A COMPARISON OF THE MORBIDITY OF HAGERSTOWN, MARYLAND, SCHOOL CHILDREN IN 1921-1925, 1935-1936, AND 1939-1940[1]

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INTRODUCTION

IN 1921 the United States Public Health Service initiated a survey of absenteeism caused by sickness among the white pupils of the Hagerstown, Md., schools. The results of this investigation, which continued without interruption until 1925, have been described by Collins (3, 4, 5, 6). During the school year 1935-1936 a similar survey utilizing the same technique for collecting the data was again undertaken by the United States Public Health Service but the resulting information remained inedited. Beginning with September, 1939, and as part of a program of studies concerned with various phases of the health of children and of morbidity and mortality in familial aggregates (1), the survey of the causes of absences of school children was resumed with the assistance of a National Youth Administration project.[2]

The principal data regarding the causes of absence for the school year 1939-1940 are now at hand and in this paper they will be compared with results published by Collins for the period December, 1921, to May, 1925, and with results of the survey made in the school year 1935-1936. During the years between 1921 and 1940 the mortality of children has declined. In addition, medical supervision of the health of school children has increased in this and other communities and, in general, medical care of children is now more readily

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[2] The authors take this occasion to express publicly their deep appreciation of the generous cooperation and great interest manifested in this and other investigations by the former superintendent of the Hagerstown schools, Mr. B. J. Grimes; and by the present superintendent, Mr. B. C. Willis; and by the principals and teachers of the public schools; by Rev. Father J. C. Leary of St. Mary's Catholic Parish; Sister Hermes, principal of the school; and by all the teachers.

available than before. Therefore, it is desired to learn how this progress is reflected in the pattern of sicknesses causing school absences.

The Method of Recording Absenteeism

The technique employed in recording school absences in the 1921-1925 survey has been described at length by Collins. That procedure, which was also followed in 1935-1936, consisted in supplying the teachers with forms on which they noted the name of each absent child, the dates and duration of absence, and the cause. Every week a representative of the United States Public Health Service collected these forms and the information thereon was transferred to individual cards. When the current survey was planned it was decided to alter somewhat this technique. In the first place, it was considered desirable to reduce the work and responsibilities of the teachers. Second, the main objective of the whole investigation was to inquire into the incidence and spread of certain illnesses and therefore a continuous and immediate check was required on the causes

Fig. 1a.

MFWC

Surname Name Age Bth. Mo. Da. Yr. School Grade No.

Address Father:name Trade Employ. Mother:name

Dates		Absence			Cause	Physician	
Began	Ended	Total	Other	Sickness	Specify	Yes	No

Passed: _____

of absence, a check not limited to the school but also extended to the home of the child.

The preparatory step in the organization of the current survey was to obtain from the school enrollment lists the name of each child and any other pertinent information. This information was recorded on the individual card reproduced in Figure 1a. The cards pertaining to the children of a school were maintained in that particular school and arranged alphabetically and according to school room or class. A set of files was used for each of the following six categories: Children currently present in school, children already absent one-half day, those absent one day, those absent two days, those already absent three days or more, and children present currently but who had not yet furnished information on the cause of previous absences. In each school the care of the files was entrusted to one or two clerks furnished by the National Youth Administration and was under the daily supervision of one of the authors. (E.B.).

Date_____
Mo. Da. Yr.

Grade_____ Room_____

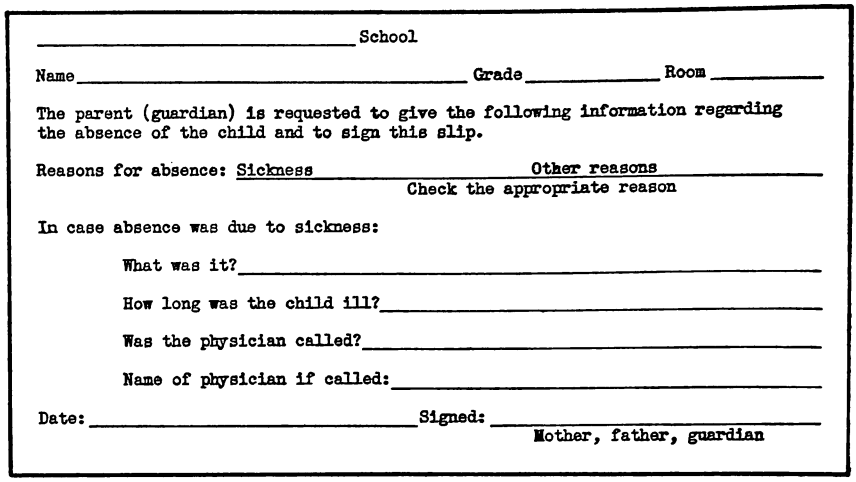
Names of absentees today:

Fig. 1b.

The following steps were followed in the collection and recording of the necessary data:

1. Twice a day the teacher listed or had listed the names of the absentees on the form illustrated in Figure 1b.

2. The clerk in charge of the files collected the absentee lists and



_____ School

Name _____ Grade _____ Room _____

The parent (guardian) is requested to give the following information regarding the absence of the child and to sign this slip.

Reasons for absence: Sickness _____ Other reasons _____
Check the appropriate reason

In case absence was due to sickness:

What was it? _____

How long was the child ill? _____

Was the physician called? _____

Name of physician if called: _____

Date: _____ Signed: _____
Mother, father, guardian

Fig. 1c.

promptly removed the card of each absentee from the "present" file, recorded the date of the beginning of the absence, and placed the card in the "half day absent" file. If the child's name reappeared on the subsequent absentee list, the card was moved to the "one day absent file," and so on.

3. On the child's return to school the date of return and the cause of absence were recorded on the card which was then replaced in the "present" file unless the reason for absence had not been obtained. In this case, the child was furnished with the excuse slip shown in Figure 1c and instructed to have it filled out at home and to return it.

The correctness of the information about the cause of absence was verified mainly by contacts with the parents. In every case when a child had been absent three days or more a visit was immediately made to the home. When a physician had been called his cooperation was also enlisted in order to learn the precise diagnosis made.

After a year's experience, under varying conditions of school discipline and organization and during periods of unusual absenteeism associated with disease or weather conditions, the procedure described proved to be entirely satisfactory. Since it offers an opportunity for the execution of epidemiological or similar investigations, it is brought to the attention of those interested in the study of the

health of school children. In our experience a clerk working two and a half to three hours daily is able to keep posted the file of a school of 500 children. Clerks furnished by the National Youth Administration were utilized in the present survey, but it is obvious that other types of volunteer or paid clerks could be employed.

Material

As in the studies made in 1921-1925 and 1935-1936, the data collected in 1939-1940 relate to white children only. The elementary schools (both public and private), the junior high schools, and the senior high school were covered. Because of the inclusion of the senior high school and the local Catholic school, the sample of children surveyed in 1939-1940 was larger than in any other previous single year and the average age was higher. The figures showing full-time school years' of exposure for 1921-1925, 1935-1936, and 1939-1940 are presented in Table 6. The number of children included in each of the periods is as follows:

Age	*1921-1925*	*1935-1936*	*1939-1940*
6-7	2,796	742	1,151
8-9	3,686	1,109	1,129
10-11	3,354	1,171	1,145
12-13	2,681	1,216	1,260
14 and Over	2,989	793	2,075
All Ages	15,506	5,031	6,760

The mean age of the children of the 1939-1940 survey was 11.7 years; of those surveyed during 1935-1936, 10.7; while for the 1921-1925 period the mean age was 10.0 years. Thus, the children included in the 1939-1940 study were on the average about two years older than those of the first investigation. This difference must be taken into consideration when the comparison of morbidity between the groups is made, since it is a well-established fact that on the whole and for the majority of causes, the morbidity of children decreases with advancing years within the age span of this sample.

Age (in Years)	Case Rate Per 1,000 Children Per Scholastic Year (All Causes)			Ratio	
	1921–1925	1935–1936	1939–1940	1935–1936 / 1921–1925 × 100	1939–1940 / 1921–1925 × 100
6– 7	2,662.5[1]	3,135.4	4,244.5	118	159
8– 9	2,590.5[1]	2,814.7	3,682.9	109	142
10–11	2,267.5[1]	2,325.8	3,158.5	103	139
12–13	2,370.1[1]	2,515.3	2,823.9	106	119
14 and Over	2,211.8[1]	2,940.4	2,919.5	132	132
All Ages	2,412.3	2,694.0	3,296.4	112	137

[1] Excepting twelve cases of mumps about which no information as to age is available.

Table 1. Absences due to sickness in Hagerstown, Maryland, white school children according to age, 1921-1925 (Collins), 1935-1936, 1939-1940.

Sickness Case Rates in 1921-1925, 1935-1936, and 1939-1940

The relative frequency with which the children were absent allegedly because of sickness in the three periods examined is presented in Table 1. The statistical constant used to measure the relative frequency is the case rate per 1,000 children per school year of 180 days. The computation of this constant has been described by Collins *(loc. cit.)* and is based on the formula:

$$\frac{\text{Cases of absence from sickness} \times 1{,}000 \times 180}{\text{Children} - \text{days of school}}$$[3]

From Table 1 the following points seem worthy of special note:

1. Taking all ages together the sickness case rate increased by 12 per cent between 1921-1925 and 1935-1936 and by 37 per cent between 1921-1925 and 1939-1940.

2. The increase between 1921-1925 and 1935-1936 is highest for the age group 14 years and over, but before 14 years it is highest in the youngest age group and seems to lessen with advancing age.

3. The increase between 1921-1925 and 1939-1940 is greatest for the

[3] This formula derives from:

$$\frac{\text{Cases} \times 1{,}000}{\text{Full-time school years exposure to risk}} = \frac{\text{Cases} \times 1{,}000}{\frac{\text{Children days}}{180}}$$

youngest age and lessens with advancing age until the age group 14 years and over is reached when it again becomes high.

4. For all age groups except the oldest the case rate has increased between 1935-1936 and 1939-1940. For the age group 14 years and over the sickness case rates of 1935-1936 and 1939-1940 show little difference. It should be recalled that in 1939-1940 the age group 14 and over contained more older children than in 1935-1936.

Thus it would appear that since 1921 there has been an increase in the relative number of school absences caused by sickness. This trend is most striking for the younger children but is evident at all ages. Since the procedure of collecting the data was altered in the current survey it might be suspected that the increase in the sickness case rate resulted from this change. However, in the 1935-1936 survey the original procedure was carried out and the 1935-1936 results fit into the picture of an increasing trend of the sickness case rate. If the increase observed cannot be attributed entirely to alterations in the method of collecting information, then further study is necessary in order to determine how and why it occurred, particularly since on its face the increase would seem contrary to expectations.

Duration of Absences in 1923-1925 and 1939-1940

During the school year 1939-1940 the number of school days lost per 100 children per school year of 180 days was found to be 1,220. Of this number, 824 days, or 68 per cent, were days lost because of sickness. According to Collins, during 1923-1925 (the only other period for which this information is available) 1,295 school days per 100 children were lost and of them 738 days, or 57 per cent, were due to sickness. Therefore, the total days lost did not change very much in the two periods compared, although the absenteeism due to sickness increased from 57 per cent in 1923-1925 to 68 per cent in 1939-1940.

For the separate age groups the relative number of school days lost from sickness and from other causes is shown in Table 2 where

Age (in Years)	School Days Lost Per 100 Children Per School Year					
	Sickness		Other Causes		All Causes	
	1923–1925	1939–1940	1923–1925	1939–1940	1923–1925	1939–1940
6– 7	1,068	1,260	473	337	1,541	1,597
8– 9	789	893	499	291	1,288	1,184
10–11	627	721	504	362	1,131	1,083
12–13	610	738	681	422	1,291	1,160
14 and Over	523	655	627	493	1,150	1,148
All Ages	738	824	557	396	1,295	1,220

Table 2. Days of absence from sickness and from other causes in Hagerstown, Maryland, white school children, in 1923-1925 and 1939-1940.

the comparison can be made between 1939-1940 and 1923-1925. The figures for 1923-1925 have been calculated from the data given by Collins. Table 2 reveals that between 1923-1925 and 1939-1940 the days lost from sickness have increased for all ages while the days lost from causes other than sickness have decreased. For neither of the two groups of causes is there noted a regular age trend in the increment or decrement between the two periods compared. Moreover, and this is important to keep in mind, there is no apparent consilience between the amount of increment relative to days lost from sickness and the corresponding amount of decrement relative to days lost from other causes. The age group in which the increment is a maximum is not the same as that in which the decrement is a maximum, and vice versa. This finding is to be considered especially in relation to the inference which might be drawn from the finding that total relative number of days of absence has remained practically constant in the periods covered. Because of this it might be inferred that the increase in days absent from sickness is only a consequence of designating in 1939-1940 as due to sickness absences which in 1923-1925 were attributed to other causes. However, it would then be expected that the ages showing the greatest increase in the days lost from sickness would also exhibit the greatest decrease in the days lost from other causes. As already mentioned,

this is not so. How might such an interchange of causes occur? In 1923-1925 the children absent from sickness may have hidden this fact, or in 1939-1940 the children absent from unlawful causes may have attempted to avoid the sanctions involved by claiming sickness. The first assumption obviously cannot be accepted. The second might be acceptable except that the children knew that home visits were made by a representative of this office. Moreover, when the average days lost per case of sickness is calculated it is found (*see* Table 3) that although the average was higher in 1921-1925 than in 1939-1940 for all ages combined, the difference is most apparent in the two youngest age groups. For the 6-7 year age group the average duration of absence per case is 1.2 days longer in 1921-1925 than in 1939-1940. For the 8-9 year age group the difference between the two periods is about 0.8 day; for the 10-11 year age group it is less than one-half day, but for the succeeding age groups there is only a slight difference. This finding would indicate that, especially in the younger ages, the severity of the illness causing school absences has diminished. The increased case rate noted would thus be accompanied by a change in the pattern of absenteeism caused by sickness, *viz.*, by an augmented preponderance of absences due to minor illnesses of short duration. Support for this inference is found in the following sections.

Table 3. Average number of days absent per case of sickness in 1921-1925 and 1939-1940, Hagerstown, Maryland, white school children.

Age (in Years)	Average Number of Days	
	1921–1925	1939–1940
6– 7	4.2	3.0
8– 9	3.2	2.4
10–11	2.7	2.3
12–13	2.5	2.6
14 and Over	2.3	2.2
All Ages	3.0	2.5

Stated Causes of Absence from Sickness in 1921-1925, 1935-1936, and 1939-1940

The case rates of the several diseases or illnesses alleged to be the

Stated Cause	Rate Per 1,000 Children Per School Year						
	1921–1922	1922–1923	1923–1924	1924–1925	1921–1925	1935–1936	1939–1940
All Causes	2,113.8	2,438.1	2,522.6	2,456.9	2,412.3	2,694.0	3,296.4
Colds	746.1	743.0	756.7	642.6	727.3	1031.8	1251.7
Influenza and Grippe	100.1	189.1	50.0	67.2	110.0	60.9	138.1
Tonsillitis and Sore Throat	241.8	221.2	255.0	213.9	232.8	243.2	283.6
Bronchitis and Cough	15.7	9.5	9.6	5.0	9.7	17.3	37.0
Pneumonia	7.7	4.3	4.0	2.7	4.4	2.4	3.3
Croup	17.4	16.4	10.3	17.4	15.0	17.6	16.0
Other Respiratory Diseases	3.2	5.8	5.8	3.7	5.0	10.4	11.7
Tonsil and Adenoid Operations	11.7	6.6	6.3	7.7	7.6	6.4	4.3
Measles	63.8	47.6	2.6	80.9	44.0	1.3	2.0
Mumps	0.8	1.4	0.7	277.4	56.4	2.4	0
Whooping Cough	41.6	0.4	14.7	6.7	12.6	17.1	8.2
Chickenpox	11.3	14.3	19.2	33.4	19.0	9.3	26.0
Scarlet Fever	2.0	5.0	3.5	3.7	3.8	8.9	10.0
Diphtheria	2.0	4.8	5.8	1.3	4.0	0.2	5.9
Digestive Diseases	218.8	244.0	270.4	201.2	238.8	305.9	456.0
Toothache	82.8	118.9	125.3	129.7	116.9	137.8	173.2
Other Conditions of Teeth	5.7	10.1	15.7	14.0	11.7	34.7	45.1
Earache	37.1	44.7	43.9	45.9	43.3	63.1	83.1
Other Ear Conditions	6.5	8.1	11.7	10.7	9.4	14.0	12.7
Diseases of Eyes	58.1	35.2	31.5	26.1	36.1	46.0	31.8
Headache	224.1	317.8	355.9	242.9	298.2	199.9	324.9
Scabies	6.9	1.5	4.2	6.7	4.2	5.1	0.8
Pediculosis	7.7	3.9	5.6	19.4	8.1	4.2	12.0
Boils	11.7	14.1	11.9	8.0	11.9	11.8	8.9
Other Skin Conditions	3.6	18.8	15.0	19.7	15.3	33.3	30.5
Accidents	21.0	40.2	45.1	42.1	38.8	61.4	72.3
Sore Hand, Foot, etc.	23.8	48.9	57.7	42.4	46.0	37.3	54.6
Menstruation	16.1	17.2	17.1	2.0	13.9	24.5	44.1
Neuralgia and Neuritis	9.7	6.4	6.8	2.0	6.2	2.0	2.6
Rheumatism	8.5	6.2	11.7	6.0	8.1	6.2	4.9
Stiff Neck	4.8	5.2	6.8	5.0	5.6	4.0	5.8
Cervical Adenitis	2.8	3.9	4.2	15.7	6.2	9.6	6.3
Heart Conditions	2.0	4.4	5.4	3.7	4.2	8.7	4.9
Unknown Diagnosis	48.0	169.2	267.1	210.2	185.4	177.4	3.5
All Other Diseases and Conditions	48.8	50.3	65.4	40.8	52.5	75.4	120.7

Table 4. Sickness allegedly causing absence from school, Hagerstown, Maryland, white school children.

cause of absence are presented in Table 4 for the single school years from 1921-1922 to 1924-1925, for the combined years 1921-1925, and for the years 1935-1936 and 1939-1940. The classification of illnesses adopted by Collins has been followed.

The data reported in Table 4 throw considerable light on the increase observed in 1935-1936 and 1939-1940 with respect to the 1921-

1925 period. In the first place it is seen that from 1921-1925 to 1939-1940 the increase was not manifest for all conditions nor was it present at all times for both 1935-1936 and 1939-1940. A systematic examination of Table 4 reveals that, compared to 1921-1925:

1. The case rates were progressively higher in 1935-1936 and 1939-1940 for colds, tonsillitis and sore throat, bronchitis and cough, croup, other respiratory disorders, scarlet fever, digestive disorders, toothache and other conditions of the teeth, other skin diseases, accidents, menstruation, cervical adenitis, heart conditions, and all other conditions.

2. The increase was observed for only 1935-1936 or 1939-1940 with respect to influenza and grippe; chickenpox; whooping cough; diphtheria; disorders of the eyes; headaches; scabies; pediculosis; sore hand, foot, etc.; and stiff neck.

3. The rate decreased in both 1935-1936 and 1939-1940 for pneumonia, tonsil and adenoid operations, measles, mumps, boils, neuralgia and neuritis, rheumatism, and unknown conditions.

It is essential to realize that the data for 1935-1936 and 1939-1940 represent information on single years separated by an interval of four years. Therefore, the rates for 1935-1936 and 1939-1940 could represent the results of unusual years, the peak or trough of cycles. In order to take into some consideration such annual fluctuations and to arrive at an estimate of the diseases which definitely increased or decreased beyond the range of the annual fluctuations observed, the rates for 1935-1936 and 1939-1940 will be examined in relation to the annual rates found from 1921-1922 to 1924-1925.

With reference to the conditions placed in group 1 above, Table 4 further shows that the rates for tonsillitis and sore throat, croup, and cervical adenitis are in 1935-1936 and 1939-1940 within the limits of the annual rates from 1921-1922 to 1924-1925. Only in 1935-1936 is the rate for heart conditions somewhat higher than in other years.

With regard to diseases and disorders placed in group 2, the majority have rates that in 1935-1936 and 1939-1940 fall within the ex-

tremes observed from 1921-1922 to 1924-1925. The exceptions are diphtheria, headaches, and stiff neck, which in 1935-1936 are below the lowest rates found before; and scabies, which in 1939-1940 is much lower than previously.

Among the conditions listed in group 3, boils and neuralgia and neuritis remain within the limits of the 1921-1922 to 1924-1925 fluctuations. Only in 1935-1936 is pneumonia below such limits and only in 1939-1940 is this noted for tonsil and adenoid operations, mumps, rheumatism, and unknown causes.

So it appears that in both 1935-1936 and 1939-1940 a marked increase took place in the rates for colds, bronchitis and cough, other respiratory conditions, scarlet fever, digestive disorders, toothache and other conditions of the teeth, earache and other ear conditions, other skin disorders, accidents, and menstruation. In both of these years there seems to have been a definite decrease in measles. In 1935-1936 only the rate for heart conditions exhibited an upward spurt, while the rates for pneumonia, diphtheria, headache, and stiff neck decreased. In 1939-1940 only is there an apparently definite decrease in the rates of tonsil and adenoid operations, mumps, rheumatism, scabies, and unknown causes.

This apparent change in pattern of the sicknesses causing school absences cannot be discussed fully before considering the effects of the differences in age composition of the samples considered. However, it is to be remarked that the rates for toothache, earache, and accidents exhibit an orderly increase from 1921 to 1940. In contrast, the decrease in measles and, to a lesser degree, in mumps may be regarded as the manifestations of the trough in the cyclical occurrences of epidemics of these diseases. The 1939-1940 deviation in the diphtheria rate from its expected decline was caused by a small epidemic in one school among uninoculated children. The marked decline in the 1939-1940 rate for unknown causes reflects the recent modification in the procedure of collecting the data.

Considering altogether the secular changes, the most significant

point to be noted in relation to morbidity and absenteeism is that on the whole there has been no change; in some instances there has been a decrease in the prevalence of diseases that are more important either from the standpoint of fatality in this age period or in terms of length of absence. The increase from 1921-1925 is observed especially in the two most frequent and less important causes of absenteeism, colds and digestive disorders. Together these two conditions in 1921-1925 constituted 43 per cent of the known causes of absence, in 1939-1940 they constituted 55 per cent. As a matter of fact, if there had been no change in the case rate from these conditions between 1921-1925 and 1939-1940 the total case rate would not have altered at all. The bearing that these and the other minor conditions have on the increase in the total case rate from sickness is illustrated in Figure 2.

In Figure 2 the diseases or conditions have been placed from left to right in decreasing order of their importance as measured by the average number of days of absence from each cause [*cf.* Collins (6)]. The case rates are summated proceeding from left to right. For the summation of the first five causes little difference is evident among the three periods. When the rate for measles is added, the 1921-1925 rate is higher than the others and remains so until the rate for accidents is introduced, when the 1939-1940 summated rate becomes the highest. But not until the rate for colds, the eighth from the last cause, is added do the 1939-1940 and 1935-1936 summated rates both rise above that of 1921-1925. As had already been deduced from the consideration of the duration of absences and case rate, this comparison indicates that the main change in pattern from 1921-1925 to 1939-1940 has been towards an increase in the relative frequency of absences from the minor sicknesses which are also the most common in this age period, while the prevalence of absences caused by major illnesses have remained the same or have decreased.

Sex Pattern in Absenteeism from Sickness

The sex composition of the samples of children examined in

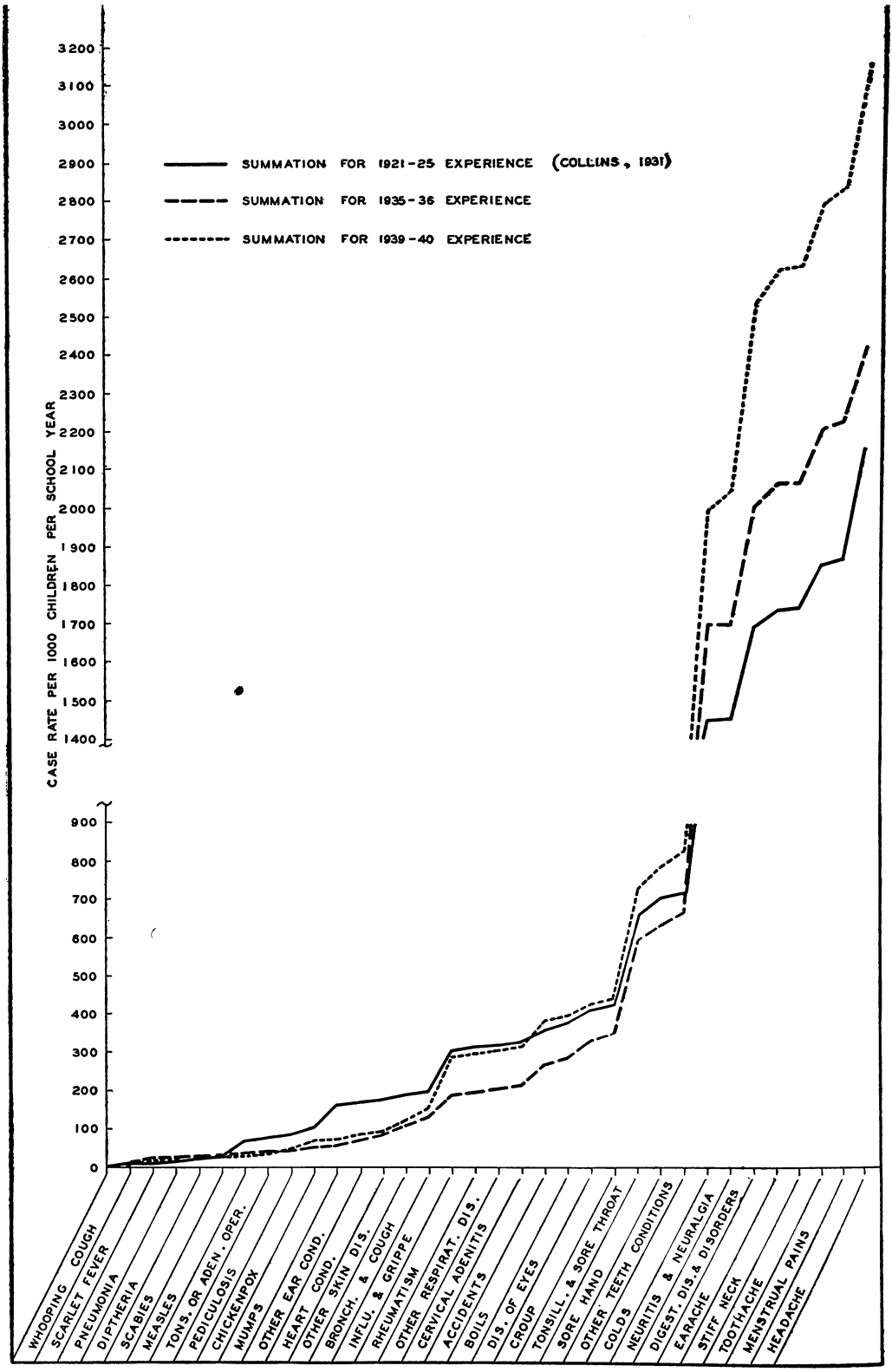


Fig. 2. Summation of case rates of sickness causing absences summated according to order of severity of sickness as measured by days absent per cause.

1935-1936 and 1939-1940, respectively, is practically the same as those surveyed in 1921-1925. What differences exist in the sickness case rates cannot, therefore, be accounted for by sex differences. In the last two surveys it has also been found that the sickness rate of girls is higher than that of boys. This is one aspect of a phenomenon which has long been noted (2), that is, that morbidity is higher in females but mortality is higher in males. The practical significance of this has been generally overlooked and cannot be discussed here

Table 5. Ratio of sickness case rate of girls to that of boys, 1921-1925, 1935-1936, 1939-1940.

Stated Cause	100 Rate for Girls/Rate for Boys		
	1921–1925	1935–1936	1939–1940
Pediculosis	347	406	835
Other Respiratory Diseases	191	171	94
Neuralgia and Neuritis	176	135	308
Cervical Adenitis	176	180	102
Other Ear Conditions	140	110	162
Bronchitis and Cough	135	118	93
Tonsillitis and Sore Throat	131	129	155
Diphtheria	126	—	129
Influenza and Grippe	122	153	133
Headache	117	100	98
Diseases of the Eyes	112	113	113
Other Tooth Conditions	112	91	94
Rheumatism	110	68	90
Earache	108	120	117
Digestive Disorders	107	103	111
Stiff Neck	106	131	41
Scarlet Fever	103	105	148
Colds	99	128	120
Toothache	97	94	112
Measles	97	200	208
Mumps	96	188	—
Other Skin Conditions	93	81	104
Tonsils and Adenoids	88	113	139
Chickenpox	79	135	111
Whooping Cough	73	265	80
Sore Hand, Foot, etc.	71	63	99
Pneumonia	68	60	128
Heart	66	41	175
Accidents	58	56	70
Boils	55	64	48
Scabies	53	115	167

but, it is hoped, will receive an extended study shortly. The sex ratios relative to the several diseases and disorders considered are presented in Table 5. This ratio is computed by the method of Collins: Ratio of rate for girls to rate for boys (boys = 100).

In Table 5 the causes of sickness have been arranged in decreasing value of the sex ratio found in 1921-1925. When the ratios of the three surveys are compared it is found:

1. In all periods the girls have a higher case rate of pediculosis, cervical adenitis, earache and other ear conditions, tonsillitis and sore throat, diphtheria, influenza and grippe, neuralgia and neuritis, diseases and disorders of the eyes, digestive disorders, and scarlet fever.

2. In all the years of the survey the boys have had higher rates for sore hand, foot, etc.; accidents; and boils.

The consistency of the direction of the sex differences relative to these conditions is interesting. Of course, the higher rates for boys with reference to sore hand, foot, etc.; accidents; and boils could be accounted for by the greater exposure to risk on the part of boys as compared to girls. At the same time the low rate for boys for pediculosis is probably associated with the sex differences in hair dress. However, for the other conditions mentioned no convenient explanation of the prevalence in one sex over the other is known. The problem of sex differences, which, if solved, would throw considerable light on a number of public-health questions, deserves more attention than can be given here. A new approach to such a problem has been formulated and it is hoped that a more definitive contribution can be made in the near future.

The changes in the direction of the sex ratio indicated in Table 5 in relation to the changes in case rate may be summarized as follows:

1. With reference to the conditions for which the case rate increased from 1921-1925 to 1935-1936, the increase was greater in the boys for bronchitis and cough, tonsillitis and sore throat, other respiratory conditions, toothache and other diseases of the teeth, other ear conditions,

digestive disorders, other skin diseases, heart conditions, and accidents. The increase was greater in the girls for cervical adenitis, diseases of the eyes, earache, colds, scarlet fever, whooping cough, and scabies.

2. With regard to the conditions for which the case rate increased from 1921-1925 to 1939-1940, the increase was greater in the boys for bronchitis and cough, other respiratory, other teeth, cervical adenitis, and stiff neck. The increase was greater in the girls for colds; tonsillitis and sore throat; influenza and grippe; earache and other ear conditions; toothache; diphtheria; scarlet fever; chickenpox; digestive disorders; pediculosis and other skin diseases; heart conditions; sore hand, foot, etc.; and accidents.

3. For the conditions showing a decrease between 1921-1925 and 1935-1936 the decrease was greater in the boys for pediculosis, influenza and grippe, stiff neck, measles, tonsil and adenoid operations, chickenpox, and boils. The decrease was greater in the girls for neuralgia and neuritis; headache; rheumatism; sore hand, foot, etc.; and pneumonia.

4. When the case rate between 1921-1925 and 1939-1940 diminished, it was associated with a greater decrease in the male rate for diseases of the eyes, measles, tonsil and adenoid operations, whooping cough, neuralgia and neuritis, pneumonia, and scabies; and a greater decrease in the female rate for rheumatism and boils.

The most interesting aspect of these findings is that the increase observed between 1921-1925 and 1939-1940 is in the majority of conditions associated with an increase in the sex ratio. That is, the girls have contributed more to the increase than the boys. The end result, taking all causes together, is that for the children 6-7 years of age the sickness case rate increased by 87 per cent for the girls and 43 per cent for the boys. In the next age group the increment equalled 69 per cent for the girls and 27 per cent for the boys. In the following age group the percentage increase was 48 and 39, respectively. In the 12-13 age group the increase for the girls was 27 per cent and for the boys 14 per cent. The trend is reversed in the case of the oldest age group where the increment is higher in the boys (47 per cent) than in the girls (22 per cent).

Table 6. Sickness (exclusive of mumps) causing absences, by age and sex, Hagerstown, Maryland, school children, 1921-1925 (from Collins, 1931), 1935-1936, 1939-1940.

Stated Cause	Case Rate Per 1,000 Children Per School Year												
	Boys							Girls					
	Year	All Ages	6–7	8–9	10–11	12–13	14+	All Ages	6–7	8–9	10–11	12–13	14+
Colds	1921–25	730.4	970.8	829.8	583.5	589.5	693.0	724.2	1015.4	858.9	607.1	584.4	577.
	1935–36	908.7	1473.9	980.2	666.8	796.3	837.8	1161.9	1595.8	1665.5	948.2	806.1	854.
	1939–40	1140.8	1383.1	1215.8	1047.4	926.7	1150.7	1365.6	2067.3	1591.2	1212.0	981.9	1173.
Influenza and Grippe	1921–25	98.9	88.0	97.0	91.6	81.9	130.3	120.9	91.8	105.7	116.4	133.6	149.
	1935–36	48.4	70.0	52.0	46.2	42.3	37.4	74.1	33.2	86.4	71.0	77.8	97.
	1939–40	118.6	129.9	91.2	89.5	126.3	140.1	158.2	152.4	137.4	162.7	152.4	173.
Tonsillitis and Sore Throat	1921–25	201.4	167.6	238.7	221.0	224.1	139.3	263.8	182.8	261.5	328.4	273.4	269.
	1935–36	212.8	127.9	162.0	158.8	264.3	354.8	275.4	162.9	239.1	272.6	303.9	415.
	1939–40	222.8	208.2	180.5	212.5	235.5	253.8	346.1	326.3	353.8	321.3	311.9	387.
Bronchitis and Cough	1921–25	8.2	19.0	8.7	6.4	2.5	4.9	11.1	22.2	7.2	8.4	7.8	9.
	1935–36	16.0	45.7	16.0	5.5	17.6	2.7	18.8	51.3	24.1	9.6	7.4	10.
	1939–40	38.3	89.8	43.7	26.1	27.3	19.9	35.7	84.0	58.6	17.9	12.4	20.
Pneumonia	1921–25	5.3	15.2	4.1	1.9	2.5	2.4	3.6	8.7	4.2	2.6	—	2.
	1935–36	3.0	9.1	4.0	1.8	1.8	—	1.8	—	6.0	1.9	—	—
	1939–40	2.9	1.9	5.7	3.7	1.7	2.2	3.7	11.7	4.0	2.0	1.8	1.
Croup	1921–25	17.1	42.5	26.1	10.2	5.9	0.8	12.9	29.3	25.4	7.1	2.3	1.
	1935–36	17.7	21.3	28.0	20.3	5.3	16.0	17.4	39.2	20.1	21.1	3.7	6.
	1939–40	17.2	43.9	28.5	14.9	6.8	3.3	14.7	43.0	18.2	9.9	12.4	1.
Other Respiratory Diseases	1921–25	3.4	6.1	2.3	0.6	5.0	4.1	6.5	10.3	7.2	1.3	9.4	5.
	1935–36	7.8	3.0	12.0	1.8	17.6	—	13.3	15.1	8.0	32.6	5.6	—
	1939–40	12.0	7.6	15.2	16.8	15.4	7.7	11.3	13.7	26.3	7.9	3.5	8.
Tonsil and Adenoid Operations	1921–25	8.1	12.9	12.8	7.7	3.3	2.4	7.1	15.0	7.9	7.1	3.1	0.
	1935–36	6.1	6.1	16.0	3.7	1.8	2.7	6.9	12.1	8.0	7.7	3.7	3.
	1939–40	3.6	—	5.7	5.6	5.1	2.2	5.0	15.6	6.1	2.0	—	3.
Measles	1921–25	44.8	150.2	51.1	16.7	5.0	4.9	43.3	142.5	59.8	17.5	7.8	2.
	1935–36	0.9	—	4.0	—	—	—	1.8	3.0	4.0	1.9	—	—
	1939–40	1.3	1.9	1.9	—	—	2.2	2.7	2.0	6.1	4.0	—	2.
Whooping Cough	1921–25	14.6	49.3	16.8	3.8	1.7	1.6	10.7	37.2	15.1	3.9	1.6	—
	1935–36	9.5	36.5	12.0	3.7	1.8	2.7	25.2	84.5	36.2	13.4	3.7	—
	1939–40	9.1	42.0	3.8	1.9	3.4	1.1	7.3	35.2	—	2.0	3.5	1.
Chickenpox	1921–25	21.3	66.0	26.1	8.3	4.2	0.8	16.8	56.2	22.3	7.1	3.9	—
	1935–36	7.8	33.5	8.0	1.8	—	5.3	10.5	36.2	14.1	3.8	1.9	3.
	1939–40	24.7	103.2	24.7	11.2	1.7	2.2	27.4	121.1	32.4	6.0	1.8	—
Scarlet Fever	1921–25	3.8	8.3	7.0	1.9	1.7	—	3.9	8.7	6.0	2.6	0.8	1.
	1935–36	8.7	18.3	14.0	3.7	3.5	8.0	9.1	9.0	14.1	7.7	11.1	—
	1939–40	8.1	11.5	11.4	5.6	6.8	5.5	12.0	27.4	12.1	13.9	12.4	2.
Diphtheria	1921–25	3.5	6.1	4.1	1.3	4.2	2.4	4.4	8.7	7.2	2.2	2.3	0.
	1935–36	0	—	—	—	—	—	0.5	—	—	—	1.9	—
	1939–40	5.2	3.8	5.7	9.3	6.8	2.2	6.7	13.7	8.1	7.9	1.8	4.
Digestive Diseases	1921–25	230.4	215.4	246.2	202.4	291.8	217.4	247.0	214.5	272.4	250.8	235.9	251.
	1935–36	301.5	456.8	236.1	266.0	303.0	301.5	310.6	377.1	295.3	312.9	296.5	283.
	1939–40	432.7	536.8	488.2	397.0	399.4	382.8	479.9	699.5	683.4	501.9	439.5	261.
Toothache	1921–25	118.5	82.7	130.1	129.4	123.7	114.0	115.3	91.8	151.6	118.3	125.0	92.
	1935–36	142.3	134.0	130.0	112.7	149.8	197.4	133.1	81.4	128.6	145.9	140.8	162.
	1939–40	163.7	202.5	178.6	205.0	124.6	133.5	182.9	222.8	309.4	226.1	131.2	100.
Other Tooth Conditions	1921–25	11.1	3.8	15.1	11.5	14.2	8.1	12.4	8.7	10.9	14.9	13.3	14.
	1935–36	36.3	12.2	18.0	46.2	21.1	90.7	32.9	—	42.2	36.5	37.1	40.
	1939–40	46.4	42.0	41.8	39.1	35.8	62.9	43.7	43.0	36.4	41.7	40.8	51.
Earache	1921–25	41.7	78.9	52.8	25.6	34.3	15.5	44.9	65.7	68.9	42.7	35.2	15.
	1935–36	57.5	115.7	70.0	38.8	42.3	40.0	69.1	72.4	70.3	78.7	50.0	81.
	1939–40	76.7	120.4	72.2	82.0	71.7	54.1	89.8	130.9	117.3	89.3	86.8	54

Stated Cause	Year	Case Rate Per 1,000 Children Per School Year											
		Boys						Girls					
		All Ages	6–7	8–9	10–11	12–13	14+	All Ages	6–7	8–9	10–11	12–13	14+
Other Ear Conditions	1921–25	7.8	11.4	5.2	10.2	5.9	5.7	10.9	13.5	12.7	10.3	7.8	9.7
	1935–36	13.0	15.2	30.0	5.5	8.8	5.3	15.1	30.2	8.0	21.1	9.3	10.1
	1939–40	9.7	9.6	7.6	9.3	6.8	13.2	15.7	21.5	14.2	13.9	17.7	13.0
Diseases of the Eyes	1921–25	34.0	26.5	34.3	30.7	44.3	33.4	38.2	36.4	40.5	33.6	45.3	36.0
	1935–36	43.3	54.8	50.0	35.1	42.3	37.4	48.9	39.2	52.2	48.0	57.4	37.1
	1939–40	29.9	26.7	20.9	35.4	20.5	39.7	33.7	39.1	48.5	25.8	33.7	27.1
Headache	1921–25	274.4	174.4	253.8	301.0	401.3	262.2	321.6	181.2	296.6	338.8	385.2	389.0
	1935–36	199.8	121.8	132.0	171.8	244.9	330.8	199.9	129.7	156.7	197.7	229.8	300.5
	1939–40	327.4	332.4	309.7	367.1	322.6	314.4	322.4	349.8	452.9	416.6	304.8	196.4
Scabies	1921–25	5.5	6.1	7.5	6.4	5.9	0.8	2.9	7.9	3.0	1.9	0.8	1.4
	1935–36	4.8	6.1	2.0	5.5	5.3	5.3	5.5	—	10.0	9.6	3.7	—
	1939–40	0.6	1.9	—	1.9	—	—	1.0	—	2.0	2.0	1.8	—
Pediculosis	1921–25	3.6	4.6	4.6	5.1	2.5	0.8	12.5	15.8	15.1	14.9	17.2	1.4
	1935–36	1.7	—	—	1.8	3.5	2.7	6.9	3.0	12.1	5.8	7.4	3.4
	1939–40	2.6	7.6	5.7	—	1.7		21.7	41.0	58.6	19.8	5.3	2.2
Boils	1921–25	15.4	6.1	11.0	12.2	20.1	28.5	8.4	6.3	7.2	7.1	8.6	12.5
	1935–36	14.3	—	4.0	12.9	19.4	34.7	9.1	3.0	6.0	9.6	13.0	13.5
	1939–40	12.0	9.6	7.6	9.3	10.2	18.8	5.7	3.9	4.0	9.9	7.1	4.3
Other Skin Diseases	1921–25	15.9	14.4	22.1	14.1	20.1	9.0	14.8	16.6	27.8	14.9	10.9	3.5
	1935–36	36.8	27.4	32.0	40.6	38.8	42.7	29.7	27.1	28.1	32.6	29.6	30.4
	1939–40	29.9	38.2	26.6	24.2	44.4	21.0	31.0	43.0	60.7	29.8	19.5	16.3
Accidents	1921–25	49.1	36.4	54.6	49.3	60.2	48.9	28.6	29.3	24.2	25.2	42.2	24.9
	1935–36	78.3	70.0	64.0	57.3	82.8	128.1	43.5	27.1	32.1	46.1	51.9	60.8
	1939–40	84.8	78.3	53.2	63.0	99.0	101.5	59.4	33.2	50.5	83.3	74.4	56.4
Sore Hand, Foot, etc.	1921–25	54.0	47.8	48.2	51.9	70.2	48.9	38.1	30.1	38.1	49.8	38.3	27.7
	1935–36	45.4	33.5	40.0	38.8	58.1	53.4	28.8	15.1	48.2	17.3	24.1	40.5
	1939–40	54.9	78.3	60.8	42.9	54.6	54.1	54.4	109.4	72.8	45.6	51.4	20.6
Menstruation	1921–25							27.7	—	—	—	18.8	123.2
	1935–36							50.3	—	—	17.3	76.0	202.6
	1939–40							89.4	—	—	6.0	136.5	204.0
Neuralgia and Neuritis	1921–25	4.5	—	2.9	3.8	10.9	7.3	7.9	0.8	4.2	1.3	13.3	20.1
	1935–36	1.7	—	2.0	1.8	1.8	2.7	2.3	—	—	—	5.6	6.8
	1939–40	1.3	3.8	—	—	—	2.2	4.0	2.0	—	—	7.1	7.6
Rheumatism	1921–25	7.7	3.8	5.8	12.2	10.9	7.3	8.5	2.4	7.9	9.7	10.9	10.4
	1935–36	7.4	3.0	6.0	11.1	5.3	10.7	5.0	—	6.0	—	13.0	3.4
	1939–40	5.2	—	7.6	7.5	3.4	6.6	4.7	2.0	6.1	2.0	1.8	8.7
Stiff Neck	1921–25	5.4	2.3	4.1	4.5	12.5	5.7	5.7	3.2	8.5	1.9	6.3	7.6
	1935–36	3.5	—	4.0	5.5	1.8	5.3	4.6	3.0	2.0	1.9	5.6	13.5
	1939–40	8.1	1.9	5.7	7.5	8.5	13.2	3.3	2.0	—	6.0	7.1	2.2
Cervical Adenitis	1921–25	4.5	3.8	7.5	3.8	2.5	2.4	7.9	7.9	10.3	12.9	5.5	2.1
	1935–36	6.9	6.1	2.0	12.9	7.0	5.3	12.4	—	12.1	28.8	11.1	—
	1939–40	6.2	5.7	11.4	5.6	5.1	4.4	6.3	11.7	4.0	4.0	10.6	3.3
Heart Conditions	1921–25	5.0	3.8	1.7	6.4	7.5	8.1	3.3	—	3.0	5.8	5.5	1.4
	1935–36	12.1	—	10.0	—	35.2	8.0	5.0	—	4.0	7.7	3.7	10.1
	1939–40	3.6	1.9	5.7	5.6	3.4	2.2	6.3	3.9	14.2	7.9	1.8	5.4
Unknown	1921–25	169.3	177.5	141.1	188.9	231.6	124.6	201.2	190.7	130.5	199.8	225.0	278.2
	1935–36	150.5	167.5	106.0	92.4	190.3	218.8	205.9	277.5	215.0	176.6	164.9	236.3
	1939–40	3.2	3.8	5.7	7.5	—	1.1	3.7	11.7	4.0	6.0	—	—
All Other Diseases	1921–25	42.8	52.3	42.4	41.0	45.2	36.6	62.1	66.5	58.6	55.6	64.1	67.1
	1935–36	65.3	33.5	40.0	96.0	56.4	96.0	86.0	39.2	78.4	109.4	100.1	84.4
	1939–40	98.1	124.2	104.5	96.9	95.6	81.6	143.8	179.8	165.8	162.7	108.1	123.7
Full Time School Years of Exposure	1921–25	7411.9	1318.5	1722.1	1561.3	1196.0	1228.0	7509.0	1263.6	1655.6	1546.8	1280.0	1444.8
	1935–36	2312.1	328.4	499.9	541.4	567.6	374.8	2186.0	331.5	497.7	521.0	539.6	296.2
	1939–40	3078.9	523.5	526.4	536.6	586.0	906.4	2996.7	511.8	494.6	504.0	564.3	921.8

Age and Sickness Case Rate

In Table 6 are presented the case rates relative to the several diseases and disorders divided according to age and sex as observed in 1921-1925, 1935-1936, and 1939-1940. As already mentioned, the average age of the 1939-1940 sample is higher than that of the 1921-1925 children. However, as the data of the table indicate, this does not affect the increase in case rate.

With reference to the age pattern of the prevalence of the several causes, the rates shown in Table 6 are in general agreement with those observed in 1921-1925 by Collins. In the majority of cases, it appears that the rates are higher in the youngest children and decrease with age. This is noted for colds, croup, bronchitis and cough, pneumonia, whooping cough, and scabies. For a few causes, such as influenza and grippe, and boils, there seems to be a definite tendency toward an increase with advancing age. In others, such as digestive disorders, headaches, and toothaches, there is no definitive trend.

A detailed examination of Table 6 will reveal that the increase or decrease in rates from 1921-1925 to 1935-1936 and 1939-1940 is not remarkably associated with age. In general, and probably due to the relative smallness of some of the rates, it may be said that with respect to the age groups into which the population of children has been segregated the increase is irregular with no consistent trend in evidence. Among the twelve illnesses whose case rates appear to have increased significantly in 1935-1936 and 1939-1940, the increment is about the same at all ages for colds, other respiratory conditions, other conditions of the teeth, and other ear conditions. The increase is more marked in the older ages for scarlet fever, earaches, and other skin conditions; it is more distinct in the younger ages for digestive disorders and menstruation. For toothache the increase from 1921-1925 to 1935-1936 is greater in the older children but from 1921-1925 to 1939-1940 it is greater in the younger. With ref-

erence to bronchitis and cough, and accidents, the increase in the rate for boys is about the same at all ages but for the girls the increase of the former appears more at the younger ages while that of the latter seems to be higher among the older girls.

The incidence of measles and tonsil and adenoid operations has decreased essentially among the younger children. That the decrease in the measles case rate should affect the youngest ages is not surprising because of the age incidence of this disease. With regard to the decline in tonsil and adenoid operations the age pattern of the decline also conforms to expectation. However, the lowering of the frequency of this operation may not be real. It could be caused by operations being performed in preschool years or timed so that hospitalization would fall within the summer vacations. The increase in the case rate of menstruation is of particular interest. It will be observed that among the girls 14 years and over the increase in the rate is about 60 per cent between 1921-1925 and both 1935-1936 and 1939-1940. But among the girls 12-13 years old the rate in 1935-1936 is four times and in 1939-1940 is seven times that of 1921-1925. This finding need not indicate that menstrual pains are more common now among the young girls. In view of the greater precocity of growth, some evidence of which is shown by Wolff's (7) data on the same sample of children, the increased absence because of menstrual pain may be an indication of a more precocious puberty.

Attendance by Physician in 1921-1925 and 1939-1940

In Figure 3 the frequency with which in 1921-1925 and 1939-1940 a physician was called by the parents is compared for each cause of absence. On the whole, it is immediately seen that no remarkable change took place either in the percentage attendance or in the order of frequencies. As in 1921-1925, during the school year 1939-1940 a physician was always in attendance in the case of pneumonia, diphtheria, and tonsil and adenoid operations. In the latter year, the scarlet fever cases were also always attended by a physician. It

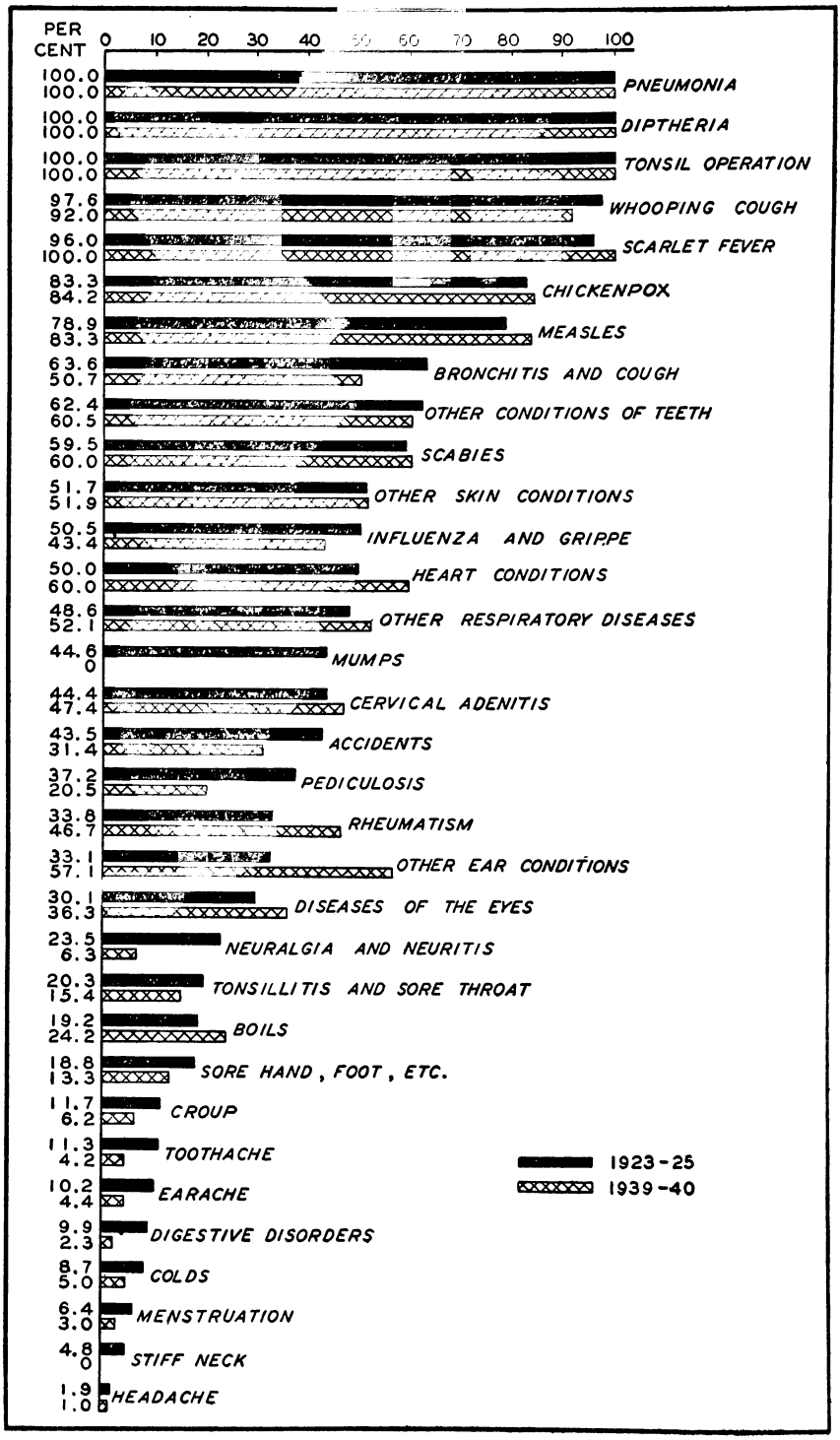


Fig. 3. Per cent cases attended by physicians.

will be observed that for the other so-called infectious diseases of children the percentage of cases presumably treated by a physician has not altered during the periods compared. When a decrease in the percentages has occurred it is associated with the minor conditions and particularly those that have become more prevalent. Thus, physicians were called to attend 8.7 per cent of the colds in 1921-1925 and only 5.0 per cent in 1939-1940, 9.9 per cent of the digestive disorders in 1921-1925 and only 2.3 per cent in 1939-1940. In addition to these conditions a marked decline in the percentage of cases attended by physicians is seen for neuralgia and neuritis; menstruation; sore hand, foot, etc.; stiff neck; and croup.

The augmented total morbidity case rate has not been accompanied by an increase in the total frequency with which medical attention has been obtained. As is obvious, this is caused by the sharp decline in the frequency with which physicians have attended cases of the most common causes of absenteeism due to sickness. No such decline is observed with reference to the major and more important diseases of childhood. Therefore so far as this sample of children is concerned, it does not seem that between the periods compared the desire or means of obtaining medical attention has been reduced. It appears more likely, in view of the characteristics of the increase in sickness case rate, that the findings relative to the attendance by physicians emphasize again that the sickness rate increment observed is associated essentially with an increase in conditions of such a mild nature that in the eyes of responsible persons, parents or guardians, the advice of a physician was not warranted.

Discussion

The main findings which emerge from this comparison of the absenteeism due to sickness in 1939-1940 and 1935-1936 with that of 1921-1925 are:

1. The case rate is higher in the two latest surveys.
2. In general the increase in the case rate is more marked in younger

children and in girls and is accompanied by a reduction in the total relative number of cases attended by physicians.

3. The increase is on the whole limited to absences allegedly due to colds, bronchitis and cough, other respiratory diseases, scarlet fever, toothache, earache, digestive disorders, accidents, other skin diseases, and menstrual pains.

The increment in the case rate of these conditions, particularly for colds and digestive disorders, is of such magnitude that it cannot be balanced by the decrement in the rate of measles and it masks the fact that the level of the rates of all the other illnesses and diseases has not altered much during the time interval considered. Several general factors evidently contribute to the observed changes. The higher prevalence of accidents is not surprising and in the case of vehicular accidents reflects a serious situation. The increase is more marked in girls probably because the present mores permit more outdoor play to this sex. It may be that the current customs in dress are related to the increase in the spread of impetigo which forms the main disease included in the category "other skin diseases." On the other hand, the increase in the relative number of girls absent because of menstrual pains could probably be associated with the earlier onset of puberty which, according to a number of observers, characterizes the more recent generations. On this basis then, the higher rate of absences would be a consequence of the increase in the number of girls who were subject to menstrual pains.

It could be assumed, in view of the epidemiology of scarlet fever and measles, in particular, that the respective decrease and increase in case rate are fortuitous. The significant point about the increase in the prevalence of scarlet fever is that it has affected mostly the older children while the fatality from the disease was not increased.

The increase in the rate of toothache and earache seems to represent a trend evident since 1921. Since there is an increase in the rate of other conditions of the teeth and of the ears (including absences due to dental or otological treatment), the apparent trend

may have real significance worth investigating further. Whether this increase is associated with the increase in colds and other respiratory upsets cannot be determined at this stage.

The increase in the frequency of absences due to colds and to digestive disorders, the most common and indefinite indispositions, constitutes the bulk and the main feature of the higher sickness case rate. With respect to colds it is noted that there has been no corresponding increase in the absences due to the major forms of respiratory diseases: influenza and grippe and pneumonia. In view of this it may be doubted that the increase in absences from colds is the outcome of a greater incidence of this condition. For colds, and for digestive disorders also, a remarkable decline is observed in the relative number of cases attended by physicians. This finding, taken together with the apparent diminished severity of the illnesses as measured by duration of absence and the preponderance of the increase in the younger age groups, leads one to suspect that the higher sickness case rate as affected by the change in the absenteeism from these mild indispositions is probably not due to an increase in the prevalence of these conditions. That is, children with colds and digestive disorders are now more often absent but the number of colds and digestive upsets are more or less the same. If this inference is justified then the increase in the case rate of these conditions is essentially the result of greater care or precautions taken now by parents. In a sense this is to be expected if the health propaganda by private and public agencies regarding the need for early treatment of minor disorders has any effect. In other words, the more extensive education of the public concerning health would bring about a situation such as this in which children are absent more often from school for short periods of time and because of conditions that in a less enlightened era would not have been considered a legitimate cause of absence. The validity of this view will be examined in a subsequent report dealing with absenteeism in the socio-economic groups.

SUMMARY

This paper presents data on the absenteeism due to sickness among the white children of the schools of Hagerstown, Maryland, during 1939-1940, and the absenteeism observed in the same community during 1935-1936 and 1921-1925. Data for the 1921-1925 period are derived from the reports of S. D. Collins *(loc. cit.)*.

The comparison reveals:

1. In 1935-1936 the sickness case rate from all causes increased by 12 per cent, and in 1939-1940 by 37 per cent over the rate recorded in 1921-1925.

2. On the whole, the increase in the total absence due to sickness has been greater for girls.

3. The higher case rate observed in recent years results primarily from a marked increase in the absenteeism allegedly due to colds and digestive disorders. In 1939-1940 the rate for the former was 72 per cent greater than in 1921-1925 and for the latter it was 91 per cent greater. In addition to these two causes it is noted that in 1935-1936 and 1939-1940 there was a slightly higher prevalence of absences associated with bronchitis and cough, scarlet fever, toothache and other dental conditions, earache and other otological disturbances, other skin disorders (impetigo), accidents, and menstrual disturbances.

4. No definite change is observed in the case rates of absences due to influenza and grippe, pneumonia, croup, tonsillitis and sore throat, mumps, chickenpox, whooping cough, diphtheria, heart conditions, rheumatism, disorders of the eyes, headache, neuralgia and neuritis, soreness of the limbs, stiff neck, pediculosis, boils, and scabies.

5. In 1935-1936 and 1939-1940 the case rate of absences due to measles was lower than that in 1921-1925.

6. The number of days of absence due to sickness rose from 7.4 days per child in 1921-1925 to 8.2 in 1939-1940, but the average dura-

tion of absence per case of sickness fell slightly, from 3.0 to 2.5 days. This decrease is mainly among the younger children.

7. For the majority of illnesses causing absence the frequency with which a physician was in attendance remained the same in the periods compared. However, the percentage of cases attended by a physician fell from 8.7 per cent in 1921-1925 to 5.0 per cent in 1939-1940 for colds and from 9.9 per cent in 1921-1925 to 2.3 per cent in 1939-1940 for digestive disorders.

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