	312	465	199	90	47	28	25	----------	----------	----------	----------	125
Scarlet fever	96	114	187	390	81	48	37	53	----------	65	----------	29	17
Diphtheria	67	93	129	93	109	25	27	116	48	61	----------	----------	80
Croup	46	123	132	110	62	62	13	9	----------	4	----------	----------	5
All respiratory diseases and disorders	3,640	4,959	4,817	4,588	4,040	3,514	3,164	3,154	2,953	2,778	2,942	2,952	3,377
Colds	1,860	2,885	2,749	2,666	2,297	1,736	1,452	1,563	1,258	1,267	1,151	1,353	1,515
Grippe and influenza	960	1,027	1,048	943	949	819	825	830	983	805	1,060	1,138	1,105
Other respiratory diseases and disorders	195	644	318	196	104	240	80	65	48	191	221	113	233
Tonsillitis and sore throat	625	404	673	784	691	720	807	687	665	514	511	348	524
Digestive diseases and disorders	445	551	439	576	586	372	415	526	332	538	329	273	384
Toothache and diseases of the teeth	178	215	143	182	204	222	167	148	225	172	193	127	160
Earache and ear diseases	127	382	230	196	153	90	133	50	74	83	26	28	94
Diseases and disorders of the eyes	130	75	203	188	133	117	82	160	200	95	77	45	133
Headache and neuralgia	345	182	246	333	425	385	408	444	383	326	302	262	390
Skin diseases and disorders	205	271	275	278	358	195	124	226	204	145	16	89	197
Accidents, minor and major	213	115	209	169	265	176	183	276	230	251	243	137	317
Tonsil or adenoid operations	86	228	241	78	112	96	105	36	16	6	----------	15	70
Menstruation	19	----------	----------	----------	----------	----------	----------	5	20	34	57	115	12
Other and unknown diseases and disorders	594	964	613	562	588	596	495	615	565	689	420	449	678

TABLE 6.—*Days lost from certain causes of sickness by single years of age among white school children of both sexes in Hagerstown, Md., December, 1921, to May, 1923, inclusive*—Continued.

Diagnosis.	All ages.	Age nearest birthday.											
		6 and under.	7	8	9	10	11	12	13	14	15	16 and over.	Unknown age.
RATIO OF THE RATE IN EACH AGE TO THE RATE FOR ALL AGES (ALL AGES=100).													
All causes	100	174	159	135	111	88	78	83	73	73	64	63	88
Measles	100	385	341	189	90	47	38	21	5	16	----	5	45
Whooping cough	100	466	312	196	98	56	8	18	6	----	14	6	33
Chicken pox	100	276	412	176	80	42	25	22	----	----	----	----	111
Scarlet fever	100	119	195	406	84	50	39	55	----	68	----	30	18
Diphtheria	100	139	193	139	163	37	40	173	72	91	----	----	119
Croup	100	267	287	239	135	135	28	20	----	9	----	----	11
All respiratory diseases and disorders	100	136	132	126	111	97	87	87	81	76	81	81	93
Colds	100	155	148	143	123	93	78	84	68	68	62	73	81
Grippe and influenza	100	107	109	98	99	85	86	87	102	84	110	119	115
Tonsillitis and sore throat	100	65	108	125	111	115	129	110	106	82	82	56	84
Other respiratory diseases and disorders	100	330	178	101	53	123	41	33	25	98	113	58	119
Digestive diseases and disorders	100	124	99	129	132	84	93	118	75	121	74	61	86
Toothache and diseases of the teeth	100	121	80	102	115	125	94	83	126	97	108	71	90
Earache and ear diseases	100	301	181	154	120	71	105	39	58	65	20	22	74
Diseases and disorders of the eyes	100	58	156	145	102	90	63	123	154	73	59	35	102
Headache and neuralgia	100	53	71	97	123	112	118	129	111	94	88	76	113
Skin diseases and disorders	100	132	134	136	175	95	60	110	100	71	8	43	96
Accidents, minor and major	100	54	98	79	124	83	86	130	108	118	114	64	149
Tonsil or adenoid operations	100	265	280	91	130	112	122	42	19	7	----	17	81
Menstruation	100	----	----	----	----	----	----	26	105	179	300	605	63
Other and unknown diseases and disorders	100	162	103	95	99	100	83	104	95	116	71	76	114
NUMBER OF DAYS LOST FROM SICKNESS.													
All causes	55,800.0	5,443.0	9,095.5	8,063.0	5,803.0	4,429.5	3,819.0	3,898.0	3,214.0	2,895.0	2,000.5	3,273.0	3,866.5
Measles	4,922.0	1,063.0	1,720.0	995.0	412.0	207.0	167.0	88.0	18.0	54.0	----	24.0	174.0
Whooping cough	2,645.0	693.0	845.0	557.0	242.0	133.0	19.0	41.0	12.0	----	21.0	14.0	68.0
Chicken pox	868.0	134.0	365.0	163.0	64.0	32.0	19.0	16.0	----	----	----	----	75.0
Scarlet fever	732.0	49.0	147.0	320.0	58.0	33.0	25.0	34.0	----	35.0	----	21.0	10.0
Diphtheria	515.0	40.0	101.0	76.0	78.0	17.0	18.0	75.0	29.0	33.0	----	----	48.0
Croup	354.0	53.0	103.5	90.5	44.5	42.5	9.0	6.0	----	2.0	----	----	3.0
All respiratory diseases and disorders	27,842.5	2,130.0	3,777.0	3,761.5	2,887.0	2,417.5	2,136.5	2,035.0	1,790.5	1,504.5	1,264.5	2,111.5	2,027.0
Colds	14,225.0	1,239.0	2,155.5	2,185.5	1,641.5	1,194.0	980.5	1,008.5	762.5	686.5	494.5	967.5	909.5
Grippe and influenza	7,340.0	441.0	821.5	773.0	678.0	563.5	557.0	541.5	596.0	436.0	455.5	814.0	663.0
Tonsillitis and sore throat	4,784.5	173.5	527.5	642.5	493.5	495.0	545.0	443.0	403.0	278.5	219.5	249.0	314.5

Other respiratory diseases and disorders	1,493.0	276.5	272.5	160.5	74.0	165.0	54.0	42.0	29.0	103.5	95.0	81.0	140.0
Digestive diseases and disorders	3,407.0	236.5	44.0	472.0	419.0	256.0	280.0	339.5	201.5	291.5	141.5	195.0	230.5
Toothache and diseases of the teeth	1,360.0	92.5	112.0	149.5	145.5	153.0	112.5	95.5	136.5	93.0	83.0	91.0	96.0
Earache and ear diseases	975.0	164.0	180.5	160.5	109.0	62.0	89.5	32.0	45.0	45.0	11.0	20.0	56.5
Diseases and disorders of the eyes	998.0	32.0	159.0	154.0	95.0	80.5	55.5	103.5	121.5	51.5	33.0	32.5	80.0
Headache and neuralgia	2,635.5	78.0	193.0	273.0	304.0	265.0	275.5	286.5	232.5	176.5	130.0	187.5	234.0
Skin diseases and disorders	1,569.5	116.5	215.5	228.0	255.5	134.0	83.5	145.5	123.5	78.5	7.0	64.0	118.0
Accidents, minor and major	1,632.0	49.5	163.5	138.5	189.5	121.0	123.5	178.0	139.5	136.0	104.5	98.0	190.5
Tonsil or adenoid operations	657.0	98.0	189.0	64.0	80.0	66.0	71.0	23.0	10.0	3.0	----------	11.0	42.0
Menstruation	147.0	----------	----------	----------	----------	----------	----------	3.0	12.0	18.5	24.5	82.0	7.0
Other and unknown diseases and disorders	4,540.5	414.0	480.5	460.5	420.0	410.0	334.5	396.5	342.5	373.0	180.5	321.5	407.0

EXPOSURE.

Number of days' exposure	1,376,910	77,307	141,139	147,561	128,627	123,825	121,535	116,136	109,134	97,497	77,359	128,745	108,045
Number of full-time years	7,649.50	429.48	784.11	819.78	714.59	687.92	675.19	645.20	606.30	541.65	429.78	715.25	600.25

AGE INCIDENCE OF CERTAIN DISEASES.

The age of greatest incidence for the different diseases is of potential significance with regard to school progress. It is of interest, therefore, to inquire at what school ages the different diseases have the greatest incidence. In Tables 5 and 6 are shown the frequency rates and the days lost per child for each age for certain diseases.

The actual rates for the different diseases for all ages combined are shown graphically in Figure 2. These rates vary so greatly that it is practically impossible to plot the age curves on a single scale. Therefore, for the purpose of showing the relative age incidence, the rates were reduced to an index basis by dividing the rate at each age by the rate for all ages combined. These indices are given in the second sections of Tables 5 and 6 and indices of the case rates plotted in Figure 6.

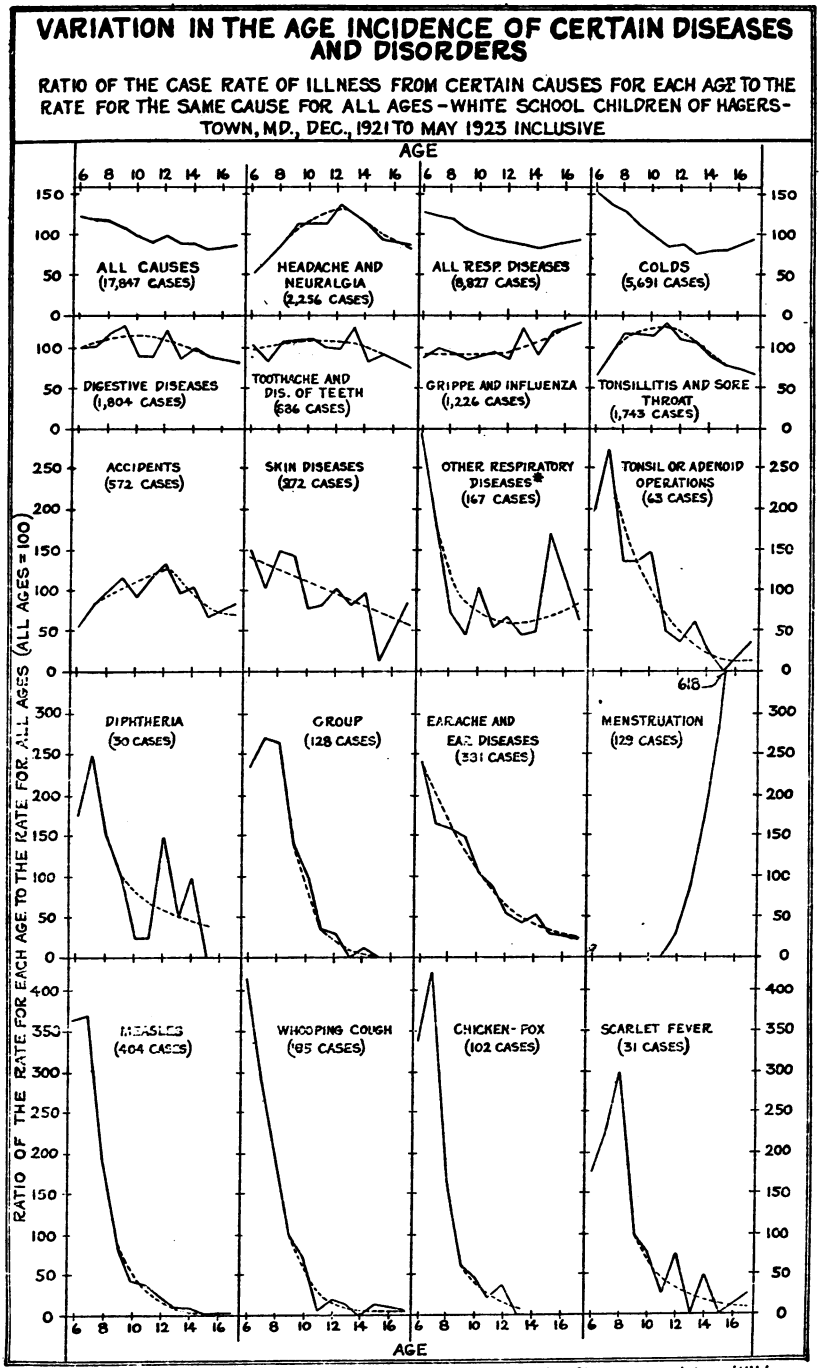
The height of the curves of the indices in Figure 6 do not represent the size of the rates; but the extent of the deviation of the curve from the base (100) does represent the extent of the variation in the rates at different ages from the rate for all ages combined. If there were no variations whatever, the curve would be a straight line at 100. The curves are representative, therefore, of the relative age incidence of the diseases.

In some instances the curves are irregular, but in most cases they do indicate certain general tendencies. Dotted lines have been drawn in Figure 6 to indicate in a very general way the tendencies apparently shown by the actual rates.

When the respiratory affections are considered as a whole, the incidence rate falls regularly from 6 to 14 years of age, but rises somewhat at 15 and older ages. The respiratory affections constitute about half of the total cases of illness from all causes, and the curve for all causes is therefore very similar to the one for respiratory affections. Colds, which comprise the greater part of the respiratory disorders, show, with some slight exceptions, the same general tendencies as are shown by all respiratory diseases, but the decline with age is somewhat more rapid.

The rates for "grippe" and influenza form almost a straight line to 12 years of age, but show considerable rise after that age. It is difficult to judge by the relatively limited influenza curve for the Hagerstown school children whether it is similar to the characteristic age curve of influenza for the epidemic of 1918. That there is a difference from the 1918 morbidity curve seems to be indicated, inasmuch as the 1918 curve, for the ages 5 to 19 years (5-year age groups) shows a downward trend for both boys and girls,[8] whereas

[8] Statistics of influenza morbidity, with special reference to certain factors in case incidence and case fatality. By W. H. Frost. Public Health Reports, vol. 35, No. 11, March 12, 1920, pp 584-597. (Reprint No. 586.)



* Includes respiratory diseases other than colds, grippe and influenza, and tonsillitis and sore throat.

FIG. 6.

the curve for influenza among the school children at Hagerstown for the period 1922–23 shows an upward trend. During this period practically all the influenza occurred in two epidemics which attained their peaks in March, 1922, and February, 1923, respectively.

The age curve for tonsillitis and sore throat is very different from the curves for the other respiratory diseases. It rises from 6 years of age to a maximum at 11 years, and declines to a point about equal to the 6-year rate at 16 years of age.

The curve for headache shows a rising rate up to 12 years and then declines. The rates for the digestive diseases and toothache show some tendency to rise in the middle years of school life and then decline after approximately 10 years of age.

The accident cases are made up chiefly of minor injuries of the hands and feet such as commonly happen to school children at play. Few serious accidents were reported. The age curve for these minor injuries rises in the middle years of school life, reaching a maximum at about 12 years, and then declines.

None of the diseases mentioned above shows anything like as much variation as do the children's diseases (fig. 6). Measles, whooping cough, chicken pox, scarlet fever, diphtheria, and croup all have very much higher incidence at the younger than at the older ages considered in this study. The incidence of whooping cough is greatest at 6 years; of measles, chicken pox, and diphtheria is somewhat greater at 7 than at 6 years, but falls off rapidly after 7 years; croup is high at 6, 7, and 8 years and then rapidly declines. The incidence of scarlet fever seems to increase to a maximum at about 8 years and then markedly declines.

SEASONAL VARIATION IN THE INCIDENCE OF CERTAIN DISEASES.

In Table 7 are shown the frequency rates and the days lost per child by months for all causes and for certain diseases. These rates are reduced to the basis of a school year of 180 school days, the rate for any month representing the rate that would have resulted if absence had continued throughout the school year at the rate which occurred during the month. Inasmuch as the different months vary in length, the rates are reduced to this common basis in order to make the monthly rates comparable.

TABLE 7.—*Seasonal variation in the morbidity from certain diseases and disorders: Case incidence and days lost by months among white school children in Hagerstown, Md., December, 1921, to May, 1923, inclusive.*

Diagnosis.	1921	1922					1922				1923				
	December.	January.	February.	March.	April.	May.[1]	September.	October.	November.	December.	January.	February.	March.	April.	May.[1]
CASES OF SICKNESS PER 1,000 CHILDREN PER SCHOOL YEAR OF 180 SCHOOL DAYS.															
All causes	1,892	2,187	2,333	3,024	2,065	1,149	1,216	1,839	2,026	2,385	3,364	4,504	2,843	2,432	1,477
All respiratory diseases and disorders	1,026	1,361	1,280	1,821	847	312	281	629	710	971	1,810	3,200	1,627	849	513
All other causes	866	826	1,052	1,203	1,218	837	935	1,210	1,316	1,415	1,554	1,303	1,216	1,583	964
Measles	12	2	37	66	86	162	2	-------	2	2	95	101	64	125	26
Whooping cough	6	23	17	54	89	58	2	-------	-------	-------	-------	-------	2	-------	-------
Chicken pox	17	12	12	19	6	2	-------	4	18	24	21	19	10	13	20
Scarlet fever	6	2	2	-------	-------	2	-------	11	9	14	6	-------	2	5	1
Diphtheria	6	-------	-------	6	-------	-------	-------	9	19	9	6	-------	-------	2	-------
Croup	23	30	20	15	17	2	6	6	11	31	31	30	15	11	12
Colds	686	943	925	1,151	537	211	159	364	425	639	1,157	1,893	1,145	542	366
Grippe and influenza	17	54	74	342	66	11	11	22	32	54	273	995	244	62	12
Tonsillitis and sore throat	302	303	267	291	221	85	100	229	237	263	347	267	216	227	129
Other respiratory diseases and disorders	20	61	15	36	22	4	11	13	16	14	32	44	22	18	7
Digestive diseases and disorders	195	208	248	225	271	175	213	265	295	350	315	165	232	243	165
Headache and neuralgia	218	159	275	300	282	175	230	279	316	338	415	342	315	459	245
All other diagnoses	384	390	442	518	468	260	483	636	647	646	665	646	577	726	495
DAYS LOST PER 1,000 CHILDREN PER SCHOOL YEAR OF 180 SCHOOL DAYS															
All causes	4,393	6,983	6,767	11,130	7,675	6,900	2,376	4,223	5,185	6,650	9,520	18,019	9,570	6,512	3,438
All respiratory diseases and disorders	2,379	4,301	3,553	5,918	2,566	828	584	1,280	1,776	2,722	5,166	13,261	6,172	2,105	1,255
All other causes	2,014	2,680	3,213	5,212	5,109	6,072	1,792	2,943	3,409	3,928	4,354	4,758	3,398	4,407	2,183
Measles	38	19	238	1,046	742	2,351	15	-------	9	9	730	1,615	688	1,638	330
Whooping Cough	26	329	444	1,181	1,899	2,146	9	35	35	35	-------	-------	20	-------	-------
Chicken pox	119	119	66	184	36	15	-------	18	139	146	233	189	101	93	168
Scarlet fever	35	47	42	13	-------	9	-------	115	306	273	243	81	96	102	14
Diphtheria	70	19	-------	101	42	-------	-------	94	251	259	100	71	-------	27	-------
Croup	68	64	49	52	37	2	9	9	42	86	61	135	51	23	21
Colds	1,386	2,673	2,092	3,128	1,312	494	284	634	915	1,502	2,743	5,577	3,114	1,150	776
Grippe and influenza	55	205	314	1,691	537	53	43	74	144	277	1,249	6,423	1,980	340	92
Tonsillitis and sore throat	859	873	758	835	526	247	240	512	601	834	992	779	651	558	335
Other respiratory diseases and disorders	78	550	389	265	191	34	18	60	116	108	182	482	427	57	52
Digestive diseases and disorders	373	425	459	415	462	366	309	487	618	798	630	288	422	426	282
Headache and neuralgia	251	211	370	444	317	215	265	310	339	422	436	375	374	511	282
All other diagnoses	1,033	1,450	1,545	1,775	1,575	968	1,185	1,874	1,670	1,901	1,921	2,003	1,645	1,589	1,085

[1] Including a few days of June.

TABLE 7.—*Seasonal variation in the morbidity from certain diseases and disorders: Case incidence and days lost by months among white school children in Hagerstown, Md., December, 1921, to May, 1923, inclusive*—Continued.

Diagnosis.	1921	1922					1922				1923				
	December.	January.	February.	March.	April.	May.[1]	September.	October.	November.	December.	January.	February.	March.	April.	May.[1]
NUMBER OF CASES OF SICKNESS.															
All causes	651	937	951	1,413	746	538	657	994	1,153	1,015	2,093	2,543	1,681	1,341	1,134
All respiratory diseases and disorders	353	583	522	851	306	146	152	340	404	413	1,126	1,807	962	468	394
All other causes	298	354	428	562	440	392	505	654	749	602	967	736	719	873	740
Measles	4	1	15	31	31	76	1		1	1	59	57	38	69	20
Whooping cough	2	10	7	25	32	27	1						1		
Chicken pox	6	5	5	9	2	1		2	10	10	13	11	6	7	15
Scarlet fever	2	1	1			1		6	5	6	4		1	3	1
Diphtheria	2			3				5	11	4	4			1	
Croup	8	13	8	7	6	1	3	3	6	13	19	17	9	6	9
Colds	236	404	377	538	194	99	86	197	242	272	720	1,069	677	299	281
Grippe and influenza	6	23	30	160	24	5	6	12	18	23	170	562	144	34	9
Tonsillitis and sore throat	104	130	109	136	80	40	54	124	135	112	216	151	128	125	99
Other respiratory diseases and disorders	7	26	6	17	8	2	6	7	9	6	20	25	13	10	5
Digestive diseases and disorders	67	89	101	105	98	82	115	143	168	149	196	93	137	134	127
Headache and neuralgia	75	68	112	140	102	82	124	151	180	144	238	193	186	253	188
All other diagnoses	132	167	180	242	169	122	261	344	368	275	414	365	341	400	380
EXPOSURE.															
Number of children	3,643	3,672	3,669	3,657	3,613	3,372	5,117	5,121	5,122	5,106	5,091	5,082	5,068	4,962	4,935
School days in month	17	21	20	23	18	25	19	19	20	15	22	20	21	20	28
Total possible days of attendance	61,931	77,112	73,380	84,111	65,034	84,300	97,223	97,299	102,440	76,590	112,002	101,640	106,428	99,240	138,180
Full-time years of exposure	344.06	428.40	407.67	467.28	361.30	468.33	540.13	540.55	569.11	425.50	622.23	564.67	591.27	551.33	767.67

[1] Including a few days of June.

The number of days lost per child is based not on the days lost from cases arising in the given month but on the actual days lost from the given cause during the month regardless of the date of onset of the cases causing the absence. A close examination of the data indicates that the number of days lost from all causes combined and from certain causes, particularly colds and the respiratory affections, varies more than the case rates. This fact would indicate that colds were of a more severe type, as measured in duration per case, in

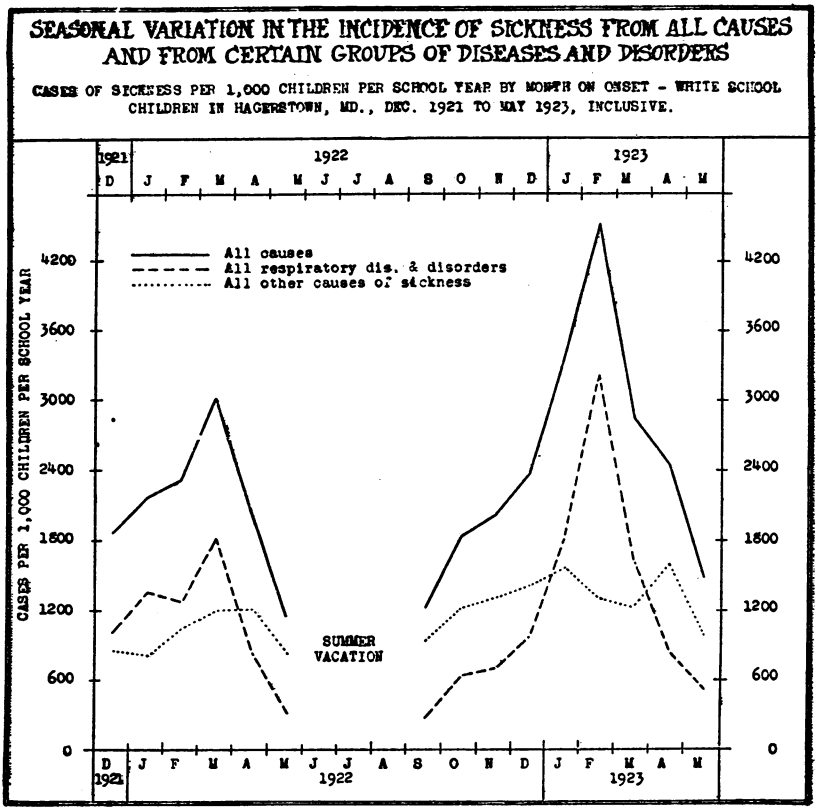


FIG. 7

some months than in others. A more detailed analysis of this phenomenon is reserved for a later report.

In Figure 7 are shown the case rates for all causes combined and for two large classes, viz, the respiratory diseases and all other causes. The seasonal variation in the nonrespiratory diseases is slight but that in the respiratory diseases is very marked. The peak is in March in 1922 and in February in 1923.

The rates for certain specific diseases are shown on a very much larger scale in Figure 8. Colds have a very definite peak at the times influenza was most prevalent—March, 1922, and February, 1923. There seems to be no very definite connection between the prevalence of tonsillitis and influenza.

During the spring of 1922 the frequency rates for measles and whooping cough were about equal, except in May. During the winter of 1922–23 only two cases of whooping cough were reported,

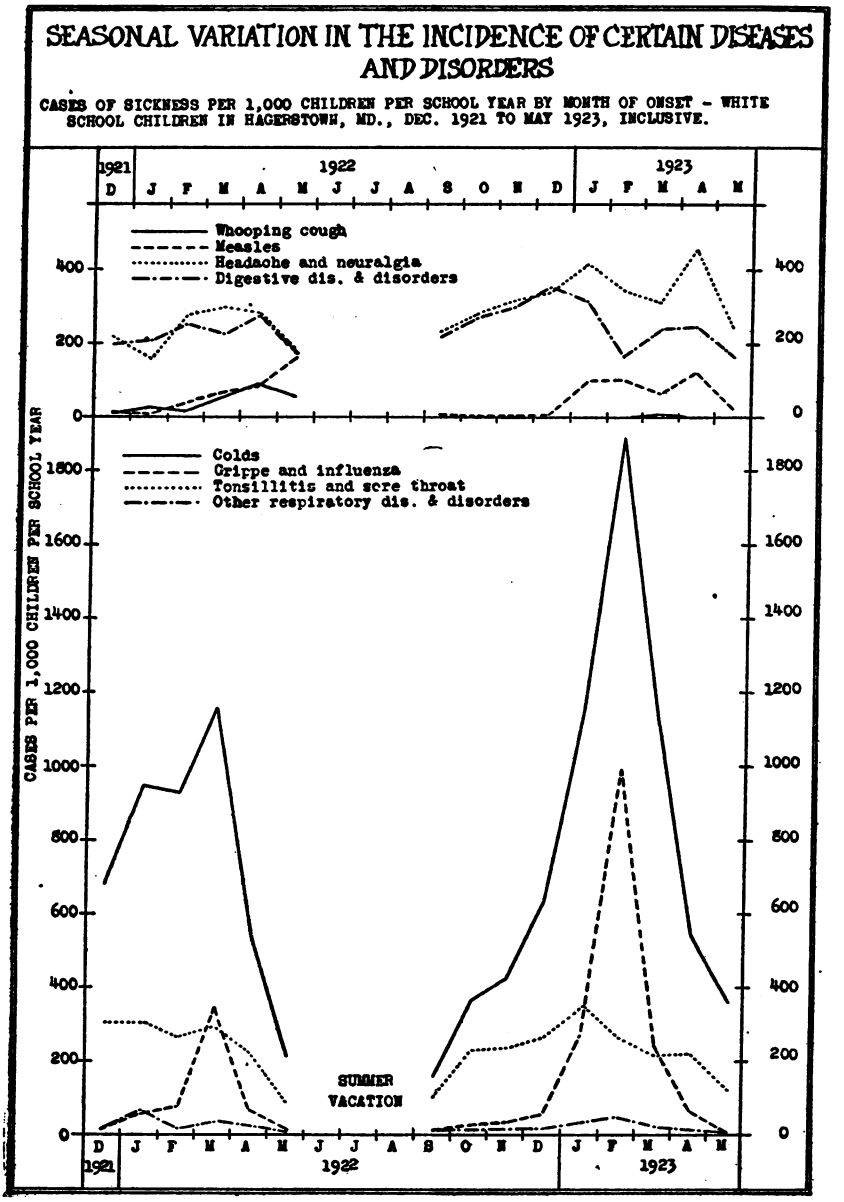


FIG. 8

but the frequency of measles, on the other hand, was about equal to that of the preceding year.

Headaches and the digestive disorders do not show any marked seasonal variation.

SUMMARY.

Records of sickness were kept for a large proportion of the school children in Hagerstown, Md., for the last six months of the 1921–22 school year, and for the entire school year of 1922–23.

The case rates and the days lost per child for all causes of sickness combined and the number of school days lost per case of illness were computed for each year of age. In all instances the rates declined as the age increased. The number of days lost per child showed the most rapid and the case rate the least rapid decline.

The case rates and the number of days lost per child were consistently higher for girls than boys, but the days lost per case of illness was practically the same for each sex.

An analysis of the causes of sickness showed that colds were the most common causative factor, both in case frequency of illness and days lost per child. As measured in days lost per child, influenza and measles were next, but the case frequency of headache, the digestive disorders, and tonsillitis and sore throat, was greater than that for either influenza or measles.

The duration of a case of illness, as measured by school days lost per case, was computed for each disease. Whooping cough, scarlet fever, pneumonia, diphtheria, and measles head the list in the order named. Common colds, the digestive disorders, toothache, and headache, some of the most common causes of illness as measured by case frequency, are of minor importance from the standpoint of the number of days lost per case.

The incidence of the common diseases of children decreased rapidly with age. The rates for tonsillitis and sore throat, headache, and accidents increased up to 11 or 12 years and then declined. Common colds decreased until about 13 years of age, after which there was a slight increase. Toothache and the digestive disorders showed little tendency to vary with age, though possibly increasing slightly up to about 10 years and then declining.

The variation in the rates for the different months was large for the respiratory affections but not nearly so marked for the non-respiratory conditions. The highest rates obtained during March in 1922 and during February in 1923. They were clearly associated with the epidemics of colds and influenza which occurred during those months.

Appendix.

The following tables show in greater detail the data used in this study. Table 8 shows rates for all causes by age, and Table 9 shows rates for all ages by cause for each of the two school years separately.

Tables 10 and 11 show cases and absences separately for the school year 1922-23. Table 12 shows certain rates and percentages that may be used for comparison with other studies in which the rates are calculated on a basis different from that adopted for this study.

TABLE 8.—*Morbidity from all causes by age in the two school years, December, 1921, to May, 1922, and September, 1922, to May, 1923—white school children of both sexes in Hagerstown, Md.*

School year.	All ages.	Age nearest birthday.											
		6 and under.	7	8	9	10	11	12	13	14	15	16 and over.	Unknown age.
CASES PER 1,000 CHILDREN PER SCHOOL YEAR OF 180 SCHOOL DAYS.													
1921-22	2,114	2,866	2,470	2,153	2,436	2,016	1,893	1,991	1,734	1,687	1,829	1,730	2,652
1922-23	2,438	2,835	2,954	3,033	2,592	2,443	2,251	2,447	2,260	2,254	1,919	2,101	2,003
SCHOOL DAYS LOST PER 1,000 CHILDREN PER SCHOOL YEAR OF 180 SCHOOL DAYS.													
1921-22	7,455	14,393	12,657	9,990	8,257	5,739	5,069	5,543	4,031	4,476	4,198	3,810	10,178
1922-23	7,218	11,513	11,000	9,749	8,055	6,816	5,948	6,281	5,825	5,751	4,908	4,955	5,855
SCHOOL DAYS LOST PER CASE OF SICKNESS.													
1921-22	3.53	5.02	5.12	4.64	3.39	2.85	2.68	2.78	2.32	2.65	2.29	2.14	3.84
1922-23	2.96	4.06	3.72	3.21	3.11	2.78	2.64	2.57	2.58	2.55	2.56	2.36	2.92
NUMBER OF CASES OF SICKNESS.													
1921-22	5,236	496	701	632	566	485	424	417	307	291	280	421	216
1922-23	12,611	727	1,478	1,599	1,256	1,095	1,017	1,067	970	832	531	1,006	1,039
NUMBER OF DAYS LOST FROM SICKNESS.													
1921-22	18,467.0	2,490.5	3,592.0	2,932.0	1,918.5	1,381.0	1,135.5	1,159.5	713.5	772.0	642.5	901.0	829.0
1922-23	37,333.0	2,952.5	5,503.5	5,131.0	3,884.5	3,048.5	2,683.5	2,738.5	2,500.5	2,123.0	1,358.0	2,372.0	3,037.5

NUMBER OF INDIVIDUAL CHILDREN.

1921-22	3,712	256	417	433	343	357	338	313	265	257	235	367	131
1922-23	5,126	252	491	517	477	442	446	434	426	366	276	475	524

NUMBER OF DAYS OF EXPOSURE.

1921-22	445,868	31,147	51,084	52,829	41,823	43,314	40,325	37,651	31,862	31,048	27,552	42,572	14,661
1922-23	931,042	46,160	90,055	94,732	86,804	80,511	81,210	78,485	77,272	66,449	49,807	86,173	93,384

NUMBER OF FULL-TIME SCHOOL YEARS OF EXPOSURE.

1921-22	2,477.04	173.04	283.80	293.49	232.35	240.63	224.03	209.17	177.01	172.49	153.07	236.51	81.45
1922-23	5,172.46	256.44	500.31	526.29	482.24	447.28	451.17	436.03	429.29	369.16	276.71	478.74	518.80

TABLE 9.—*Morbidity from certain causes among white school children of both sexes and all ages in the two school sessions, December, 1921, to May, 1922, and September, 1922, to May, 1923, in Hagerstown, Md.*

Diagnosis.	Cases per 1,000 children per school year of 180 school days.		School days lost per 1,000 children per school year of 180 school days.		School days lost per case of sickness.		Number of cases of sickness.		Number of days lost from sickness.	
	1921–22	1922–23	1921–22	1922–23	1921–22	1922–23	1921–22	1922–23	1921–22	1922–23
All causes	2,114	2,438	7,455	7,218	3.53	2.96	5,236	12,611	18,467.0	7,333.0
Measles	64	48	798	570	12.51	11.98	158	246	1,976.0	2,946.0
Mumps	1	1	6	6	8.00	4.71	2	7	16.0	33.0
Whooping cough	42	-------	1,039	14	24.99	35.50	103	2	2,574.0	71.0
Chicken pox	11	14	91	124	8.04	8.69	28	74	225.0	643.0
Scarlet fever	2	5	24	130	11.80	25.88	5	26	59.0	673.0
Diphtheria	2	5	38	81	18.80	16.84	5	25	94.0	421.0
Croup	17	16	44	47	2.56	2.87	43	85	110.0	244.0
Colds	746	743	1,874	1,853	2.51	2.49	1,848	3,843	4,642.0	9,583.0
Grippe and influenza	100	189	502	1,179	5.02	6.23	248	978	1,244.0	6,096.0
Tonsilitis and sore throat	242	221	676	601	2.79	2.72	599	1,144	1,674.0	3,110.5
Bronchitis and cough	16	9	79	59	5.03	6.28	39	49	196.0	307.5
Pneumonia	8	4	138	90	18.00	21.09	19	22	342.0	464.0
Other respiratory diseases and disorders	3	6	37	18	11.50	3.05	8	30	92.0	91.5
Digestive diseases and disorders	219	244	416	460	1.90	1.88	542	1,262	1,030.0	2,377.0
Toothache and diseases of the teeth	88	129	145	193	1.64	1.50	219	667	359.5	1,000.5
Earache and ear diseases	44	53	113	134	2.59	2.55	108	273	280.0	695.0
Diseases of the eyes	58	35	198	98	3.41	2.79	144	182	491.0	507.0
Headache and neuralgia	234	324	303	364	1.30	1.12	579	1,677	750.5	1,885.0
Scabies	7	2	76	20	11.06	13.25	17	8	188.0	106.0
Pediculosis	8	4	70	40	9.08	10.35	19	20	172.5	207.0
Other skin diseases	15	33	71	139	4.66	4.23	38	170	177.0	719.0
Accidents, minor and major	45	89	131	253	2.92	2.84	111	461	324.0	1,308.0
Tonsil or adenoid operations	12	7	127	66	10.86	10.06	29	34	315.0	342.0
Menstruation	16	17	20	19	1.21	1.11	40	89	48.5	98.5
Other diseases and disorders	67	70	327	260	4.88	3.71	166	362	810.0	1,344.0
Unknown diagnosis	48	169	112	398	2.33	2.35	119	875	277.0	2,060.5

	1921–22	1922–23
Number of individual children	3,712	5,378
Number of days of exposure	445,868	931,042
Full-time school years of exposure	2,477.04	5,172.46

TABLE 10.—*Excess of absences over cases of illness from certain diagnoses, days lost per case and days lost per absence—white school children of both sexes and all ages in Hagerstown, Md., September, 1922, to May, 1923, inclusive.*

Diagnosis.	Number of cases.	Number of absences.	Number of absences not counted as cases.	Percentage of absences not counted as cases to number of cases.	School days lost per case.	School days lost per absence.
All causes	12,611	13,269	658	5.2	2.96	2.81
Measles	246	251	5	2.0	11.98	11.74
Mumps	7	7			4.71	4.71
Whooping cough	2	2			35.50	35.50
Chicken pox	74	74			8.69	8.69
Scarlet fever	26	26			25.88	25.88
Diphtheria	25	26	1	4.0	16.84	16.19
Croup	85	88	3	3.5	2.87	2.77
Colds	3,843	4,186	343	8.9	2.49	2.29
Grippe and influenza	978	1,081	103	10.5	6.23	5.64
Tonsillitis and sore throat	1,144	1,199	55	4.8	2.72	2.59
Bronchitis and cough	49	50	1	2.0	6.28	6.15
Pneumonia	22	22			21.09	21.09
Other respiratory diseases and disorders	30	32	2	6.7	3.05	2.86
Digestive diseases and disorders	1,262	1,312	50	4.0	1.88	1.81
Toothache and diseases of the teeth	667	687	20	3.0	1.50	1.46
Earache and ear diseases	273	284	11	4.0	2.55	2.45
Diseases and disorders of the eyes	182	195	13	7.1	2.79	2.60
Headache and neuralgia	1,677	1,683	6	.4	1.12	1.12
Scabies	8	8			13.25	13.25
Pediculosis	20	25	5	25.0	10.35	8.28
Other skin diseases and disorders	170	176	6	3.5	4.23	4.09
Accidents, minor and major	461	476	15	3.3	2.84	2.75
Tonsil or adenoid operations	34	34			10.06	10.06
Menstruation	89	89			1.11	1.11
Other diseases and disorders	362	381	19	5.2	3.71	3.53
Unknown diagnosis	875	875			2.35	2.35

TABLE 11.—*Excess of absences over cases of illness from all causes, days lost per case, and days lost per absence, by age—white school children of both sexes in Hagerstown, Md., September, 1922, to May, 1923, inclusive.*

	All ages.	Age nearest birthday.											
		6 and under.	7	8	9	10	11	12	13	14	15	16 and over.	Unknown age.
Number of cases	12,611	727	1,478	1,599	1,250	1,095	1,017	1,067	970	832	531	1,006	1,039
Number of absences	13,269	763	1,569	1,707	1,330	1,144	1,051	1,128	1,018	861	556	1,057	1,085
Excess of absences over cases	658	36	91	108	80	49	34	61	48	29	25	51	46
Percentage of excess to number of cases	5.2	5.0	6.2	6.8	6.4	4.5	3.3	5.7	4.9	3.5	4.7	5.1	4.4
School days lost per case	2.96	4.06	3.72	3.21	3.11	2.78	2.64	2.57	2.58	2.55	2.56	2.36	2.92
School days lost per absence	2.81	3.87	3.51	3.01	2.92	2.66	2.55	2.43	2.46	2.47	2.44	2.24	2.80

TABLE 12.—*Morbidity case and severity rates from certain causes per 10,000 days enrolled and the percentage of cases and of days lost due to each diagnosis—white school children of both sexes and all ages in Hagerstown, Md., December, 1921, to May, 1923, inclusive.*

Diagnosis.	Cases per 10,000 days enrolled.		School days lost per 10,000 days enrolled.		Percentage of cases from all causes due to each diagnosis.	Percentage of days lost from all causes due to each diagnosis.	Number of cases.		Number of days lost.	
	All cases.	Cases causing a loss of 2 days or longer.	All cases.	Cases causing a loss of 2 days or longer.			All cases.	Cases causing a loss of 2 days or longer.	All cases.	Cases causing a loss of 2 days or longer.
All causes	129.6	69.6	405.3	354.0	100.0	100.0	17,847	9,582	55,800.0	48,748.0
Measles	2.9	2.9	35.7	35.7	2.3	8.8	404	403	4,922.0	4,921.0
Mumps	.1	.1	.4	.3	.1	.1	9	8	49.0	48.0
Whooping cough	.8	.8	19.2	19.2	.6	4.7	105	105	2,645.0	2,645.0
Chicken pox	.7	.7	6.3	6.3	.6	1.6	102	101	868.0	867.0
Scarlet fever	.2	.2	5.3	5.3	.2	1.3	31	31	732.0	732.0
Diphtheria	.2	.2	3.7	3.7	.2	.9	30	30	515.0	515.0
Croup	.9	.5	2.6	2.2	.7	.6	128	74	354.0	306.0
Colds	41.3	23.3	103.3	86.9	31.9	25.5	5,691	3,207	14,225.0	11,972.0
Grippe and influenza	8.9	8.6	53.3	53.0	6.9	13.2	1,226	1,186	7,340.0	7,302.0
Tonsillitis and sore throat	12.7	7.9	34.7	30.4	9.8	8.6	1,743	1,090	4,784.5	4,192.0
Bronchitis and cough	.6	.5	3.7	3.6	.5	.9	88	75	503.5	492.0
Pneumonia	.3	.3	5.9	5.9	.2	1.4	41	41	806.0	806.0
Other respiratory diseases and disorders	.3	.2	1.3	1.3	.2	.3	38	26	183.5	173.5
Digestive diseases and disorders	13.1	5.0	24.7	18.0	10.1	6.1	1,804	693	3,407.0	2,483.0
Toothache and diseases of the teeth	6.4	2.0	9.9	6.3	5.0	2.4	886	280	1,360.0	869.0
Earache and ear diseases	2.8	1.4	7.1	5.8	2.1	1.7	381	187	975.0	803.0
Diseases and disorders of the eyes	2.4	1.5	7.2	6.5	1.8	1.8	326	211	998.0	900.0
Headache and neuralgia	16.4	3.4	19.1	9.0	12.6	4.7	2,256	463	2,635.5	1,237.5
Scabies	.2	.2	2.1	2.1	.1	.5	25	24	294.0	293.0
Pediculosis	.3	.3	2.8	2.7	.2	.7	39	36	379.5	377.0
Other skin diseases and disorders	1.5	1.0	6.5	6.1	1.2	1.6	208	142	896.0	835.5
Accidents, minor and major	4.2	2.3	11.9	10.2	3.2	2.9	572	311	1,632.0	1,409.5
Tonsil or adenoid operations	.5	.4	4.8	4.8	.4	1.2	63	61	657.0	655.0
Menstruation	.9	.2	1.1	.4	.7	.3	129	27	147.0	68.0
Other diseases and disorders	3.8	2.3	15.6	14.3	3.0	3.9	528	317	2,154.0	1,973.0
Unknown diagnosis	7.2	3.3	17.0	13.6	5.6	4.2	994	453	2,337.5	1,873.0

A STUDY OF RAGWEED POLLEN EXTRACTS FOR USE IN THE TREATMENT OF RAGWEED POLLEN HYPERSENSITIVENESS.

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Numerous authors have reported gratifying results in the treatment of hay fever by means of repeated hypodermic injection of extracts made from the specific pollen to which the patient is sensitive. Pollen extracts are, however, prepared in many different ways. Different methods of collecting and cleaning the pollen granules result in variations in the degree of maturity and purity of the stock pollen from which the extracts are prepared. Various extractives and preservatives are employed, many different methods of extraction are used, and the time employed in the extraction varies. Some experimenters have attempted by various means to purify and concentrate the extracts. As a result of this lack of uniformity in the preparation of extracts from any given pollen, a considerable variation in potency, keeping qualities, etc., may be expected.

The work herein reported was carried out with the pollen of ragweed (*Ambrosia elatior* and *Ambrosia trifida*), since ragweed is the commonest cause of hay fever in the eastern portion of the United States; and it was undertaken in an effort to select from a large number of variously prepared pollen extracts one which would possess the qualities of an extract suitable for use in treatment. Uniformity of strength in different batches of extract, a high degree of specificity and potency, good keeping qualities, and a tendency to inhibit bacterial growth are among the qualities deemed desirable in such an extract.

METHODS.

Clock (1), in 1918, demonstrated that rabbits could be immunized with an extract of ragweed pollen and thus bring about the production of antibodies capable of fixing complement. The work herein reported represents a further application of this method to the study of ragweed pollen extracts.

PROCEDURE.

Immunization of rabbits.—Adult rabbits were injected intraperitoneally on alternate days, for a period of about three weeks, with increasing amounts of ragweed pollen extract (5 to 50,000 units [1]). The animals were bled on the seventh day.

Complement fixation—Titration of antigen.—Immune rabbit serum was employed in 0.011 c. c. amounts. Antigen (pollen extract) was used in amounts of from 5 to 100 pollen units. Two units of anti-sheep amboceptor [2] were used. Guinea pig complement titrated in the presence of an average dose of antigen was utilized in 2-unit [3] amounts. Sheep cells were used as an indicator (0.2 c. c. of 1.2 per cent suspension of packed cells). The total volume of fluid in each tube was 1.1 c. c.

Fixation was carried out at an ice-box temperature of from 5 to 8° C. for 18 hours.

This test gave clean-cut results and was highly delicate, with a potent antigen and antiserum fixation of complement occurring with as little as 5 to 10 units of the extract.

POLLEN A COMPLEX ANTIGENIC SUBSTANCE.

When the structure and physiology of a pollen granule are considered, it seems probable that it would contain more than a single

[1] A unit as used in this paper refers to the extract from 0.000001 gm. of dry mature pollen as defined by L. Noon (2).

[2] A unit of amboceptor is defined as the least amount giving complete hemolysis of 0.2 c. c. of 1.2 per cent suspension of sheep cells in the presence of 0.2 c. c. of 1: 20 dilution of guinea pig complement after one hour in the 37.5° C. water bath.

[3] A unit of complement is defined as the least amount, following a preliminary incubation of one hour at 37.5° C., causing complete hemolysis of 0.2 c. c. of 1.2 per cent sheep cell suspension in the presence of 2 units of amboceptor and an average dose of antigen (50 units).

antigenic principle, and this appears to be indicated from the following observations:

Two rabbits, No. 1 and No. 2, were immunized in the same manner at the same time and with the same ragweed pollen extract which we will designate as extract "A."

Antisera from rabbits No. 2 and No. 3, when tested against extract "A," were found to be of equal strength, each fixing complement in the presence of a minimal dose of 20 units of the extract.

When, however, extract "B," prepared in a slightly different manner, was substituted for extract "A," antiserum from rabbit No. 2 fixed complement in the presence of 10 units of antigen "D," whereas antiserum from rabbit No. 3 failed to fix complement in the presence of antigen "D" used in doses ranging from 5 to 100 pollen units. This observation was repeatedly checked and proved constant for these antisera and extracts. The explanation of this phenomenon would seem to be that the two rabbits had produced their predominating antibodies against slightly different fractions of the antigen, and that extracts "A" and "D" contained these antigenic fractions in different proportions.

Moreover, when a series of extracts was prepared from equal quantities of pollen by using various extractives, and was tested for complement binding power against a single antiserum, quantitative variations were common. Some extracts gave strong and others weak binding of complement, while in still others this property of the extract, present at first, was soon entirely lost. Again, mainly in extracts in which an effort was made at concentration or purification, the complement-binding properties were entirely absent.

It was found, moreover, that when an extract containing 10,000 units per c. c. in 2 parts glycerine and 1 part Coca's fluid,[4] was diluted fifty times with saline, and heated to 65° C. for 30 minutes, it lost entirely its complement-binding power for its original antiserum. This heated extract was still capable, however, of producing an antiserum in rabbits which was specific for itself. The complement-fixing bodies were considerably more resistant to the action of heat when the latter was applied to the undiluted glycerinated extract.

COMPLEMENT-FIXING PROPERTIES OF VARIOUS COMMERCIAL EXTRACTS.

In view of the quantitative and qualitative variations noted in the complement binding power of various experimental extracts, it was deemed desirable to test these properties in commercial products. For this purpose several commercial extracts prepared from short ragweed pollen were secured and used for the immunization of rabbits. With the antisera thus produced and with the various extracts, cross tests were made. The results are shown in Table 1.

[4] Coca's fluid is prepared by dissolving sodium chloride 5 gms. and sodium bicarbonate 2.7 gms. in distilled water 1,000 c.c.

TABLE 1.—*Cross complement fixation with short ragweed pollen extracts and antisera.*

[Figures indicate binding with minimum number of units noted. Minus sign indicates no binding.]

Rabbit antiserum produced against extract.	No. 8. Experimental extract (same as No. 7, except heated to 65° C. for 30 minutes).	No. 7. Experimental extract.	No. 6. Commercial.	No. 5. Commercial.	No. 4. Commercial.	No. 3. Commercial.	No. 2. Commercial.	No. 1. Commercial.	Short ragweed pollen extract.
	Units.	*Units.*	*Units.*	*Units.*	*Units.*	*Units.*	*Units.*	*Units.*	*Units.*
No. 1. Commercial	—	—	—	—	—	—	—	—	------
No. 1. Commercial (second rabbit)	—	[1] 100	—	—	—	—	—	—	------
No. 2. Commercial	—	10	—	—	—	—	20	—	------
No. 3. Commercial	—	—	—	—	—	—	—	—	------
No. 3. Commercial (second rabbit)	—	—	—	—	—	—	—	—	------
No. 4. Commercial	—	—	—	—	—	—	—	—	------
No. 4. Commercial (second rabbit)	—	—	—	—	—	—	—	—	------
No. 5. Commercial	—	—	—	—	—	—	—	—	------
No. 7. Experimental extract	—	10	[1] 100	—	—	—	20	—	------
No. 8. Experimental extract (same as No. 7 except heated to 65° for 30 minutes)	60	—	—	—	—	—	—	—	------

[1] Partial.

It may be noted in Table 1 that the commercial extracts which were used failed, with one exception, to produce antibodies in rabbits. The same dosage, measured in units, was used in each case and the methods of immunization were identical. This method uniformly gave potent antisera in a considerable number of animals immunized with extracts Nos. 2, 7, and 8 of Table 1. The character of the extract probably accounts for the failure of Cook, Flood, and Coca (3) in their attempts to produce complement-fixing antibodies in rabbits in 1917.

Extract No. 7, Table 1, was selected for further study on account of its strength and polyvalency when tested with antisera produced against a large number of experimental extracts and on account of its potency in producing dermal reactions in sensitive individuals. A dose of one thirty-two hundredth of a unit of this extract gave a definite intra-dermal reaction in sensitive cases.

This extract was prepared by extracting ripe, dry, pollen granules in a mixture of 2 parts glycerin [5] and 1 part Coca's fluid, a combination suggested by Dr. H. S. Bernton.[6]

Preparation of the extract.—The mature pollen granules were collected by placing the flowering plants in pails of water in a still room, with the blossoms projecting over waxed paper. The pollen was prepared for extraction by passing through a 200-mesh sieve, followed by drying over sulphuric acid. If not used at once, the

[5] Clock had previously made use of glycerin as a preservative for pollen extract.

[6] In view of the apparent lability of the complement-binding property of some extracts it was deemed desirable to have the preservative action of glycerin present during the extraction rather than add it later.

pollen was weighed, and sealed in glass ampules under reduced pressure. Extraction was allowed to continue for eight days at room temperature,[7] with occasional shaking. The extract was then filtered, and, if sterile, was considered ready for use.

Grinding of the pollen in a mortar with quartz sand, etc., uniformly resulted in a loss of complement-binding power in the extract—probably due to the fact that the foreign material removed portions of the antigenic fraction by absorption.

EXTRACTS PREPARED WITH NASAL SECRETIONS.

In view of the quantitative and qualitative variations noted in differently prepared extracts it was felt that the use of strong chemicals and rough manipulations in the preparation of extracts should be reduced to a minimum. In other words, it was felt that an extract for specific treatment should imitate the extract secured by the patient when pollen granules gain access to his nasal mucous membranes. In order that we might study this extract, a quantity of nasal secretion collected from several patients during hay fever attacks was secured, promptly pooled, and ripe pollen added.

In order to imitate natural conditions, the extraction was terminated after 15 minutes, the material was passed through a Berkefeld filter, and 50 per cent glycerin was added as a preservative. This extract was then tested against antisera produced by the injection of various pollen extracts into rabbits. It was found that the extract was strongly antigenic for certain antisera but gave no binding with others. The antisera produced against the Coca's fluid and glycerin extract bound complement with this nasal secretion in 10 unit amounts.

ANTIBODIES IN THE SERA OF PATIENTS SENSITIVE TO RAGWEED POLLENS.

Clowes (5), Walker (6), and others have reported the occasional finding of complement-binding antibodies in the sera of hay fever and asthma patients, and it was felt that perhaps the character of the antigen was the reason for the usually negative results.

Tests were made with the above-described glycerin—Coca's fluid antigen—since it seemed similar to the nasal-secretion extract and also with other extracts, including a suspension of the whole pollen. A total of 70 patients were tested, some before and some after treatment, using varying amounts of serum and antigen and employing both native and guinea-pig complement. The results were uniformly negative. That there was nothing in the human sera which prevented fixation is indicated by the fact that with rabbit antisera fixation took place readily in the presence of human serum. We were also unable to demonstrate complement-fixing antibodies in guinea pigs tested at varying intervals following intraperitoneal injections of extract.

[7] Complement-fixation tests showed the extraction to be complete at the end of five days when 1 gram of pollen and 100 mils of extractive were employed; but when 2 grams of pollen were used with the same volume of extractive an increase in complement-binding power was noted to the seventh day.

KEEPING QUALITIES.

Since the glycerinated extract was highly potent and seemed similar to that causing hay fever in nature, it was felt that it should be a suitable extract for treatment, provided its keeping qualities were good.

Bottles of concentrated extract allowed to stand at room temperature showed no appreciable loss of complement-fixing power after 144 days.

Tests were also made of the keeping qualities of the extract in dilution (100 units per c. c. in 0.85 per cent saline) and at varying hydrogen ion concentrations of from pH 9.2 to 5.8 when left at ice-box temperature. Slight deterioration was first noted after 114 days. Buffered solutions were not employed, and the pH values varied somewhat. However, the evidence seemed conclusive that the antigen tended to be very stabile in dilution and that the hydrogen ion concentration in the range tested exerted no marked influence upon the keeping qualities.

The results of treatment likewise indicate the stability of the glycerinated extract, since, when a dilution used for some days in the treatment of a patient is replaced by a new dilution, the transfer is without reactions, thus indicating a uniform strength of the two preparations. (The results of treatment with this extract will be reported later.)

COMPLEMENT-FIXING ANTIBODIES RELATIVELY LABILE.

That the complement-fixing antibodies are a sensitive criterion of the keeping quality of an extract is indicated by the fact that change in the property of complement fixation is one of the first alterations in an extract to become apparent, since an extract may lose this property naturally or have it destroyed by heating without apparent loss in its power to produce skin reactions in sensitive individuals.

RELATIONSHIP OF SHORT AND GIANT RAGWEED POLLEN EXTRACTS

The writers, in a previous paper (4), have shown that giant and short ragweed extracts behave qualitatively quite similarly toward the sensitized guinea pig. It is possible, however, to distinguish the two by the use of cross fixation tests using several sera, binding being more pronounced with the homologous sera and antigen.

TABLE 2.—*Cross fixation using giant and short ragweed extract against short and giant ragweed antisera.*

Pollen extract.	Rabbit antisera.					
	Anti-short, rabbit sera No. 2.	Anti-short, rabbit sera No. 5.	Anti-short, rabbit sera No. 10.	Anti-giant, rabbit sera No. 16.	Anti-giant, rabbit sera No. 18.	Anti-giant, rabbit sera No. 21.
Short	10	10	40	60	(*Partial.*) 100	(*Partial.*) 100
Giant	50	40	(1)	10	10	10

[1] Not in 100.

VALUE OF THE COMPLEMENT-FIXING PROPERTIES OF POLLEN EXTRACTS IN TREATMENT.

We do not wish to imply that the complement-fixing body has any value in the actual treatment of hay fever cases (this phase of the question will be reported upon later); but we feel that it does offer a method for the study of extracts as regards their specificity and keeping qualities.

SUMMARY.

1. Complement fixation offers a method for studying the specificity and keeping qualities of pollen extracts.

2. An extract of mature ragweed pollen in glycerine 2 parts, Coca's fluid 1 part, gives a stabile, potent, specific, bacteria-resisting extract.

3. This extract can be kept for long periods of time without apparent deterioration.

4. No antibodies were demonstrated in the sera of sensitive patients either before or after prophylactic treatment.

5. Short and giant ragweed pollen extracts tested with their respective antisera give cross fixation, but can be distinguished from each other by the relative strength of the reactions.

ACKNOWLEDGMENTS.

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DEATHS DURING WEEK ENDED SEPTEMBER 6, 1924.

Summary of information received by telegraph from industrial insurance companies for week ended September 6, 1924, and corresponging week of 1923. (From the Weekly Health Index September 9, 1924, issued by the Bureau of the Census Department of Commerce.)

	Week ended September 6, 1924.	Corresponding week, 1923.
Policies in force	56, 873, 682	53, 319, 916
Number of death claims	7, 418	7, 656
Death claims per 1,000 policies in force, annual rate	6. 8	7. 5

Deaths from all causes in certain large cities of the United States during the week ended September 6, 1924, infant mortality, annual death rate, and comparison with corresponding week of 1923. (From the Weekly Health Index, September 9, 1924, issued by the Bureau of the Census, Department of Commerce.)

City.	Week ended Sept. 6, 1924.		Annual death rate per 1,000 corresponding week, 1923.	Deaths under 1 year.		Infant mortality rate, week, ended Sept. 6, 1924.[2]
	Total deaths.	Death rate.[1]		Week ended Sept. 6, 1924.	Corresponding week, 1923.	
Total (65 cities)	5,669	10.9	[3] 10.5	823	[3] 843	
Akron	26			4	6	42
Albany [4]	25	11.0	15.1	3	4	68
Atlanta	60	13.7	17.3	11	5	
Baltimore [4]	176	11.7	14.2	30	34	89
Birmingham	45	11.7	16.5	8	10	
Boston	164	11.0	9.3	23	19	64
Bridgeport	23			4	3	64
Buffalo	140	13.4	11.6	22	22	93
Cambridge	25	11.6	11.2	3	5	52
Camden	29	12.0	12.6	4	9	66
Chicago [4]	522	9.3	9.2	86	94	80
Cincinnati	87	11.1	14.2	11	16	69
Cleveland	163	9.3	9.9	33	33	84
Columbus	49	9.6	14.8	5	12	47
Dallas	35	9.7	6.9	3	2	
Dayton	21	6.5	9.8	5	5	84
Denver	77			16	11	
Des Moines	36	12.9	9.6	0	2	0
Detroit	233			40	63	74
Duluth	14	6.7	4.4	1	1	22
Erie	19			2	2	41
Fall River [4]	23	9.9	12.9	5	11	70
Flint	15			3	5	52
Fort Worth	17	6.0	6.9	2	4	
Grand Rapids	23	8.1	9.3	1	3	16
Houston	33			3	3	
Indianapolis	88	13.1	10.8	16	15	118
Jacksonville, Fla	32	16.3	11.5	3	0	
Jersey City	82	13.7	8.3	14	12	100
Kansas City, Kans	28	12.4	10.4	2	2	39
Kansas City, Mo	62	9.0	10.8	8	7	
Los Angeles	175			21	23	66
Louisville	65	13.1	17.2	13	10	122
Lowell	25	11.3	13.1	5	6	89
Lynn	16	8.0	8.1	2	3	51
Memphis	99	27.2	11.3	19	5	
Milwaukee	71	7.5	9.8	6	16	28
Minneapolis	67	8.4	10.3	9	7	48
Nashville [4]	46	19.4	17.0	7	3	
New Bedford	19	7.5	11.2	5	5	78
New Haven	32	9.5	10.6	4	3	53
New Orleans	133	16.9	16.0	16	13	
New York	1,246	10.8	9.2	157	180	64
Bronx Borough	135	8.1	8.3	8	20	28
Brooklyn Borough	426	10.1	8.6	69	69	73
Manhattan Borough	547	12.6	10.4	66	75	67
Queens Borough	95	8.9	7.6	9	11	45
Richmond Borough	43	17.2	12.7	5	5	91
Newark, N. J	98	11.5	10.1	19	9	89
Norfolk	32	10.2	8.5	5	4	89
Oakland	35	7.4	8.5	1	4	13
Oklahoma City	21	10.5		3		
Omaha	37	9.3	11.7	7	9	75
Paterson	31	11.5	6.4	7	4	119
Philadelphia	424	11.3	10.4	74	60	94
Pittsburgh	147	12.2	13.4	23	24	78
Portland, Oreg	46	8.6	10.3	8	2	83
Providence	55	11.8	11.4	13	10	106
Richmond	67	19.0	13.8	13	7	158
Rochester	70	11.2		11		87
St. Louis	159	10.2	9.9	10	15	
St. Paul	40	8.5	9.9	6	8	51
Salt Lake City [4]	28	11.4	10.3	1	4	20

[1] Annual rate per 1,000 population.
[2] Deaths under 1 year per 1,000 births—an annual rate based on deaths under 1 year for the week and estimated births for 1923. Cities left blank are not in the registration area for births.
[3] Data for 63 cities.
[4] Deaths for week ended Friday, September 5, 1924.

Deaths from all causes in certain large cities of the United States during the week ended September 6, 1924, infant mortality, annual death rate, and comparison with corresponding week of 1923. (From the Weekly Health Index, September 9, 1924, issued by the Bureau of the Census, Department of Commerce.)—Continued.

City.	Week ended Sept. 6, 1924.		Annual death rate per 1,000 corresponding week, 1923.	Deaths under 1 year.		Infant mortality rate, week ended Sept. 6, 1924.
	Total deaths.	Death rate.		Week ended Sept. 6, 1924.	Corresponding week, 1923.	
San Antonio	31	8.4	14.1	5	11	
San Francisco	136	12.9	11.9	8	10	48
Schenectady	14	7.3	8.4	2	3	59
Seattle	51			2	6	20
Somerville	19	9.9	10.0	1	4	27
Spokane	23			0	1	0
Springfield, Mass	27	9.5	10.1	6	4	101
Syracuse	32	8.9	10.7	2	6	25
Tacoma	32	16.2	7.7	5	2	120
Toledo	62	11.7	8.5	5	10	47
Trenton	29	11.7	9.8	5	5	83
Utica	16	7.9	12.6	0	5	0
Washington, D. C	107	11.5	11.5	18	21	104
Waterbury	12			4	4	93
Wimington, Del	37	16.1	7.1	5	2	112
Worcester	43	11.5	12.2	8	5	96
Yonkers	24	11.4	7.3	6	5	131
Youngstown	14	4.7	13.9	4	12	55

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 Week Ended September 13, 1924.

ARIZONA.

	Cases.
Diphtheria	4
Measles	1
Mumps	2
Scarlet fever	5
Tuberculosis	161
Typhoid fever	9
Whooping cough	4

ARKANSAS.

Chicken pox	5
Diphtheria	8
Hookworm disease	3
Influenza	8
Malaria	143
Measles	30
Mumps	5
Paratyphoid fever	1
Pellagra	2
Scarlet fever	8
Trachoma	4
Tuberculosis	3
Typhoid fever	43
Whooping cough	22

COLORADO.

(Exclusive of Denver.)

Anthrax	1
Chicken pox	1
Diphtheria	10
Impetigo contagiosa	1
Measles	4
Paratyphoid fever	1
Scarlet fever	8
Trachoma	1
Trichinosis	1
Tuberculosis	88
Typhoid fever	7
Whooping cough	8

CONNECTICUT.

Cerebrospinal meningitis	1
Conjunctivitis (infectious)	1

CONNECTICUT—continued.

	Cases.
Diphtheria	25
Dysentery (bacillary)	1
Lethargic encephalitis	1
Malaria	1
Measles	4
Mumps	14
Pneumonia (lobar)	6
Poliomyelitis	8
Scarlet fever	24
Trachoma	1
Tuberculosis (all forms)	42
Typhoid fever	8
Whooping cough	29

DELAWARE.

Influenza	1
Measles	1
Mumps	1
Scarlet fever	1
Tuberculosis	1
Typhoid fever	2

FLORIDA.

Cerebrospinal meningitis	1
Diphtheria	16
Influenza	3
Malaria	24
Pneumonia	2
Typhoid fever	9
Typhus fever	2

GEORGIA.

Dengue	1
Diphtheria	13
Dysentery (bacillary)	1
German measles	1
Hookworm disease	6
Malaria	22
Measles	1
Mumps	7
Paratyphoid fever	3
Pellagra	1

GEORGIA—continued.

	Cases.
Pneumonia	2
Scarlet fever	4
Septic sore throat	1
Smallpox	2
Tetanus	1
Trachoma	1
Trichinosis	1
Tuberculosis	7
Typhoid fever	21
Whooping cough	4

ILLINOIS.

Cerebrospinal meningitis—Cook County	1
Diphtheria:	
Cook County	43
Scattering	36
Influenza	3
Lethargic encephalitis—Macon County	1
Measles	19
Pneumonia	78
Poliomyelitis:	
Cook County	5
Henry County	1
Johnson County	1
Kane County	1
Kendall County	1
Ogle County	1
Richland County	1
Whiteside County	1
Scarlet fever:	
Cook County	25
Vermilion County	8
Scattering	29
Smallpox	4
Tuberculosis	241
Typhoid fever:	
Cook County	12
Montgomery County	15
Scattering	32
Whooping cough	139

IOWA.

Diphtheria	6
Poliomyelitis—Clinton	19
Scarlet fever	20
Smallpox	5
Typhoid fever	1

KANSAS.

Cerebrospinal meningitis	1
Chicken pox	1
Diphtheria	19
Measles	4
Mumps	18
Pellagra	1
Pneumonia	6
Poliomyelitis	1
Scarlet fever	35
Septic sore throat	1
Tuberculosis	20
Typhoid fever	18
Vincent's angina	1
Whooping cough	14

LOUISIANA.

Cerebrospinal meningitis	1
Diphtheria	13

[1] Week ended Friday.

LOUISIANA—continued.

	Cases.
Hookworm disease	4
Leprosy	1
Malaria	15
Pneumonia	21
Scarlet fever	2
Smallpox	4
Tuberculosis	33
Typhoid fever	6

MAINE.

Chicken pox	5
Diphtheria	5
German measles	1
Influenza	4
Mumps	2
Poliomyelitis	2
Scarlet fever	11
Tuberculosis	12
Typhoid fever	6
Whooping cough	4

MARYLAND.[1]

Chicken pox	1
Diphtheria	22
Dysentery	6
German measles	1
Influenza	13
Lethargic encephalitis	2
Malaria	1
Measles	5
Mumps	7
Pneumonia (all forms)	15
Poliomyelitis	18
Scarlet fever	7
Septic sore throat	2
Tetanus	2
Tuberculosis	59
Typhoid fever	53
Whooping cough	41

MASSACHUSETTS.

Cerebrospinal meningitis	9
Chicken pox	22
Conjunctivitis (suppurative)	12
Diphtheria	47
Lethargic encephalitis	2
Measles	23
Mumps	19
Ophthalmia neonatorum	25
Pneumonia (lobar)	26
Poliomyelitis	34
Scarlet fever	76
Septic sore throat	2
Tetanus	1
Tuberculosis (all forms)	142
Typhoid fever	12
Whooping cough	53

MICHIGAN.

Diphtheria	74
Measles	16
Pneumonia	24
Scarlet fever	69
Smallpox	11
Tuberculosis	27
Typhoid fever	17
Whooping cough	98

MONTANA.

	Cases.
Diphtheria	6
Poliomyelitis:	
Billings, R. F. D	1
Butte	2
Bozeman, R. F. D	3
Manhattan	1
Missoula, R. F. D	1
Missoula	9
Scarlet fever	14
Typhoid fever	2

NEW JERSEY.

Cerebrospinal meningitis	4
Chicken pox	13
Diphtheria	49
Influenza	5
Malaria	2
Measles	14
Pneumonia	37
Poliomyelitis	4
Scarlet fever	26
Smallpox	3
Trachoma	1
Typhoid fever	15
Whooping cough	149

NEW MEXICO.

Anthrax	4
Diphtheria	13
Dysentry	1
Measles	5
Mumps	3
Paratyphoid fever	1
Scarlet fever	5
Tuberculosis	15
Typhoid fever	21
Vincent's angina	2
Whooping cough	200

NEW YORK.

Diphtheria	49
Influenza	3
Lethargic encephalitis	2
Measles	37
Pneumonia	48
Poliomyelitis	51
Scarlet fever	60
Smallpox	3
Typhoid fever	39
Whooping cough	177

NORTH CAROLINA.

Cerebrospinal meningitis	1
Chicken pox	5
Diphtheria	184
German measles	1
Measles	31
Poliomyelitis	1
Scarlet fever	36
Septic sore throat	3

NORTH CAROLINA—continued.

	Cases.
Smallpox	13
Typhoid fever	50
Whooping cough	95

OREGON.

Chicken pox	6
Diphtheria:	
Portland	12
Scattering	6
Measles	2
Mumps	4
Pneumonia	[1] 4
Scarlet fever	13
Smallpox	5
Tuberculosis	5
Typhoid fever	5
Whooping cough	7

SOUTH DAKOTA.

Diphtheria	4
Influenza	1
Mumps	1
Poliomyelitis	1
Scarlet fever	15
Smallpox	2
Tuberculosis	4
Typhoid fever	6
Whooping cough	11

TEXAS.

Cerebrospinal meningitis	4
Chicken pox	13
Dengue	23
Diphtheria	45
Dysentery (epidemic)	52
Influenza	98
Lethargic encephalitis	4
Malta fever	2
Measles	17
Mumps	26
Ophthalmia neonatorum	2
Paratyphoid fever	19
Pellagra	44
Pneumonia	15
Poliomeylitis	2
Rabies in man	3
Scarlet fever	21
Smallpox	4
Tetanus	5
Trachoma	8
Tuberculosis	39
Typhoid fever	63
Typhus fever	1
Whooping cough	45

VERMONT.

Chicken pox	1
Diphtheria	2
Measles	10
Scarlet fever	2
Smallpox	1
Whooping cough	24

[1] Deaths.

WASHINGTON.	Cases.
Chicken pox	13
Diphtheria	35
Measles	2
Mumps	2
Poliomyelitis:	
Bellingham	2
Chelan County	8
Kittitas County	3
Okanogan County	1
Seattle	4
Skagit County	1
Spokane	1
Tacoma	2
Thurston County	1
Walla Walla County	1
Scarlet fever	28
Smallpox	13
Tuberculosis	46
Typhoid fever	17
Whooping cough	7
WEST VIRGINIA.	
Cerebrospinal meningitis	1
Diphtheria	5
Scarlet fever	4
Smallpox	1
Typhoid fever	13

WISCONSIN.	Cases.
Milwaukee:	
Chicken pox	3
Diphtheria	6
Measles	1
Mumps	3
Pneumonia	1
Poliomyelitis	1
Scarlet fever	12
Smallpox	1
Tuberculosis	21
Typhoid fever	1
Whooping cough	29
Scattering:	
Chicken pox	19
Diphtheria	29
German measles	1
Influenza	9
Measles	11
Mumps	9
Pneumonia	7
Poliomyelitis	1
Scarlet fever	40
Smallpox	14
Tuberculosis	22
Typhoid fever	5
Whooping cough	100

Reports for Week Ended September 6, 1924.

CALIFORNIA.	Cases.
Cerebrospinal meningitis—Siskiyou County	1
Diphtheria	116
Influenza	3
Lethargic encephalitis—San Francisco	1
Measles	16
Poliomyelitis:	
Los Angeles	1
Fresno County	1
Scarlet fever	44
Smallpox:	
Los Angeles	15
Los Angeles County	18
Scattering	22
Typhoid fever	17
DISTRICT OF COLUMBIA	
Chicken pox	5
Diphtheria	5
Scarlet fever	8
Tuberculosis	17

DISTRICT OF COLUMBIA—continued	Cases.
Typhoid fever	2
Whooping cough	7
NEBRASKA.	
Chicken pox	3
Diphtheria	14
Scarlet fever	2
Tetanus	1
Tuberculosis	1
Typhoid fever	1
NORTH DAKOTA.	
Chicken pox	2
Diphtheria	3
Pneumonia	1
Poliomyelitis	8
Scarlet fever	12
Tuberculosis	1
Typhoid fever	1
Whooping cough	10

SUMMARY OF MONTHLY REPORTS FROM STATES.

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

State.	Cerebro-spinal menin-gitis.	Diph-theria.	Infla-enza.	Ma-laria.	Mea-sles.	Pella-gra.	Polio-my-elitis.	Scarlet fever.	Small-pox.	Ty-phoid fever.
July, 1924.										
Colorado		86			49			36	10	20
August, 1924.										
Arizona		9			6		1	8	2	7
Connecticut	8	91	3	9	38		36	81	1	44
Delaware		3	9	1	2			4		7
Georgia	2	60	4	204	26	9		20	21	164
Massachusetts	8	376	2	9	149	1	37	227		65
Vermont		6			25		2	16		
Wyoming		5	1		2			11		6

GENERAL CURRENT SUMMARY AND WEEKLY REPORTS FROM CITIES.

Diphtheria.—For the week ended August 30, 1924, 35 States reported 1,063 cases of diphtheria. For the week ended September 1, 1923, the same States reported 1,284 cases of this disease. One hundred and one cities, situated in all parts of the country and having an aggregate population of about 28,000,000, reported 477 cases of diphtheria for the week ended August 30, 1924. Last year, for the corresponding week, they reported 634 cases. The estimated expectancy for these cities was 637 cases of diphtheria. The estimated expectancy was based on the experience of the last nine years, excluding epidemics.

Measles.—Thirty States reported 269 cases of measles for the week ended August 30, 1924, and 1,037 cases of this disease for the week ended September 1, 1923. One hundred and one cities reported 120 cases of measles for the week this year and 333 cases last year.

Scarlet fever.—Scarlet fever was reported for the week as follows: Thirty-five States—this year 659 cases; last year 806 cases. One hundred and one cities—this year 307, last year 309 cases; estimated expectancy, 282 cases.

Smallpox.—For the week ended August 30, 1924, 35 States reported 205 cases of smallpox. Last year, for the corresponding week, they reported 145 cases. One hundred and one cities reported smallpox for the week as follows: 1924, 88 cases; 1923, 40 cases; estimated expectancy, 30 cases. These cities reported 4 deaths from smallpox for the week.

Typhoid fever.—Eight hundred and forty-eight cases of typhoid fever were reported for the week ended August 30, 1924, by 34 States. For the corresponding week of 1923 the same States reported 904

cases. One hundred and one cities reported 214 cases of typhoid fever for the week this year and 264 cases for the week last year. The estimated expectancy for these cities was 247 cases.

Influenza and pneumonia.—Deaths from influenza and pneumonia (combined) were reported for the week by 101 cities as follows: 1924, 326 deaths; 1923, 302 deaths.

City reports for week ended August 30, 1924.

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

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

Division, State, and city.	Chicken pox, cases reported.	Diphtheria.		Influenza.		Measles, cases reported.	Mumps, cases reported.	Pneumonia, deaths reported.	Scarlet fever.	
		Cases, estimated expectancy.	Cases reported.	Cases reported.	Deaths reported.				Cases, estimated expectancy.	Cases reported.
NEW ENGLAND.										
Maine:										
Lewiston	0	1	0	0	0	0	0	0	1	0
Portland	0	1	0	0	0	0	0	1	1	0
New Hampshire:										
Concord	0	1	0	0	0	0	0	0	0	0
Vermont:										
Barre	0	0	0	0	0	0	0	0	1	0
Burlington	0	0	0	0	0	0	0	0	1	0
Massachusetts:										
Boston	0	33	26	0	0	16	2	13	12	17
Fall River	0	2	1	0	0	1	0	0	1	2
Springfield	0	2	0	0	0	3	3	0	1	1
Worcester	2	3	0	0	0	1	2	0	2	0
Rhode Island:										
Pawtucket	0	1	0	0	0	0	0	0	0	0
Providence	0	6	3	0	0	0	0	3	2	4
Connecticut:										
Bridgeport	0	4	2	1	1	0	0	0	1	3
Hartford	0	4	1	0	0	2	1	0	1	0
New Haven	0	3	2	0	0	3	1	2	2	1
MIDDLE ATLANTIC.										
New York:										
Buffalo	0	13	2	0	0	8	0	9	6	1
New York	13	92	102	1	2	17	5	84	24	32
Rochester	----	5	0	0	0	2	----	3	2	5
Syracuse	0	5	2	0	0	1	1	0	4	1
New Jersey:										
Camden	1	0	2	0	0	0	0	1	0	0
Newark	0	8	11	0	0	8	0	0	3	6
Trenton	1	4	4	0	0	0	0	2	1	0
Pennsylvania:										
Philadelphia	3	32	33	----	2	4	11	16	16	10
Pittsburgh	1	20	10	----	0	1	7	21	7	14
Reading	0	2	1	0	0	0	1	0	0	0
Scranton	1	2	2	0	0	1	0	3	0	0
EAST NORTH CENTRAL.										
Ohio:										
Cincinnati	2	9	0	----	1	0	0	2	4	5
Cleveland	----	23	----	----	----	----	----	----	10	----
Columbus	0	3	1	----	1	1	1	1	3	4
Toledo	0	6	8	0	0	5	0	0	5	1

City reports for week ended August 30, 1924—Continued.

Division, State, and city.	Chicken pox, cases reported.	Diphtheria. Cases, estimated expectancy.	Diphtheria. Cases reported.	Influenza. Cases reported.	Influenza. Deaths reported.	Measles, cases reported.	Mumps, cases reported.	Pneumonia, deaths reported.	Scarlet fever. Cases, estimated expectancy.	Scarlet fever. Cases reported.
EAST NORTH CENTRAL—contd.										
Indiana:										
Fort Wayne	-------	2	1	0	0	0	-------	1	0	2
Indianapolis	-------	10	3	0	0	0	-------	4	3	0
South Bend	0	2	4	0	0	0	0	0	2	0
Terre Haute	0	1	1	0	0	0	0	0	0	2
Illinois:										
Chicago	8	71	27	-------	1	10	6	23	36	16
Cicero	0	3	1	0	0	0	0	0	0	1
Peoria	0	1	0	0	0	0	0	1	2	0
Springfield	-------	1	0	0	0	1	-------	2	1	0
Michigan:										
Detroit	7	39	8	2	0	2	6	14	23	20
Flint	1	6	0	0	0	1	1	0	2	7
Grand Rapids	0	3	2	0	0	0	0	2	2	7
Wisconsin:										
Madison	1	0	2	2	-------	0	1	-------	1	0
Milwaukee	8	12	7	0	0	2	2	-------	11	4
Racine	0	1	0	0	0	0	0	1	1	0
Superior	0	0	0	0	0	0	0	0	1	1
WEST NORTH CENTRAL.										
Minnesota:										
Duluth	1	2	0	0	0	0	0	1	3	5
Minneapolis	10	14	8	0	0	0	2	2	7	14
St. Paul	-------	13	10	0	0	0	-------	4	3	5
Iowa:										
Sioux City	1	1	0	0	-------	0	0	-------	1	0
Waterloo	0	1	0	0	-------	0	0	-------	1	0
Missouri:										
Kansas City	0	5	2	0	0	0	0	5	2	0
St. Joseph	0	1	0	0	0	0	0	0	1	0
St. Louis	3	26	23	0	0	8	4	-------	7	32
North Dakota:										
Fargo	0	0	0	0	0	0	0	0	1	0
Grand Forks	0	1	0	0	-------	0	0	-------	1	0
South Dakota:										
Sioux Falls	0	0	1	0	0	0	0	0	0	0
Nebraska:										
Lincoln	0	0	0	0	0	0	0	0	0	0
Omaha	1	8	5	0	0	1	0	5	2	1
Kansas:										
Topeka	1	1	1	0	0	0	4	0	1	1
Wichita	0	2	0	0	0	0	0	1	1	0
SOUTH ATLANTIC.										
Delaware:										
Wilmington	0	1	3	0	0	0	0	1	1	0
Maryland:										
Baltimore	1	11	16	1	1	6	0	10	7	5
Cumberland	-------	1	0	0	0	0	-------	1	0	1
Frederick	-------	0	2	0	0	0	-------	0	0	0
DistrictofColumbia:										
Washington	2	4	2	0	0	0	0	9	3	7
Virginia:										
Lynchburg	0	1	1	0	0	0	0	1	0	0
Norfolk	0	2	1	0	0	0	1	0	0	1
Richmond	0	6	15	0	0	4	0	2	3	4
Roanoke	0	2	4	0	0	0	0	0	1	1
West Virginia:										
Charleston	0	1	0	0	0	0	0	1	1	1
Huntington	0	1	0	0	-------	0	0	-------	1	1
Wheeling	0	2	1	0	0	0	0	1	2	1
North Carolina:										
Raleigh	-------	1	-------	-------	-------	-------	-------	-------	1	-------
Wilmington	-------	1	2	0	0	0	-------	1	0	0
Winston-Salem	1	1	17	0	0	1	1	1	1	4
South Carolina:										
Charleston	0	1	0	0	0	0	0	1	1	1
Columbia	0	1	1	0	0	0	0	0	0	0
Greenville	0	1	2	0	0	0	0	1	1	0

City reports for week ended August 30, 1924—Continued.

Division, State, and city.	Chicken pox, cases reported	Diphtheria.		Influenza.		Measles, cases reported.	Mumps, cases reported.	Pneumonia, deaths reported.	Scarlet fever.	
		Cases, estimated expectancy.	Cases reported.	Cases reported.	Deaths reported.				Cases, estimated expectancy.	Cases reported
SOUTH ATLANTIC—continued.										
Georgia:										
Atlanta	0	5	0	0	0	0	0	4	4	0
Brunswick	0	0	0	0	0	0	0	0	0	0
Savannah	0	1	0	0	0	0	1	0	1	0
Florida:										
St. Petersburg	C		0	0	1	0	0	0	0	0
Tampa		2	1	0	0	0		0	0	0
EAST SOUTH CENTRAL.										
Kentucky:										
Covington	0	1	0	0	0	0	0	0	0	1
Lexington		1							0	
Louisville	0	6	1	0	0	1	0	1	1	1
Tennessee:										
Memphis	0	6	3	0	0	0	0	3	2	2
Nashville	0	1	2	0	1	0	0	2	2	0
Alabama:										
Birmingham	0	4	2	0	0	0	3	4	3	5
Mobile	0	1	0	0	0	0	0	1	0	0
Montgomery		1							1	
WEST SOUTH CENTRAL.										
Arkansas:										
Fort Smith	0	1	0	0		0	0		1	0
Little Rock	0	1	2	0		0	0		1	0
Louisiana:										
New Orleans	0	8	7	2	1	0	0	4	1	2
Shreveport	0		0	0	0	0	0	0		0
Oklahoma:										
Oklahoma	0	1	0	0	0	0	1	0	1	0
Tulsa	0	1	0	0		0	0		1	0
Texas:										
Dallas	0	4	0	0	0	0	0	3	1	0
Galveston	0	0	1	0	0	0	0	1	0	0
Houston		2	1	0	1	0		1	1	3
San Antonio	0	1	0	0	0	0	0	2	1	0
MOUNTAIN.										
Montana:										
Billings	0	0	0	0	0	0	0	0	0	0
Great Falls	0	1	0	0	0	0	0	1	0	0
Helena	0	0	0	0	0	0	0	1	0	0
Missoula	0	0	0	0	0	0	0	0	0	0
Idaho:										
Boise	0	0	0	0	0	0	0	0	0	0
Colorado:										
Denver	3	8	15	0	0	3	1	9	3	10
Pueblo	0	4	0	0	0	0	0	0	0	5
New Mexico:										
Albuquerque		1	1	0	0	0		0	1	0
Utah:										
Salt Lake City	2	2	1	0	0	1	4	2	2	2
Nevada:										
Reno	0	0	0	0	0	0	0	0	0	0
PACIFIC.										
Washington:										
Seattle	5	3	6	0		0	1		3	7
Spokane	1	1	0	0		0	0		3	0
Tacoma	1	1	2	0		0	2		1	2
Oregon:										
Portland	0	3	14	0	0	3	0	2	2	5
California:										
Los Angeles	4	18	28	2	0	3	1	11	5	6
Sacramento	0	1	5	0	0	0	0	1	1	0
San Francisco	2	15	15	0	0	1	3	5	6	5

City reports for week ended August 30, 1924—Continued.

Division, State, and city.	Population July 1, 1923, estimated.	Smallpox.			Tuberculosis, deaths reported.	Typhoid fever.			Whooping cough, cases reported.	Deaths, all causes.
		Cases, estimated expectancy.	Cases reported.	Deaths reported.		Cases, estimated expectancy.	Cases reported.	Deaths reported.		
NEW ENGLAND.										
Maine:										
Lewiston	33,790	0	0	0	0	0	1	0	0	6
Portland	73,129	0	0	0	0	2	0	0	0	16
New Hampshire:										
Concord	22,408	0	0	0	0	0	0	0	0	5
Vermont:										
Barre	[1] 10,008	0	0	0	0	0	0	0	0	4
Burlington	23,613	0	0	0	0	1	0	0	0	11
Massachusetts:										
Boston	770,400	0	0	0	19	6	2	0	12	200
Fall River	120,912	0	0	0	1	2	0	0	4	24
Springfield	144,227	0	0	0	1	1	0	0	2	25
Worcester	191,927	0	0	0	3	1	0	0	0	52
Rhode Island:										
Pawtucket	68,799	0	0	0	1	1	0	0	0	9
Providence	242,378	0	0	0	3	1	2	0	1	48
Connecticut:										
Bridgeport	[1] 143,555	0	0	0	1	0	0	0	----	11
Hartford	[1] 138,036	0	0	0	3	2	0	0	2	15
New Haven	172,967	0	0	0	1	4	8	0	16	25
MIDDLE ATLANTIC.										
New York:										
Buffalo	536,718	0	0	0	12	3	1	0	18	128
New York	5,927,625	0	0	0	[2] 88	47	31	4	154	1,106
Rochester	317,867	0	1	0	1	1	0	0	----	61
Syracuse	184,511	0	0	0	1	1	0	0	2	38
New Jersey:										
Camden	124,157	0	5	1	0	3	0	0	0	19
Newark	438,699	0	0	0	6	3	0	1	117	92
Trenton	127,390	0	0	0	3	2	0	0	2	40
Pennsylvania:										
Philadelphia	1,922,788	0	0	0	30	17	7	2	96	406
Pittsburgh	613,442	0	5	0	8	4	2	1	11	147
Reading	110,917	0	0	0	1	1	0	0	24	30
Scranton	140,636	0	0	0	2	0	3	1	25	----
EAST NORTH CENTRAL.										
Ohio:										
Cincinnati	406,312	1	0	0	10	3	2	1	4	114
Cleveland	888,519	1	----	----	----	4	----	----	----	----
Columbus	261,082	0	0	0	8	2	4	0	7	78
Toledo	268,338	0	2	1	0	2	4	0	15	41
Indiana:										
Fort Wayne	93,573	0	0	0	3	1	4	0	----	24
Indianapolis	342,718	1	0	0	9	3	1	1	----	106
South Bend	76,709	0	0	0	1	0	0	0	0	5
Terre Haute	68,939	0	0	0	1	0	0	0	0	14
Illinois:										
Chicago	2,886,121	1	3	0	30	7	6	1	132	529
Cicero	55,968	0	0	0	0	0	0	0	0	4
Peoria	79,675	0	0	0	1	1	0	0	0	20
Springfield	61,833	0	0	0	0	1	0	0	----	16
Michigan:										
Detroit	995,668	1	2	1	22	5	0	0	72	244
Flint	117,968	0	2	0	1	2	0	0	0	15
Grand Rapids	145,947	1	0	0	0	1	0	0	4	26
Wisconsin:										
Madison	42,519	0	3	----	----	0	0	----	24	3
Milwaukee	484,595	1	0	0	7	1	0	0	27	70
Racine	64,393	0	0	0	0	0	0	0	0	5
Superior	[1] 39,671	1	1	0	0	0	0	0	0	14

[1] Population Jan. 1, 1920.
[2] Pulmonary only.

City reports for week ended August 30, 1924—Continued.

Division, State, and city.	Population July 1, 1923, estimated.	Smallpox.			Tuberculosis, deaths reported.	Typhoid fever.			Whooping cough, cases reported.	Deaths, all causes.
		Cases, estimated expectancy.	Cases reported.	Deaths reported.		Cases, estimated expectancy.	Cases reported.	Deaths reported.		
WEST NORTH CENTRAL.										
Minnesota:										
Duluth	106,289	0	0	0	0	0	3	0	6	25
Minneapolis	469,125	2	6	0	8	2	0	0	2	70
St. Paul	241,891	1	17	0	6	1	2	0	-----	64
Iowa:										
Sioux City	79,662	0	0	-----	-----	0	1	-----	1	-----
Waterloo	39,667	0	0	-----	-----	0	0	-----	4	-----
Missouri:										
Kansas City	351,819	1	0	0	5	3	3	1	3	82
St. Joseph	78,232	0	0	0	0	0	0	0	2	24
St. Louis	803,853	1	0	0	11	7	17	1	3	189
North Dakota:										
Fargo	24,841	0	0	0	1	0	0	0	0	5
Grand Forks	14,547	0	0	-----	-----	0	0	-----	0	-----
South Dakota:										
Sioux Falls	29,206	0	0	0	0	0	0	0	0	9
Nebraska:										
Lincoln	58,761	0	2	1	1	0	0	0	0	11
Omaha	204,382	1	2	0	4	1	0	0	1	53
Kansas:										
Topeka	52,555	0	0	0	1	1	0	0	4	13
Wichita	79,261	1	0	0	0	2	2	0	7	18
SOUTH ATLANTIC.										
Delaware:										
Wilmington	117,728	0	0	0	0	1	3	2	2	20
Maryland:										
Baltimore	773,580	0	0	0	16	12	4	0	28	174
Cumberland	32,361	0	0	0	0	1	2	0	-----	16
Frederick	11,301	0	0	0	0	1	1	0	-----	0
District of Columbia:										
Washington	[1] 437,571	0	0	0	9	5	4	0	11	107
Virginia:										
Lynchburg	30,277	0	0	0	0	1	1	0	0	9
Norfolk	159,089	0	0	0	2	2	3	0	3	-----
Richmond	181,044	0	0	0	3	2	0	0	-----	43
Roanoke	55,502	0	0	0	0	3	5	0	1	18
West Virginia:										
Charleston	45,597	0	1	0	0	2	4	0	0	20
Huntington	57,918	0	0	-----	-----	1	0	-----	0	-----
Wheeling	[1] 56,208	0	0	0	2	1	1	0	0	15
North Carolina:										
Raleigh	29,171	0	-----	-----	-----	1	-----	-----	-----	-----
Wilmington	35,719	0	0	0	0	1	0	0	-----	13
Winston-Salem	56,230	0	0	0	3	2	0	0	9	12
South Carolina:										
Charleston	71,245	0	0	0	2	2	2	0	0	14
Columbia	39,688	0	1	0	0	1	2	0	1	13
Greenville	25,789	0	0	0	1	0	0	0	3	8
Georgia:										
Atlanta	222,963	1	0	0	7	5	1	1	-----	75
Brunswick	15,937	0	0	0	1	1	0	0	0	5
Savannah	89,448	0	0	0	4	2	1	0	0	32
Florida:										
St. Petersburg	24,403	0	0	0	0	0	0	0	0	6
Tampa	56,050	0	0	0	0	1	0	0	-----	6
EAST SOUTH CENTRAL.										
Kentucky:										
Covington	57,877	0	0	0	0	1	1	0	0	13
Lexington	43,673	0	-----	-----	-----	1	-----	-----	-----	-----
Louisville	257,671	0	4	0	6	6	4	0	-----	61
Tennessee:										
Memphis	170,067	0	0	0	7	2	18	5	0	64
Nashville	121,128	0	1	0	1	6	7	0	1	48
Alabama:										
Birmingham	195,901	0	8	0	4	6	15	0	2	49
Mobile	63,858	0	0	0	1	1	3	0	0	23
Montgomery	45,383	0	-----	-----	-----	1	-----	-----	-----	-----

[1] Population Jan. 1, 1920.

City reports for week ended August 30, 1924—Continued.

Division, State, and city.	Population, July 1, 1923, estimated.	Smallpox.			Tuberculosis, deaths reported.	Typhoid fever.			Whooping cough, cases reported.	Deaths, all causes.
		Cases, estimated expectancy.	Cases reported.	Deaths reported.		Cases, estimated expectancy.	Cases reported.	Deaths reported.		
WEST SOUTH CENTRAL.										
Arkansas:										
Fort Smith	30,635	0	0	----	----	1	0	----	2	----
Little Rock	70,916	0	0	0	4	2	6	0	0	----
Louisiana:										
New Orleans	404,575	1	0	0	10	4	5	2	3	130
Shreveport	54,590	----	0	0	1	----	5	0	0	17
Oklahoma:										
Oklahoma	101,150	0	0	0	1	1	4	0	0	17
Tulsa	102,018	0	0	----	----	3	0	----	0	----
Texas:										
Dallas	177,274	0	1	0	7	3	9	3	2	39
Galveston	46,877	0	0	0	2	0	0	1	0	23
Houston	154,970	0	0	0	1	1	0	0	----	37
San Antonio	184,727	0	0	0	6	0	0	0	0	----
MOUNTAIN.										
Montana:										
Billings	16,927	1	1	0	0	0	1	0	0	10
Great Falls	27,787	1	0	0	0	1	0	0	0	8
Helena	[1] 12,037	0	0	0	0	0	0	0	0	2
Missoula	[1] 12,668	1	0	0	0	0	1	0	0	8
Idaho:										
Boise	22,806	1	1	0	0	0	0	0	0	11
Colorado:										
Denver	272,031	2	0	0	13	4	0	0	14	80
Pueblo	43,519	0	0	0	2	1	0	0	0	13
New Mexico:										
Albuquerque	16,648	0	0	0	6	1	1	0	----	13
Utah:										
Salt Lake City	126,241	2	0	0	0	1	5	2	3	33
Nevada:										
Reno	12,429	0	0	0	0	1	0	0	0	1
PACIFIC.										
Washington:										
Seattle	[1] 315,685	1	1	----	----	2	2	----	5	----
Spokane	104,573	1	0	----	----	1	0	----	7	----
Tacoma	101,731	0	2	----	----	1	0	----	0	----
Oregon:										
Portland	273,621	3	6	0	1	1	0	0	0	----
California:										
Los Angeles	666,853	1	15	0	16	4	1	0	27	169
Sacramento	69,950	1	4	0	2	1	0	0	0	25
San Francisco	539,038	1	0	0	8	2	0	0	0	124

[1] Population Jan. 1, 1920.

City reports for week ended August 30, 1924—Continued.

Division, State, and city.	Cerebrospinal meningitis.		Lethargic encephalitis.		Pellagra.		Poliomyelitis (infantile paralysis).		
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases, est. expectancy.	Cases.	Deaths.
NEW ENGLAND.									
Maine:									
Lewiston	0	0	0	0	0	0	0	1	0
Massachusetts:									
Boston	2	1	1	0	0	0	1	5	0
Fall River	0	0	0	0	0	0	0	1	0
Rhode Island:									
Providence	0	0	0	0	0	0	0	1	0
Connecticut:									
Bridgeport	0	0	1	0	0	0	0	0	0
Hartford	0	0	1	0	0	0	0	3	0
MIDDLE ATLANTIC.									
New York:									
Buffalo	8	0	0	0	0	0	0	0	0
New York	6	3	8	1	0	1	8	15	1
Syracuse	0	0	0	0	0	0	0	10	1
New Jersey:									
Newark	0	0	1	0	0	0	1	0	0
Pennsylvania:									
Philadelphia	0	0	2	0	0	0	1	1	0
EAST NORTH CENTRAL.									
Ohio:									
Cincinnati	0	0	0	2	0	0	0	0	0
Columbus	0	0	0	1	0	0	0	2	0
Indiana:									
Fort Wayne	0	0	0	0	0	0	0	2	1
Illinois:									
Chicago	0	0	0	0	0	0	5	3	0
Michigan:									
Detroit	0	0	0	0	0	0	1	38	4
Grand Rapids	0	0	0	0	0	0	0	4	0
WEST NORTH CENTRAL.									
Minnesota:									
St. Paul	0	1	0	0	0	0	1	0	0
Missouri:									
St. Louis	0	0	0	0	0	0	1	2	0
North Dakota:									
Fargo	0	0	0	1	0	0	0	0	0
Grand Forks	0	0	0	0	0	0	0	1	0
SOUTH ATLANTIC.									
Maryland:									
Baltimore	2	0	1	1	0	0	2	8	0
Virginia:									
Norfolk	1	0	0	0	0	0	0	0	0
North Carolina:									
Winston-Salem	0	0	0	0	1	0	0	1	0
Georgia:									
Atlanta	0	0	0	0	0	2	0	0	0
EAST SOUTH CENTRAL.									
Alabama:									
Birmingham	0	0	0	0	1	1	0	0	0
WEST SOUTH CENTRAL.									
Louisiana:									
Shreveport	0	0	0	0	0	1	-------	0	0
Oklahoma:									
Oklahoma	0	0	0	1	0	0	0	0	0
MOUNTAIN.									
Montana:									
Billings	0	0	0	0	0	0	0	0	1
Missoula	0	0	0	0	0	0	0	14	1
Colorado:									
Denver	0	0	0	0	0	0	0	1	0
PACIFIC.									
Washington:									
Seattle	0	-------	0	-------	0	-------	0	10	-------
California:									
Los Angeles	0	0	0	0	0	0	0	2	0
San Francisco	0	0	1	0	0	0	1	0	0

The following table gives a summary of the reports from 105 cities for the 10-week period ended August 30, 1924. The cities included in this table are those whose reports have been published for all 10 weeks in the Public Health Reports. Eight of these cities did not report deaths. The aggregate population of the cities reporting cases was estimated at nearly 29,000,000 on July 1, 1923, which is the latest date for which estimates are available. The cities reporting deaths had more than 28,000,000 population on that date. The number of cities included in each group and the aggregate population are shown in a separate table below.

Summary of weekly reports from cities, June 22 to August 30, 1924.

DIPHTHERIA CASES.

	1924, week ended—									
	June 28.	July 5.	July 12.	July 19.	July 26.	Aug. 2.	Aug. 9.	Aug. 16.	Aug. 23.	Aug. 30.
Total	891	666	693	652	560	477	538	456	494	480
New England	78	64	55	71	59	47	60	47	48	35
Middle Atlantic	387	296	301	274	222	188	197	149	189	167
East North Central	136	101	135	120	99	83	103	91	88	[1] 69
West North Central	36	50	52	36	37	40	43	38	49	50
South Atlantic	20	17	19	26	21	28	22	40	39	[2] 68
East South Central	8	1	3	2	6	3	6	7	9	[3] 8
West South Central	15	19	5	5	15	12	7	13	15	11
Mountain	30	19	36	25	14	5	10	22	14	16
Pacific	181	99	87	93	87	71	90	49	43	56

MEASLES CASES.

Total	1,857	1,186	987	676	528	406	253	178	136	121
New England	120	90	66	52	59	41	11	23	23	26
Middle Atlantic	774	535	422	283	204	160	97	65	46	41
East North Central	565	288	295	202	155	126	75	51	37	[1] 25
West North Central	63	46	29	35	22	16	11	7	4	9
South Atlantic	187	141	91	55	43	34	36	16	10	[2] 11
East South Central	19	15	15	13	6	3	2	4	5	[3] 1
West South Central	5	1	7	3	5	3	0	1	1	0
Mountain	35	22	11	7	6	7	3	1	1	4
Pacific	89	48	51	26	28	16	18	10	9	4

SCARLET FEVER CASES.

Total	713	563	561	441	340	369	360	248	291	307
New England	92	59	50	39	38	40	36	24	28	29
Middle Atlantic	226	186	144	114	90	73	85	49	55	69
East North Central	161	132	168	102	90	126	108	57	74	[1] 74
West North Central	102	68	100	93	65	65	61	61	75	58
South Atlantic	43	30	47	33	15	20	21	12	21	[2] 26
East South Central	1	1	7	7	7	2	3	10	13	[3] 9
West South Central	7	11	8	5	9	11	5	9	5	5
Mountain	12	16	4	14	5	7	12	5	4	17
Pacific	69	60	33	34	21	25	29	21	16	20

SMALLPOX CASES.

Total	239	159	169	158	108	116	106	93	71	88
New England	0	0	1	0	0	0	0	0	0	0
Middle Atlantic	16	19	16	17	9	9	7	8	3	11
East North Central	61	44	33	44	36	28	23	16	20	[1] 12
West North Central	41	23	47	33	13	18	15	28	5	25
South Atlantic	12	9	3	5	3	3	4	6	4	[2] 2
East South Central	36	23	21	18	13	16	8	13	14	[3] 13
West South Central	7	1	1	0	0	2	0	0	1	1
Mountain	9	5	6	4	2	2	1	1	2	2
Pacific	57	35	41	37	32	38	48	21	22	22

[1] Figures for Cleveland, Ohio, estimated. Reports not received at time of going to press.
[2] Figures for Raleigh, N. C., estimated.
[3] Figures for Montgomery, Ala., estimated.

Summary of weekly reports from cities, June 22, to August 30, 1924—Continued.

TYPHOID FEVER CASES.

	1924, week ended—									
	June 28.	July 5.	July 12.	July 19.	July 26.	Aug. 2.	Aug. 9.	Aug. 16.	Aug. 23.	Aug. 30.
Total	91	128	142	197	191	191	250	232	238	222
New England	4	2	6	7	6	4	6	15	8	12
Middle Atlantic	41	46	34	50	59	59	63	63	65	41
East North Central	11	9	20	20	17	20	30	29	22	[1] 22
West North Central	5	15	12	10	11	9	22	22	17	28
South Atlantic	10	23	25	36	25	31	44	37	35	[2] 34
East South Central	3	8	10	31	29	36	40	24	49	[3] 50
West South Central	4	8	21	26	22	17	19	26	29	25
Mountain	3	6	5	4	7	4	5	9	0	7
Pacific	10	11	9	13	15	11	21	7	13	3

INFLUENZA DEATHS.

Total	13	9	11	5	3	13	8	8	7	13
New England	1	1	0	0	1	2	0	0	0	1
Middle Atlantic	3	2	5	1	0	6	3	4	1	4
East North Central	3	2	1	1	0	0	2	2	2	[1] 3
West North Central	0	0	0	1	1	2	0	0	0	0
South Atlantic	4	3	2	1	1	1	2	0	3	[2] 2
East South Central	2	1	3	0	0	1	0	0	0	[3] 1
West South Central	0	0	0	0	0	0	1	0	1	2
Mountain	0	0	0	0	0	0	0	0	0	0
Pacific	0	0	0	1	0	1	0	2	0	0

PNEUMONIA DEATHS.

Total	432	358	318	307	304	292	269	271	251	314
New England	22	19	16	14	16	17	14	14	12	19
Middle Atlantic	200	167	141	127	126	131	121	115	102	136
East North Central	91	62	55	53	58	50	51	48	48	[1] 55
West North Central	11	15	22	17	13	14	9	17	13	18
South Atlantic	50	39	39	37	35	36	29	32	38	[2] 34
East South Central	15	14	9	12	15	12	10	10	5	[3] 11
West South Central	12	16	16	22	20	11	14	12	10	11
Mountain	12	8	10	4	7	4	8	7	10	13
Pacific	19	18	10	21	14	17	13	16	13	17

[1] Figures for Cleveland, Ohio, estimated. Reports not received at time of going to press.
[2] Figures for Raleigh, N. C., estimated.
[3] Figures for Montgomery, Ala., estimated.

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

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

FOREIGN AND INSULAR.

CANADA.

Communicable Diseases—Ontario—August, 1924. (Comparative.)

Communicable diseases have been notified in the Province of Ontario, Canada, for the month of August, 1924, as follows:

Disease.	August, 1924.		August, 1923.	
	Cases.	Deaths.	Cases.	Deaths.
Cerebrospinal meningitis	9	5	----------	8
Chancroid	1	----------	7	----------
Chicken pox	175	----------	(1)	----------
Diphtheria	269	16	194	12
German measles	15	----------	(1)	----------
Gonorrhea	175	----------	212	----------
Influenza	18	3	----------	----------
Lethargic encephalitis	1	1	(1)	----------
Measles	879	3	256	3
Mumps	180	----------	(1)	----------
Paratyphoid fever	2	----------	(1)	----------
Pneumonia	----------	45	----------	83
Poliomyelitis	3	----------	----------	----------
Scarlet fever	337	7	215	6
Septic sore throat	3	----------	(1)	----------
Smallpox	6	----------	9	----------
Syphilis	121	----------	161	----------
Tuberculosis	[2] 156	74	213	135
Typhoid fever	120	8	114	14
Whooping cough	300	4	197	13

Population, 2,182,947.

[1] Not reported in 1923.

[2] Only 50 per cent stated to be reported.

Goiter.

During the period under report 61 cases of goiter were notified in the Province of Ontario, Canada. The disease was stated not to have been notifiable in the year 1923.

CHILE.

Typhus Fever—Talcahuano—Valparaiso.

Typhus fever has been reported in Chile as follows: Talcahuano, week ended August 2, 1924, 3 deaths, with 11 cases reported present; Valparaiso, three weeks ended August 9, 1924, 11 deaths.

CUBA.

Communicable Diseases—Habana.

Communicable diseases have been notified at Habana, Cuba, as follows:

Disease.	Aug. 21-31, 1924.		Remaining under treatment Aug. 31, 1924.	Disease.	Aug. 21-31, 1924.		Remaining under treatment Aug. 31, 1924.
	New cases.	Deaths.			New cases.	Deaths.	
Chicken pox	1	----------	----------	Measles	2	----------	1
Diphtheria	4	----------	3	Paratyphoid fever	----------	----------	2
Leprosy	----------	----------	15	Scarlet fever	1	----------	2
Malaria	10	----------	[1] 35	Typhoid fever	40	10	[2] 170

[1] From the interior, 15.

[2] From the interior, 38.

Typhoid Fever—Summary—June–August, 1924.

Occurrence of typhoid fever at Habana during the period June 1 to August 31, 1924, has been stated as follows: June 1–30, 1924—cases, 198; deaths, 24. July 1–31, 1924—cases, 393; deaths, 76. August 1–31, 1924—cases, 157; deaths, 37.

Paratyphoid Fever.

During the period under report, paratyphoid fever was reported as follows: June, 1924—cases, 11; deaths, 1. July, 1924—cases, 8. August, 1924—cases, 5.

CZECHOSLOVAKIA.

Communicable Diseases—April–June, 1924.

During the three-month period April to June, 1924, inclusive, communicable diseases were notified in Czechoslovakia as follows:

Disease.	Cases.	Deaths.	Provinces reporting greatest number of cases.
Anthrax	13	3	Russinia: Cases, 8; deaths, 3.
Cerebrospinal meningitis	69	21	Slovakia: Cases, 33; deaths, 6.
Diphtheria	853	51	Bohemia: Cases, 425; deaths, 29.
Dysentery	94	6	Bohemia: Cases, 32; deaths, 4.
Malaria	46	1	Russinia: Cases, 34.
Paratyphoid fever A	9	1	Bohemia.
Paratyphoid fever B	61	1	Moravia: Cases, 50.
Scarlet fever	1,678	84	Bohemia: Cases, 611; deaths, 25.
Smallpox	7	2	Bohemia: Cases, 6; deaths, 2.
Trachoma	804	----------	Slovakia: Cases, 348; deaths, 26.
Typhoid fever	1,174	95	Slovakia: Cases, 493; deaths, 35.
Typhus fever	6	----------	Slovakia: Cases, 4.

Rabies.

During the period under report, seven deaths from rabies were notified in Czechoslovakia, of which four occurred in the Province of Bohemia.

ECUADOR.

Plague—Guayaquil—August 1–15, 1924.

During the period August 1 to 15, 1924, a case of plague was reported at Guayaquil, Ecuador.

Plague-Infected Rats.

During the period under report, 7,592 rats were reported taken at Guayaquil, of which 33 were found plague infected.

EGYPT.

Status of Plague.

During the week ended August 5, 1924, four cases of plague were reported in Egypt. Of these, one case occurred at Suez and the remaining three cases were distributed in three districts. From January 1 to August 5, 1924, 344 cases were reported as compared with 1,286 cases during the corresponding period of the year 1923.

ESTHONIA.

Communicable Diseases—June, 1924.

During the month of June, 1924, communicable diseases were notified in the Republic of Esthonia, as follows:

Disease.	Cases.	Disease.	Cases.
Diphtheria	27	Tuberculosis	132
Measles	9	Typhoid fever	37
Paratyphoid fever	8	Typhus fever	5
Scarlet fever	33		

Population, census, 1,107,059.

FINLAND.

Communicable Diseases—July 16–31, 1924.

During the period July 16–31, 1924, communicable diseases were notified in Finland as follows:

Disease.	Cases.	Disease.	Cases.
Diphtheria	28	Poliomyelitis	3
Dysentery	7	Scarlet fever	44
Paratyphoid fever	28	Typhoid fever	24

Population, estimated, 3,402,593.

GREAT BRITAIN.

Typhus Fever—St. Helens.

Information received under date of August 19, 1924, shows the occurrence at St. Helens, England, of two cases of typhus fever and one suspect case during the period July 10 to August 7, 1924. The cases occurred in the same household. St. Helens is situated in the vicinity of Liverpool, on the Mersey River, and is a railway town.

JAPAN.

Epidemic Cerebrospinal Meningitis—Typhoid Fever.

Under date of September 2, 1924, epidemic cerebrospinal meningitis, with a high death rate, was said to be spreading in the rural districts of Japan.

The death rate from typhoid fever in Tokyo, Japan, was stated to have been high since the earthquake last year.[1]

[1] Public Health Reports, Sept. 5, 1924, p. 2335.

LATVIA.

Communicable Diseases—June, 1924.

During the month of June, 1924, communicable diseases were notified in the Republic of Latvia as follows:

Disease.	Cases.	Disease.	Cases.
Anthrax	1	Measles	147
Cerebrospinal meningitis	3	Mumps	35
Diphtheria	45	Scarlet fever	62
Dysentery	10	Smallpox	1
Influenza	1	Typhoid fever	140
Lethargic encephalitis	1	Typhus fever	26
Malaria	1	Whooping cough	62

Population, estimated, 1,900,000.

Riga—City and Province.

During the same period communicable diseases were notified in the city and Province of Riga, as follows:

Disease.	Cases.		Disease.	Cases.	
	Riga city.	Riga province.		Riga city.	Riga province.
Anthrax	1		Mumps	2	
Diphtheria	14		Scarlet fever	25	
Dysentery	3		Typhoid fever	49	
Malaria	1		Typhus fever	1	6
Measles	57	13	Whooping cough	9	5

Population, Riga City, 315,000.

MADAGASCAR.

Further Relative to Plague—Diego Suarez—Tamatave.

Information received under date of July 17, 1924, shows confirmation of reported plague at the ports of Diego Suarez[1] and Tamatave. On June 22, 1924, one case of plague was reported at Diego Suarez, followed by 13 cases with 8 deaths reported to July 10, 1924. At Tamatave the first case was reported June 6, 1924, and was followed during the month by the occurrence of four cases with four deaths.

Plague—Moramanga—June, 1924.

During the month of June, 1924, a fatal case of plague was reported at Moramanga, a locality in the central-east section of Madagascar.

MALTA.

Communicable Diseases—August 1–15, 1924.

During the period August 1 to 15, 1924, communicable diseases were notified in the island of Malta, as follows:

[1] Public Health Reports, Sept. 5, 1924, p. 1336.

Disease.	Cases.	Disease.	Cases.
Broncho-pneumonia	1	Trachoma	5
Lethargic encephalitis	6	Tuberculosis	11
Measles	6	Typhoid fever	14
Pneumonia	2	Undulant fever	66

Population, estimated, 216,702.

POLAND.

Communicable Diseases—June 8–21, 1924.

During the period June 8 to 21, 1924, communicable diseases were reported in Poland as follows:

JUNE 8–14, 1924.

Disease.	Cases.	Deaths.	Districts showing greatest number of deaths.
Cerebrospinal meningitis	7	12	Warsaw.
Diphtheria	60	2	Lwow.
Dysentery	23	5	Krakow.
Malaria	88		
Measles	347	1	Stanislawow.
Relapsing fever	2		
Scarlet fever	196	16	Krakow.
Smallpox	26	1	Do.
Typhoid fever	169	5	Silesia.
Typhus fever	115	6	Krakow.
Whooping cough	171	1	Warsaw.

JUNE 15–21, 1924.

Cerebrospinal meningitis	3	5	Posen.
Diphtheria	63	5	Lublin.
Dysentery	50	11	Krakow.
Malaria	59		
Measles	279	5	Lwow.
Relapsing fever	10		
Scarlet fever	157	10	Do.
Smallpox	4	2	Krakow.
Typhoid fever	163	16	Posen.
Typhus fever	85	6	Polesia.
Whooping cough	108	4	Lwow.

Rabies.

During the period under report, two deaths from rabies were reported in Poland, both occurring in the district of Warsaw.

SOUTH NIGERIA.

Plague—Lagos.

Plague was reported present at Lagos, Southern Nigeria, West Africa, September 8, 1924.

UNION OF SOUTH AFRICA.

Plague—Orange Free State.

During the week ended July 19, 1924, two cases of plague were reported in the Orange Free State, Union of South Africa. The cases occurred in natives on two farms in Smithfield district.

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

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

Reports Received During Week Ended September 19, 1924.[1]

CHOLERA.

Disease.	Date.	Cases.	Deaths.	Remarks.
India				July 6–12, 1924: Cases, 5,549; deaths, 3,477.
Bombay	July 13–26	3	2	
Madras	Aug. 3–9	3	4	
Rangoon	July 20–26	4	4	
Indo-China:				
City—				
Saigon	June 29–July 19	5	4	
Persia:				
Bushire	June 1–30	1	1	
Siam:				
Bangkok	July 20–26	1	1	

PLAGUE.

China:				
Amoy	July 20–Aug. 2		2	
Ecuador:				
Guayaquil	Aug. 1–15	1		Rats taken, 7,592; found infected, 33.
Egypt				July 30–Aug. 5, 1924: Cases, 4. Total from Jan. 1–Aug. 5, 1924: Cases, 344. (Corresponding period, 1923: Cases, 1,286.)
City—				
Suez	July 30–Aug. 5	1		
India				July 6–12, 1924: Cases, 276; deaths, 331.
Bombay	July 12–19	1	1	
Rangoon	July 19–26	18	16	
Indo-China:				
City—				
Saigon	July 20–26	1	1	Including 100 square kilometers in the surrounding country.
Iraq:				
Bagdad	June 22–28	4	2	
Do	June 29–July 12	6	4	
Madagascar:				
Diego Suarez	June 22–July 10	14	8	Seaport.
Moramanga	June 1–30	1	1	Interior.
Tamatave	June 6–30	5	4	
South Nigeria (West Africa):				
Lagos	Sept. 8			Present.
Syria:				
Beirut	July 10–31	4		
Union of South Africa:				
Orange Free State—				
Smithfield district	July 13–19	2		In natives on two farms.

SMALLPOX.

Arabia:				
Aden	July 20–26		1	
Brazil:				
Porto Alegre	July 27–Aug. 2		1	
British South Africa:				
Northern Rhodesia	July 8–21	25		
Canada:				
British Columbia—				
Vancouver	Aug. 10–16	12		
China:				
Amoy	July 27–Aug. 2			Present.
Chungking	do			Do.
Colombia:				
Barranquilla	Aug. 3–9		1	
Czechoslovakia				Apr. 1–June 30, 1924: Cases 7; deaths, 2.
State—				
Bohemia	Apr. 1–June 30	6	2	
Russinia	do	1		

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

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

Reports Received During Week Ended September 19, 1924—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Egypt:				
Cairo	May 21-27	20	7	
Hungary:				
Budapest	July 20-Aug. 2	11		
India				July 6-12, 1924: Cases, 1,427; deaths, 442.
Bombay	July 13-26	49	22	
Karachi	Aug. 3-9	1	1	
Madras	do	17	7	
Indo-China:				
City—				
Saigon	June 29-July 26	33	11	
Java:				
East Java—				
Soerabaya	June 29-July 12	90	25	
Latvia				June 1-30, 1924: Cases, 1
Mexico:				
Tampico	Aug. 11-20	1	1	
Persia:				
Bushire	June 1-30	2		
Poland				June 8-21, 1924: Cases, 30; deaths, 3.
Portugal:				
Lisbon	July 27-Aug. 26	10		
Oporto	Aug. 9-23	7	5	
Spain:				
Barcelona	July 31-Aug. 6		1	
Cadiz	June 1-30		5	
Malaga	Aug. 17-23		3	
Vigo	do		1	
Union of South Africa:				
East London	July 27-Aug. 2	1		
Yugoslavia:				
Belgrade	July 28-Aug. 3	1		

TYPHUS FEVER.

Algeria:				
Algiers	July 1-31	1		
Chile:				
Talcahuano	July 27-Aug. 2		3	Cases reported present, 11.
Valparaiso	July 19-Aug. 9		11	
Czechoslovakia				Apr. 1-June 30, 1924: Cases, 6.
State—				
Slovakia	Apr. 1-June 30	4		
Egypt:				
Alexandria	July 27-Aug. 5	1		
Port Said	do	1		
Esthonia				June 1-30, 1924: Cases, 5
Great Britain:				
St. Helens	Aug. 7	2		One suspect case, July 10, 1924. Locality, vicinity of Liverpool
Latvia				June 1-30, 1924: Cases, 26.
City—				
Riga	June 1-30	1		
Palestine:				
Jerusalem	July 29-Aug. 4	2		
Khulde	Aug. 17	1		
Poland				June 8-21, 1924: Cases, 200; deaths, 12.
Syria:				
Damascus	July 14-20	1		
Turkey:				
Constantinople	Aug. 3-9	1		
Union of South Africa:				
Natal—				
Durban	June 22-28	1		
Transvaal—				
Johannesburg	July 20-26	1		

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

Reports Received from June 28 to September 12, 1924.[1]

CHOLERA.

Place.	Date.	Cases.	Deaths.	Remarks.
India				Apr. 20–June 28, 1924: Cases, 81,035; deaths, 56,740.
Do				June 29–July 5, 1924: Cases, 7,826; deaths, 4,272.
Bombay	May 4–10	1		
Do	June 29–July 12	2	1	
Calcutta	May 11–June 28	293	259	
Do	June 29–July 26	80	71	
Madras	June 1–21	7	6	
Do	June 29–Aug. 2	12	6	
Rangoon	May 11–June 28	98	76	
Do	June 29–July 19	16	15	
Indo-China				Jan. 1–Mar. 31, 1924: Cases, 27; deaths, 13.
Saigon	Apr. 27–June 28	6	4	Including 100 square kilometers of surrounding country.
Philippine Islands				June 15–28, 1924: 33 cases, 22 deaths, including suspects. June 29–July 5, 1924: 5 cases, 4 deaths.
Manila	June 22–28	1		Suspect. Occurring in a non-resident.
Do	July 6–12	1	1	
Province—				
Batangas	July 1	2	2	
Bulacan	June 21	1	1	
Do	June 28–July 4	1		
Cagayan	Mar. 30–Apr. 5	1	1	
Laguna	May 18–24	1	1	
Rizal	July 3	1	1	
Siam:				
Bangkok	May 4–June 28	21	18	
Do	June 29–July 5	2		
Straits Settlements:				
Penang	June 1–7	1	1	
Singapore	June 15–28	9	6	
Do	June 29–July 5	2	1	
On vessel:				
S. S. Argalia		1		At Bassein, Lower Burma, India. Case in European member of crew. Case removed to hospital. Vessel left May 16, 1924, arrived June 8 at Durban, South Africa; left Durban June 10 for Trinidad and Cuba.

PLAGUE.

Algeria:				
Mostaganem	July 21–28	4		Seaport.
Argentina:				
Chaco Territory				April, 1924: Cases reported.
British East Africa:				
Kenya—				
Tanganyika Territory	Feb. 24–June 7	1	2	
Canary Islands:				
Teneriffe—				
La Laguna	June 20	1		
Ceylon:				
Colombo	May 11–June 28	11	7	10 plague rodents.
Do	June 29–July 26	5	4	
Chile:				
Antofagasta	June 1–16	4		
China:				
Amoy	June 15–28		4	
Do	June 29–July 19		10	
Foochow	May 4–June 21		25	Cases not reported.
Ecuador:				
Eloy Alfaro	May 16–31	1		
Guayaquil	May 16–June 30	4	1	Rats taken, 23,717; found infected, 107.
Do	July 1–31	1		Rats taken, 17,437; found plague-infected, 31.
Posorja	July 1–15	1		
Puna	July 16–31	1		

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

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

Reports Received from June 28 to September 12, 1924—Continued.

PLAGUE—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Egypt				June 11-30, 1924: Cases, 36. July 2-15, 1924: Cases, 8. Total, Jan. 1-July 15, 1924—cases, 328 (corresponding period, preceding year—cases, 1,190).
City—				
Alexandria	Apr. 2	1	1	
Port Said	Apr. 24-May 31	2	1	
Suez	Jan. 2-June 26	11	5	
Do	June 27-July 5	2		
Province—				
Assiout	Apr. 1-June 18	40	31	
Beni-Suef	June 21	3	3	
Charkieh	Jan. 31	1	1	
Fayoum	Feb. 18-June 19	105	32	
Gharbia	Apr. 21-June 17	2	1	
Ghirga	Jan. 17-May 13	10	3	
Kalioubieh	Jan. 6-May 22	10	1	
Kena	Apr. 9-May 17	44	26	
Menoufieh	Jan. 2-June 12	48	31	
Mina	Feb. 5-June 26	39	20	
Greece:				
Kalamata				Reported July 15, 1924: Cases, 29; deaths, 6.
Patras	July 7	36		
Saloniki	July 3-4	2		
Hawaii Territory				July 15, 1924: Near Kukuihaele, Island of Hawaii, 1 plague rat.
India				Apr. 20-June 28, 1924: Cases, 102,874; deaths, 84,656.
Do				June 29-July 5, 1924: Cases, 832; deaths, 744.
Bombay	May 4-June 21	50	44	
Do	June 29-July 12	3	3	
Calcutta	May 11-June 14	10	10	
Karachi	May 18-June 21	16	13	
Madras Presidency	May 18-31	7	2	
Rangoon	May 11-June 28	77	72	
Do	June 29-July 19	64	57	
Indo-China				Jan. 1-Mar. 31, 1924: Cases, 154; deaths, 106.
Saigon	May 4-June 28	10	2	Including 100 square kilometers of surrounding country.
Iraq:				
Bagdad	Apr. 20-June 21	121	60	
Japan:				
Shizuoka Prefecture—				
Higashi				To June 20, 1924 Cases, 2; death, 1.
Java:				
East Java—				
Soerabaya	June 8-21	14	14	
Madagascar:				
Diego Suarez	July 4			Present.
Tamatave	June 2-30	2	4	Bubonic.
Tananarive Province				Apr. 1-June 30, 1924: Cases, 138; deaths, 128; bubonic, pneumonic, septicemic.
Tananarive Town	Apr. 1-June 30	12	12	
Other localities	do	105	97	
Persia:				
Abadan	May 1-31	20	12	
Bander Abbas	do	11	6	
Bushire	do	1	1	Landed at quarantine.
Mohammerah	do	111	78	
Peru				May 1-June 30, 1924: Cases, 9; deaths, 6.
Do				July 1-31, 1924: Cases, 6; deaths, 3.
Callao	June 1-30	1		
Do	July 1-31	2		
Huaral	June 1-30	1		
Do	July 1-31	1		
Lima (city)	May 1-June 30	5	5	
Lima (country)	May 1-June 30	1		
Do	July 1-31		1	
Mollendo	do	1	1	
Siam:				
Bangkok	May 4-June 14	3	3	
Syria:				
Beirut	Aug. 4			Present.

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

Reports Received from June 28 to September 12, 1924—Continued.

PLAGUE—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Union of South Africa				Apr. 27–June 7, 1924: Cases, 28; deaths, 14. Dec. 16, 1923, to May 31, 1924: Cases, 347; deaths, 208 (white, 51 cases, 26 deaths; native, 296 cases, 182 deaths).
Orange Free State				May 11–June 14, 1924: Cases, 21; deaths, 9. June 22–28, 1924: Plague-infected mouse found in Kroonstad District.
On vessel:				
S. S. Amboise	July 10	1		At Marseille, France; removed to quarantine station. Case occurred in an Arab fireman embarked at Aden. Vessel left Yokohama May 30 and Colombo, Ceylon, June 22, 1924.

SMALLPOX.

Bolivia:				
La Paz	May 1–June 30	10	9	
Do	July 1–31	5	3	
Brazil:				
Bahia	May 18–24	1		
Porto Alegre	May 18–June 28	1	2	
Rio de Janeiro	May 18–24	2		
Do	July 20–26	1		
British East Africa:				
Kenya—				
Mombasa	May 4–31	3		
British South Africa:				
Northern Rhodesia	May 6–June 30	74	1	Natives.
Do	July 1–7	2		Do.
Canada:				
British Columbia—				
Vancouver	June 15–28	11		
Do	June 29–July 26	18		Not including suburbs.
Victoria	Aug. 3–9	1		
Manitoba—				
Winnipeg	July 13–Aug. 1	3		
New Brunswick—				
Restigouche County	June 1–30	7		
Do	July 6–Aug. 16	19		
Westmoreland County	Aug. 17–23	1		
Ontario				June 1–30, 1924: Cases, 24. July 1–31: Cases, 7.
Sarnia	July 20–26	1		
Windsor	June 22–28	1		
Quebec—				
Montreal	June 8–14	1		
Ceylon:				
Colombo	July 6–12	1		
Chile:				
Antofagasta	June 11			Under treatment at lazaretto, 2 cases.
Valparaiso	June 1–7		1	This report covers the two principal districts of Valparaiso.
China:				
Amoy	May 11–June 28			Present.
Do	June 29–July 19			Do.
Antung	June 9–29	41	3	
Do	July 7–13	4		
Chungking	May 11–June 28			Do.
Do	June 29–July 12			Do.
Foochow	May 18–June 28			Do.
Do	July 6–12			Do.
Hongkong	May 4–June 28	30	24	
Do	June 29–July 12	3	3	
Manchuria—				
Dairen	May 12–June 28	22	7	
Do	June 29–July 6	1	1	
Harbin	May 13–June 23	2		
Nanking	May 18–June 28			Do.
Do	July 6–19			Do.
Shanghai	May 25–31		1	
Tientsin	May 4–June 28	11	1	British municipality.

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

Reports Received from June 28 to September 12, 1924—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Chosen:				
Fusan	May 1-31	1		
Denmark:				
Copenhagen	May 18-31	3	1	
Egypt:				
City—				
Alexandria	June 4-10	1		
Cairo	Feb. 19-May 20	100	25	
Port Said	June 18-24	1	2	
Do	June 25-July 8	3		
France:				
Limoges	Apr. 1-May 31		2	
Marseille	May 1-31		1	
Paris	May 21-31	2		
Gibraltar	July 21-27	1		
Great Britain:				
England and Wales				May 25-June 28, 1924: Cases, 342. June 29-July 26, 1924: Cases, 213.
Counties—				
Derby	May 25-June 28	159		
Do	June 29-July 26	66		
London	....do	1		
Northumberland	May 25-June 28	61		
Do	June 29-July 26	39		
Nottingham	May 25-June 28	29		
Do	June 29-July 26	32		
Yorks (North Riding).	May 25-June 28	54		
Do	June 29-July 26	27		
Yorks (West Riding).	May 25-June 28	5		
Do	June 29-July 26	27		
Greece:				
Saloniki	Apr. 21-May 4	7	2	
Haiti:				
Port au Prince	July 6-12	2		Developed at Cape Haitien.
India				Apr. 20-June 28, 1924: Cases, 28,396; deaths, 6,753.
Do				June 29-July 5, 1924: Cases, 1,549; deaths, 433.
Bombay	May 4-June 28	432	299	
Do	June 29-July 12	60	43	
Calcutta	May 11-June 28	36	32	
Do	July 6-26	27	16	
Karachi	May 18-June 28	51	18	
Do	June 29-Aug. 2	15	10	
Madras	May 18-June 28	32	10	
Do	June 29-Aug. 2	31	9	
Rangoon	May 11-June 28	53	21	
Do	June 29-July 19	11	5	
Indo-China				Jan. 1-Mar. 31, 1924: Cases, 3,058; deaths, 921.
Saigon	Apr. 27-June 28	145	79	Including 100 sq. km. of surrounding country.
Iraq:				
Bagdad	Apr. 20-May 24	8	1	
Italy:				
Messina	May 25-June 1	1		
Jamaica				June 1-28, 1924: Cases, 141. June 29-Aug. 9, 1924: Cases, 154. (Reported as alastrim.)
Kingston	June 1-28	6		Reported as alastrim.
Do	June 29-Aug. 9	12		Do.
Japan:				
Kobe	May 26-June 21	3		
Nagoya	June 8-14	2		
Tokyo	....do	1		
Java:				
East Java—				
Madoera Residency—				
Sampang	May 22			Epidemic.
Malang	May 25-31	5	1	
Soerabaya	Apr. 13-June 28	501	143	
West Java—				
Batavia	May 31-June 27	3		
Do	July 6-12	1		
Latvia				Apr. 1-May 31, 1924: Cases, 2.

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

Reports Received from June 28 to September 12, 1924—Continued.

SMALLPOX—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
Mexico:				
Durango	June 1-30		2	
Guadalajara	May 1-June 30	9	4	
Do	July 8-14		1	
Mexico City	May 4-June 28	96		Including municipalities in Federal district.
Do	June 29-Aug. 16	47		
Salina Cruz	May 25-31	1	1	
Tampico	June 14-20	2		
Do	July 1-31	7	6	
Tuxtepec	July 3-18	3	1	State of Oaxaca.
Palestine				June 17-23, 1924: 20 cases in northern district.
Samaria Province—				
Samak	May 27-June 2	1		
Paraguay:				
Asuncion	June 2			Present.
Encarnacion	do			Many cases reported.
Peru:				
Arequipa	Jan. 1-June 30		5	
Poland				Mar. 30-June 7, 1924: Cases, 261; deaths, 21.
Portugal:				
Lisbon	May 25-June 28	7	2	
Do	June 29-July 19	4	1	
Oporto	May 11-June 28	18	16	
Do	June 29-Aug. 9	13	11	
Russia				Jan. 1-31, 1924: 2,243 cases.
Siam:				
Bangkok	Apr. 27-June 14	3	5	
Spain:				
Barcelona				Year 1923: Cases, 160.
Malaga	June 29-Aug. 16		16	
Valencia	June 8-21	3		
Do	July 13-19	1		
Straits Settlements:				
Singapore	May 4-24	2	1	
Sumatra:				
Medan	Jan. 1-31	5		
Switzerland:				
Berne	May 25-June 28	22		
Do	June 29-July 26	9		
Syria:				
Damascus	May 28-June 12	12		
Tunis:				
Tunis	May 27-June 30	17	4	
Do	July 1-Aug. 11	8	10	
Turkey:				
Constantinople	June 1-7	1		
Union of South Africa				Mar. 1-June 30, 1924: Cases, 167 (white, 15; native, 152). June 29-July 5, 1924: Outbreaks.
Cape Province	May 4-31			Outbreaks.
Orange Free State	May 4-10			Do.
Transvaal	May 4-31			Do.
Johannesburg	July 6-12	1		
On vessel:				
S. S. Karoa	May 7	1		At Durban, South Africa, from Bombay, India. Vessel left Bombay Apr. 16, 1924. Patient, European.
S. S. Mount Evans	July 8	1		At Key West, Fla., from Manchester, England.

TYPHUS FEVER

Algeria:				
Algiers	May 1-June 30	24	9	Year 1923: Cases, 1,166, of which 27 were in the military population.
Bolivia:				
La Paz	July 1-31		1	
Brazil:				
Porto Alegre	June 1-7		1	
Chile:				
Antofagasta				June 16, 1924: Two cases in Lazaretto.
Concepcion	May 20-26		3	
Do	July 8-21		3	
Iquique	June 22-28		1	
Talcahuano	May 25-31	2		
Do	June 29-July 26	16	4	
Valparaiso	May 25-June 21		11	
Do	June 29-July 19		5	

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

Reports Received from June 28 to September 12, 1924—Continued.

TYPHUS FEVER—Continued.

Place.	Date.	Cases.	Deaths.	Remarks.
China:				
Antung	June 2-16	6		
Chungking	May 11-June 14			Present.
Chosen:				
Chemulpo	May 1-June 30	10		
Seoul	do	43	5	
Egypt:				
Alexandria	June 25-July 22	3		
Cairo	Feb. 19-May 20	38	9	
Port Said	July 24-29	2		
Esthonia				Apr. 1-May 31, 1924: Cases, 32.
Germany:				
Coblenz	July 13-19	2		
Great Britain:				
Ireland—				
Dublin	June 8-14	1		
Do	July 13-19	1		
Lismore	July 19	1		
Longford	do	1		
Greece:				
Saloniki	Apr. 20-May 4	6		
Iraq:				
Bagdad	Apr. 27-May 10	2		
Latvia				Apr. 1-May 31, 1924: Cases, 82.
Mexico:				
Durango	July 1-31		2	
Guadalajara	May 1-June 30	2	2	
Mexico City	May 4-June 28	59		Including municipalities in Federal district.
Do	June 29-Aug. 16	53		Do.
Torreon	July 1-31		2	
Palestine:				
Jaffa	June 17-23	1		
Do	July 8	1		
Jerusalem	July 1-28	2		
Kantara	July 15-21	1		
Peru:				
Arequipa	Jan. 1-June 30		4	
Poland				Mar. 30-June 7, 1924: Cases, 2,616; deaths, 252.
Portugal:				
Oporto	June 15-21		1	
Russia				Jan. 1-31, 1924; 14,275 cases.
Spain:				
Barcelona	July 10-16		1	
Syria:				
Aleppo	June 8-14	1		
Tunis:				
Tunis	May 27-June 9	4		
Turkey:				
Constantinople	May 18-June 21	7	2	
Do	July 6-19	1	1	
Union of South Africa				Mar. 1-June 30, 1924: Cases, 418; deaths, 45.
Cape Province				Mar. 1-June 30, 1924: Cases, 249; deaths, 23.
Do				July 6-12: Outbreaks.
Natal				Mar. 1-June 30, 1924: Cases, 27; deaths, 5.
Do				July 6-12: Outbreaks.
Durban	Apr. 20-26	1		
Orange Free State				Mar. 1-June 30, 1924: Cases, 83, deaths, 11.
Do				June 1-July 5: Outbreaks.
Transvaal				Mar. 1-May 31, 1924: Cases, 39, deaths, 5.
Johannesburg	May 11-24	2		
Do	June 29-July 5	1		

YELLOW FEVER.

Brazil:				
Pernambuco	May 11-17	2	1	
Salvador:				
San Salvador	June 10-Aug. 25			Present in San Salvador and vicinity.

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