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Age Incidence of Specific Causes of Illness Found in Monthly Canvasses of Families

—Sample of the Eastern Health District of Baltimore, 1938–43—

By SELWYN D. COLLINS, Ph.D., F. RUTH PHILLIPS, and DOROTHY S. OLIVER*

There are a number of ways to describe the illness situation in a given population: the incidence and prevalence of illness by age and sex; the seasonal variation in the case load; variation with economic, occupational, or social status; variation with climatic and weather conditions; and variation with other characteristics. But the one item that tells most about a given illness and also about the nature and the burden of the case load in a given population is the diagnosis of the case. The diagnosis usually gives a general idea of the expected duration of the disease, whether recovery is probable, and, if so, whether it will be complete or leave the patient permanently impaired.

Because of these facts, some of the papers on illness in a sample of the Eastern Health District of Baltimore deal with more or less specific diagnoses rather than broader groups of diseases. This particular study sets up curves to indicate the ages most affected by any specific disease with enough cases reported in the survey to give reasonably accurate results.[1]

A preceding study in this series dealt with specific causes of illness among persons of all ages (*2*) with considerable detail about the selection of the population sample and a comparison of its various characteristics with other urban groups. Suffice it to say here that the sample under discussion included 21,505 full-time person-years of observation of white residents of the original Eastern Health District (Wards 6 and 7) of Baltimore, who were visited at monthly intervals to obtain from the household informant (usually the housewife) records

*From the Division of Public Health Methods, Public Health Service. The Milbank Memorial Fund, the Departments of Biostatistics and Epidemiology of the Johns Hopkins School of Hygiene and Public Health, and the Baltimore City Health Department cooperated in the study. Grateful acknowledgment is made to Jean Downes of the Milbank research staff who participated in all phases of the Baltimore Morbidity Survey.

[1] In some respects this paper duplicates some of the data in preceding studies (*4, 5*). However, the present study deals primarily with specific diagnoses with special reference to durations of cases during the whole study and to rates among the very old and the very young.

of illness of all types, disabling and nondisabling, accident and disease, among the members of the family.

The preceding study (*2*) included for specific diagnoses the rates for various types of illness such as the total cases reported to the interviewers; the disabling cases, defined as those that kept the patient from gainful work, school, housework, or other usual activities; the average annual days of such disability per person observed; the average days of disability per disabling case; cases that confined the patient to the house, and cases that confined to bed for 1 or more days.

The present study deals largely with total cases (both disabling and nondisabling) of specific diagnoses for persons of various ages. However, some consideration is given to the age variation in several types of rates such as those for disabling acute and chronic cases and days from all diagnoses combined.

Disabling Illness From Acute and Chronic Diseases

In the Baltimore study there was an annual rate of 650 disabling cases per 1,000 canvassed population, consisting of acute cases of disease and accident and of disabling attacks or episodes of chronic disease. The acute and chronic diseases are different in many ways. The acute diseases are predominant in the younger ages but the chronic diseases are important among the aged; the acute occur in large numbers but are of short duration, with complete recovery as the usual termination. Although the chronic occur less frequently they are important because of their long durations and frequent permanent residual effects or fatal termination. Thus, there is an extremely uneven burden of chronic illness; the relatively few afflicted individuals tend to be of the older ages when they are least able to bear the expense of thorough treatment with long hospitalization and other medical care.

The annual frequency of cases of illness at specific ages does not describe the whole situation. In fact, frequency of cases can be expressed in several different ways:

1. Incidence measures the rate of new cases with onset during the study period. In view of the insidious character of the onset of many chronic diseases, it is hard to fix the original date of onset of the disease, but it is usually feasible to determine when the patient was first disabled or when the particular disease was first diagnosed by a doctor. The figure for the annual new cases (incidence) of specific chronic diseases per 1,000 population seems to be the most useful rate for control and measurement purposes. However, new cases of chronic diseases are not large in frequency although long in duration.

2. In the absence of data for a large population, prevalence of chronic disease on a given day may be useful.

3. The total number of patients suffering from a given chronic

disease during the study period (regardless of date of onset) is obtainable and may be of considerable value since this rate measures the case or treatment load for the year.

4. Another measure of chronic disease is the number of disabling attacks or episodes occurring during the study period. In terms of all causes of illness, this measure of disabling attacks within a given time would seem directly comparable with the number of cases or attacks of acute diseases. However, in studies covering several years it occasionally happens that one individual may suffer as many as 30 or more attacks or episodes of a given chronic disease, and like any extreme item in a distribution, it may bias considerably the curve of age specific case rates. It is for this reason that for some diseases and in some situations broader age intervals have been used in the age curves (table 2).

In the present study where numbers are not large, chronic disabling cases have been tabulated in terms of disabling attacks or episodes. An important supplementary rate also shown is the annual days of disability per person observed, a rate which seems to be free from the biases mentioned above.

Figure 1 and table 1 show age-specific rates of various kinds for all causes, for acute diseases and accidents, and for chronic diseases. It should be noted that these age curves are on a relative basis; the curves represent ratios of the rate in each age to the rate for all ages, but the vertical rate scales are labeled in actual disabling cases per 1,000 persons or in days of disability per person observed.

The top section of figure 1 shows rates for all types of cases for all causes. It is seen here that the frequency of cases from all causes is high in the younger ages but relatively low in the older, whereas the prevalence curve and the days lost per person observed show the opposite, that is, rather low rates among children and youth and high rates among older persons.

Although the disabling prevalence per 1,000 population observed is obtained from a count of disabled persons on a given day, it may also be thought of as the number of days of disability out of 1,000 person-days of life, that is, one person-day for each individual covered by the interview. Of course this interpretation neglects the fact that a person who was not disabled when interviewed may later in the day become sick or even die. However, the error from such occurrences would be small. Considering prevalence in this way, one would expect its relative age curve to resemble in its general aspects, as it does, that of the days of disability per person observed; both curves represent days—the one a count of all disabled days within the period that the individual was under observation, and the other, prevalence, a sample of one day (date of visit) from each month that the individual was under observation.

Table 1. *Illness rates* [1] *of various kinds from all causes among white persons of specific ages canvassed at monthly intervals in a sample of the Eastern Health District of Baltimore, 1938–43*

[Disabling cases; sole and primary causes only]

Type of case	All ages		Age										
	Number cases or days	Rate	Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65–74	75 and over
	Annual frequency of disabling cases per 1,000 population [2]												
All	13,987	650	1,377	1,308	786	473	479	490	507	495	574	551	531
Acute	12,363	575	1,370	1,278	733	450	454	457	414	372	383	329	233
Chronic	1,624	75.6	7.5	29.6	52.7	23.3	25.0	33.5	92.7	122.5	191.1	222.2	297.7
Temporary [1]	1,412	65.7	5.6	23.3	47.0	21.4	18.8	29.2	85.1	110.5	167.1	185.2	216.8
Permanent [1]	212	9.9	1.9	6.3	5.7	1.9	6.2	4.3	7.6	12.0	24.0	37.0	80.9
	Average prevalence of disabling cases per 1,000 population [2]												
All	9,443	36.6	41.2	50.3	38.4	22.3	28.2	23.1	25.7	30.3	58.1	78.9	164.9
Acute	4,212	16.3	40.1	39.3	18.6	11.5	13.7	13.4	13.1	9.3	7.7	7.1	15.4
Chronic	5,231	20.3	1.1	11.0	19.8	10.8	14.5	9.7	12.6	21.0	50.4	71.8	149.5
	Annual days of disability per person observed [2]												
All	341,523	15.9	15.5	19.3	13.4	7.2	9.4	9.0	11.8	17.3	29.9	41.3	71.9
Acute	127,210	5.9	12.8	11.9	5.2	3.7	4.9	4.7	5.0	4.5	5.3	5.6	6.0
Chronic	214,313	10.0	2.7	7.4	8.2	3.5	4.5	4.3	6.8	12.8	24.6	35.7	65.9
Temporary	60,850	2.91	.39	2.23	2.78	1.63	.78	1.05	2.58	3.89	6.07	11.09	11.59
Permanent	153,463	7.05	2.28	5.15	5.45	1.91	3.77	3.28	4.23	8.86	18.53	24.64	54.29
	Days of disability per disabling case												
All	13,987	24.4	11.2	14.8	17.1	15.2	19.8	18.3	23.3	34.8	52.2	75.0	135.5
Acute	12,363	10.3	9.3	9.3	7.1	8.1	10.9	10.2	12.0	12.0	13.9	17.1	25.9
Chronic	1,624	132	355	249	156	152	182	130	74	104	129	161	221
Temporary	1,412	43	70	71		61		36	30	35	36	58	
Permanent	212	724	1,212	884		697		773	560	736	771	665	671

[1] Cases in this table represent disabling attacks or episodes of acute and of chronic diseases. Thus, acute and chronic cases are on the same basis, and the same individual may have had more than one attack or episode of the same acute or chronic disease within a given study period. All tabulations for all causes (including all acute cases and all chronic attacks) count cases (periods of disability) and days of disability only once, regardless of the number of diagnoses it requires to describe the diseases from which the patient is suffering.

Chronic permanent disabling cases consist of those in which the patient was disabled throughout the period of his observation. Other chronic disabling cases are classified as chronic temporary attacks or episodes, some of which had their onset of disability prior to the time the patient entered the study. For all causes combined the great majority of the disabling cases are acute with onset within the patient's period of observation. Thus, the combined age curve for cases of all causes resembles the frequency of acute disabling cases more closely than the age curve of disabling prevalence.

Days of disability per person observed counts the days within the study period only, without respect to dates of onset or termination of the disability. Thus, this day rate for chronic diseases is the same whether it is counted as the total days of disability suffered during a given time by an individual with a chronic disease or whether it refers to the disability summated from the disabling attacks or episodes.

[2] Rates, except prevalence, are based on full-time years of life observed (see table 2); prevalence rates are weighted averages of prevalence for the 60 months of the survey, the weights being proportional to the number of individuals covered by the interviews during the month. That is, the population used was the total individuals covered by the interviews, and the cases were the total persons who were reported as disabled at the time of the interview. The total interviews (populations) for computing prevalence rates were: All ages, 258,067; under 5, 19,145; 5–9, 19,026; 10–14, 20,954; 15–19, 24,640; 20–24, 23,046; 25–34, 45,163; 35–44, 38,071; 45–54, 32,889; 55–64, 19,968; 65–74, 11,335; 75 and over, 3,712.

The last measure, days of disability per disabling case, rises continuously with age, the youngest age groups having the shortest durations per case for all causes. The reason appears to be that in the early ages the short-duration acute cases dominate the situation,

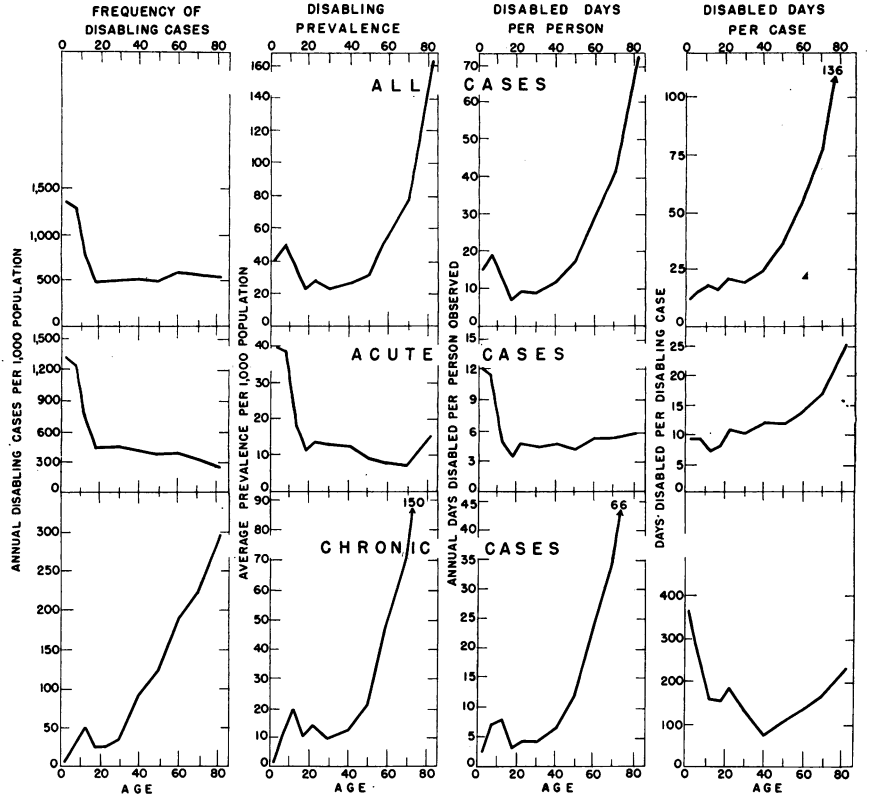

Figure 1. Age variation in rates of acute and chronic disabling illness from all causes as measured by case frequency, prevalence, and by days per person observed and per case—Eastern Health District of Baltimore, 1938–43.

NOTE: Both acute and chronic cases or attacks are represented by periods of disability with onset within the study period, except for the chronic permanent and some chronic temporary cases. See note to figure 2 for further definitions.

Throughout this paper the vertical rate scales on the charts change for the different diseases or types of cases. However, in all instances, the rate for both sexes of all ages represents on the vertical rate scale a distance equal to 30 years on the horizontal age scale. Thus the curves are on a relative basis like a curve representing the ratio of the rate in each age to the rate for all ages combined. However, the vertical rate scales have been put on in terms of actual rates and disabling days.

but in the older ages the long-duration chronic diseases are more important.

When the acute and chronic conditions are viewed separately, the age curves for these two types of illness are quite different. However, the three kinds of measures—frequency, prevalence, and days of disability—are similar in their general outlines for acute cases and for chronic cases. Thus the age curve for the mixture of acute and chronic diseases does not give a true picture of the real situation because the component parts lack homogeneity.

Even the breakdown into acute and chronic diseases is too crude for all purposes. Figure 2 illustrates in a rough way the age selection of chronic temporary cases and days of disability, as compared with

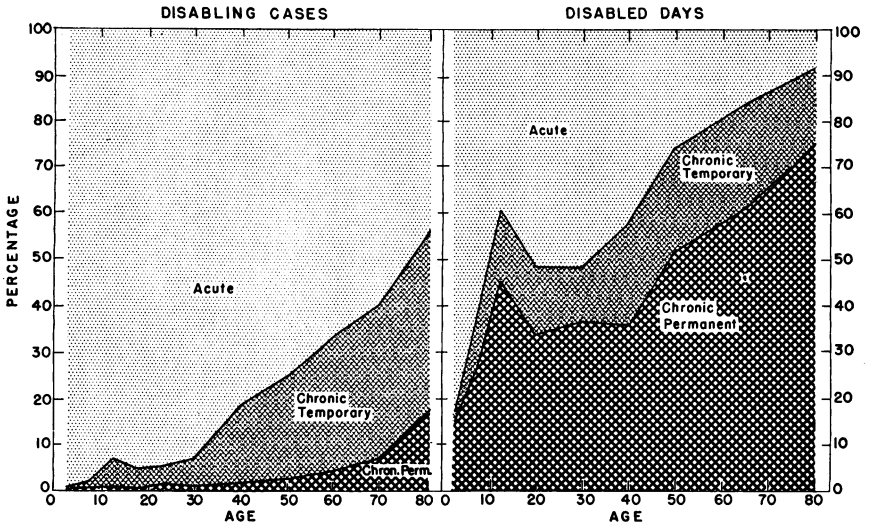

Figure 2. Age variation in the proportion of cases and of days of disabling illness from all causes classified as acute disability, chronic temporary disability, and chronic permanent disability—Eastern Health District of Baltimore, 1938–43.

NOTE: Chronic permanent disability refers to those cases which disabled throughout the period of the patient's observation; other chronic cases are classified as chronic temporary disability.

chronic permanent and with acute cases and days. On the left of figure 2, the data show for specific ages what proportion of the disabling cases or episodes were acute, chronic temporary, and chronic permanent. The right half of the figure shows the same data for days of disability. Chronic permanent disability pertains to patients who were disabled when the family entered the study and throughout the time that they were under observation. Chronic temporary disability refers to chronic patients who were well enough to be about their work or other usual activities for a part of their period of observation.

At no age under 30 years do the chronic disabling cases or attacks constitute as much as 7 percent of the disabling case load, and even at 75 years and over they constitute only 56 percent of the disabling cases. As one would expect, the picture for days of disability is quite different from that for cases or attacks. Under 5 years of age, 83 percent of the days of disability were due to acute diseases; from 5 to 35 years, an average of about half of the disabled days were acute; above 35 years the percentage of days of disability that represent chronic cases rises rapidly until for the group over 75 years, only 8 percent of the days of disability were due to acute diseases. However, the percentage of days of disability due to chronic temporary cases is not so large; from 5 to 35 years of age the chronic temporary days of disability constitute less than one-third of the total chronic days of disability; above 35 years the rise in the percentage of disabled

days due to chronic disease comes largely from chronic permanent disability, and at 75 years and over, 75 percent of all days of disability are due to chronic permanent disability.

Considering all ages combined, acute disabling cases constituted 88 percent of all disabling cases, but their days of disability accounted for only 37 percent of all days of disability; chronic temporary cases constituted 10 percent of all disabling cases but 19 percent of days of disability; chronic permanent cases (including institutional) constituted 2 percent of all disabling cases and 44 percent of all days of disability.

Figure 3 shows a number of age curves for chronic temporary and chronic permanent cases and days of disability and for acute cases and days of disability. As in figure 1, these curves are on a relative basis, but the actual rates have been put on the vertical rate scales.

It is seen in the left and center columns of figure 3 that acute case and day rates show considerably less variation with age than either type of chronic case and day rates. The days of disability per chronic disabling case show exceptionally long durations of disability, particularly for the chronic permanent cases. However, this chronic permanent duration really represents the person-days of life observed, since by definition the patients in this permanent category were disabled throughout their period of observation. Nevertheless, it is of interest that in a random selection of households there should be so much time lost because of what might be roughly designated as invalidity. The tremendous difference in actual durations for the three types of cases is indicated by the averages for all ages: acute disabling cases averaged 10 days of disability per case; chronic temporary disabling cases averaged 43 days of disability per case; and the chronic permanent disabling cases averaged 724 days of disability per case. Of the latter category, the 38 institutional cases averaged 796 days of disability as compared with 708 days for the 174 noninstitutional chronic permanent disabling cases.

Age-Specific Rates for Detailed Diagnoses

In the Baltimore survey, the total annual case rate (nondisabling and disabling) [2] was 1,379 per 1,000 population. More than half of the patients, 729 per 1,000, were not disabled in the sense of being unable to work, attend school, do housework, or pursue other usual activities. There are a considerable number of diseases for which the cases are rather largely nondisabling; for example, the allergies except asthma; the minor skin diseases; and some minor communicable diseases, particularly among children. Also, many of the

[2] In this study disabling and nondisabling chronic cases are represented by disabling attacks or episodes plus a count of chronic cases that did not cause disability at any time during the period of observation of the patient.

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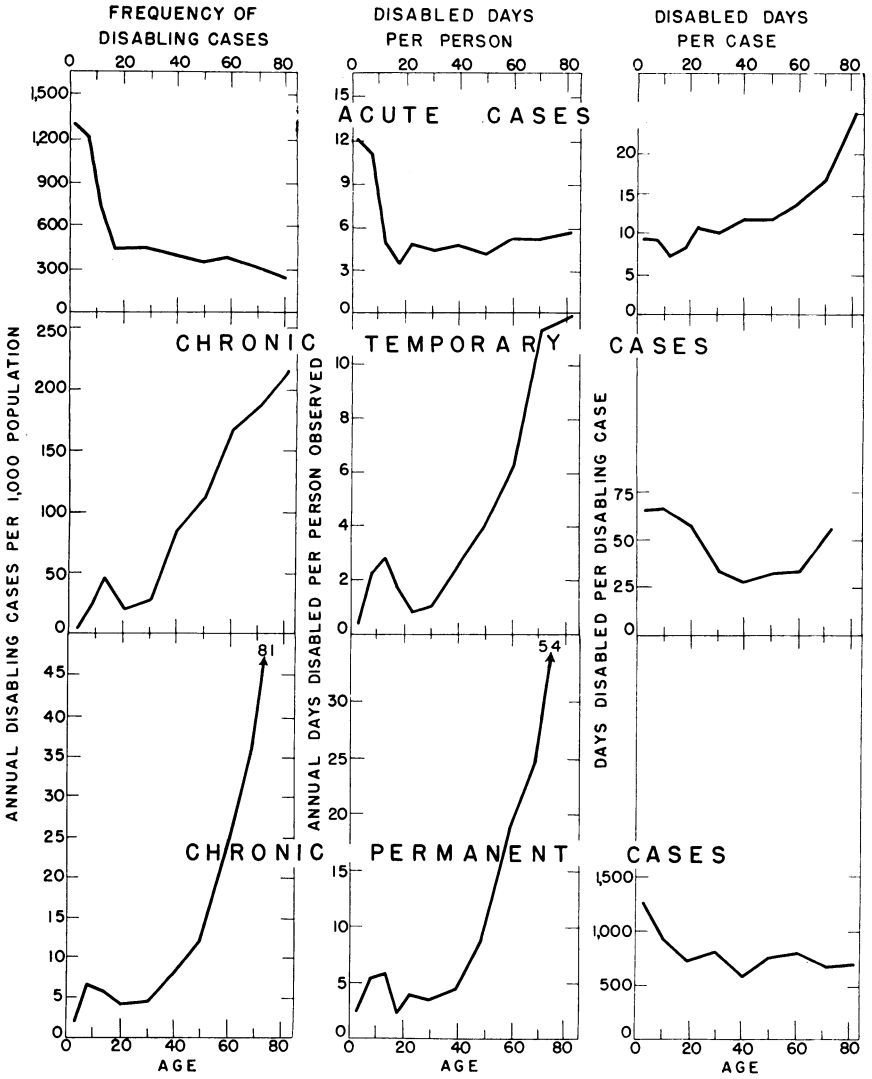

Figure 3. Age variation in rates of acute disability, chronic temporary disability, and chronic permanent disability as measured in cases and days—Eastern Health District of Baltimore, 1938–43.

serious chronic diseases, such as those of the heart and arteries, may cause relatively little disability but may end in a sudden and fatal attack (*1*).

Table 2 shows by age the case rates for each of the diseases shown in the charts.

The rate in the Baltimore Eastern Health District survey for all cases (disabling plus nondisabling) was higher than that found in most other surveys in which the Public Health Service has participated (*2*).

The highest total case rates occurred in the younger ages. Generally, the less serious the cases in terms of disability or time in bed, the greater the excess in the Baltimore survey rates over those found in other similar studies. Thus the more frequent interviews in Baltimore and perhaps the greater care to list all illness occurring in the family, apparently led to relatively greater increases in reports of the less serious types of illness than in reports of the more serious kinds.

The rates in the older ages are higher and a higher proportion of the cases are disabling; whether we use disabling or total cases, the rates for the specific chronic diseases are relatively high in the older ages.

In view of the finding in the Baltimore study that nondisabling cases constitute at least half of all cases of illness, it seemed worthwhile to set up age curves including all recorded cases of each specific diagnosis. In the acute communicable diseases, the mild cases and even the carriers, of which we have no record in this study, are important in the spread of disease. The minor noncommunicable diseases such as those included in this study are also of interest in view of the importance of early diagnosis.

The case rates for specific diagnoses are shown in figures 4, 5, 6, and 7. The age curves are so different, even for diagnoses within rather homogeneous groups such as the minor respiratory diseases, that they are shown here in as much detail as possible. The side scales on these charts represent actual annual case rates but they are so arranged that the average rate for all ages plots at the same distance from the base line for every disease. Thus, the curves are on a relative basis even though the vertical scales show actual rates.

Figures 4–7 readily show that the incidence of many diseases varies with age a great deal more than does the incidence of all causes combined. Since illness from all causes is the sum of the individual causes, this would be expected; nevertheless, it is a reminder of how little knowledge can be obtained about illness when the diagnosis or cause of the condition is not taken into account.

The respiratory diseases and some of the allergies occur very frequently in the ages under 15, and tend to decline as age increases (fig. 4). With a few exceptions the rates for the ages under 5 years are strikingly high. Rates for tonsillectomy and dermatitis venenata (plant poisoning) reach their peaks at 5 to 14 years. Presumably, the reason for the delayed peak in tonsillectomy is the general feeling in the medical profession that it is unwise to remove tonsils at too early an age. The peak for plant poisoning may depend partly upon the character of the neighborhood; in places where poison ivy and other poision plants are common, the peak incidence may be at earlier ages than in areas with fewer poison plants.

Figure 5 shows the digestive diseases and some of the chronic

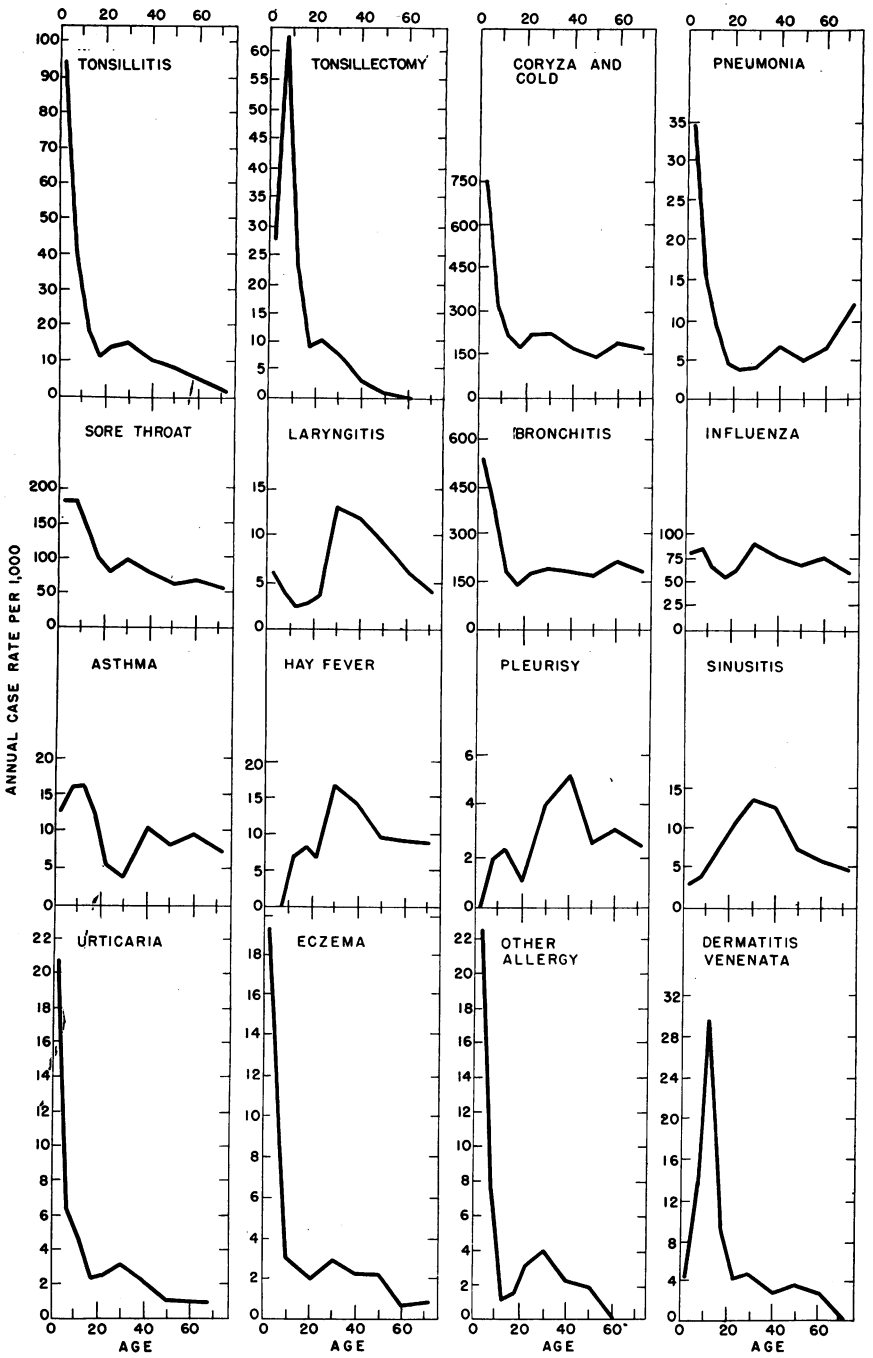

Figure 4. Age variation in total case rates (disabling and nondisabling) from specific causes—Eastern Health District of Baltimore, 1938–43.

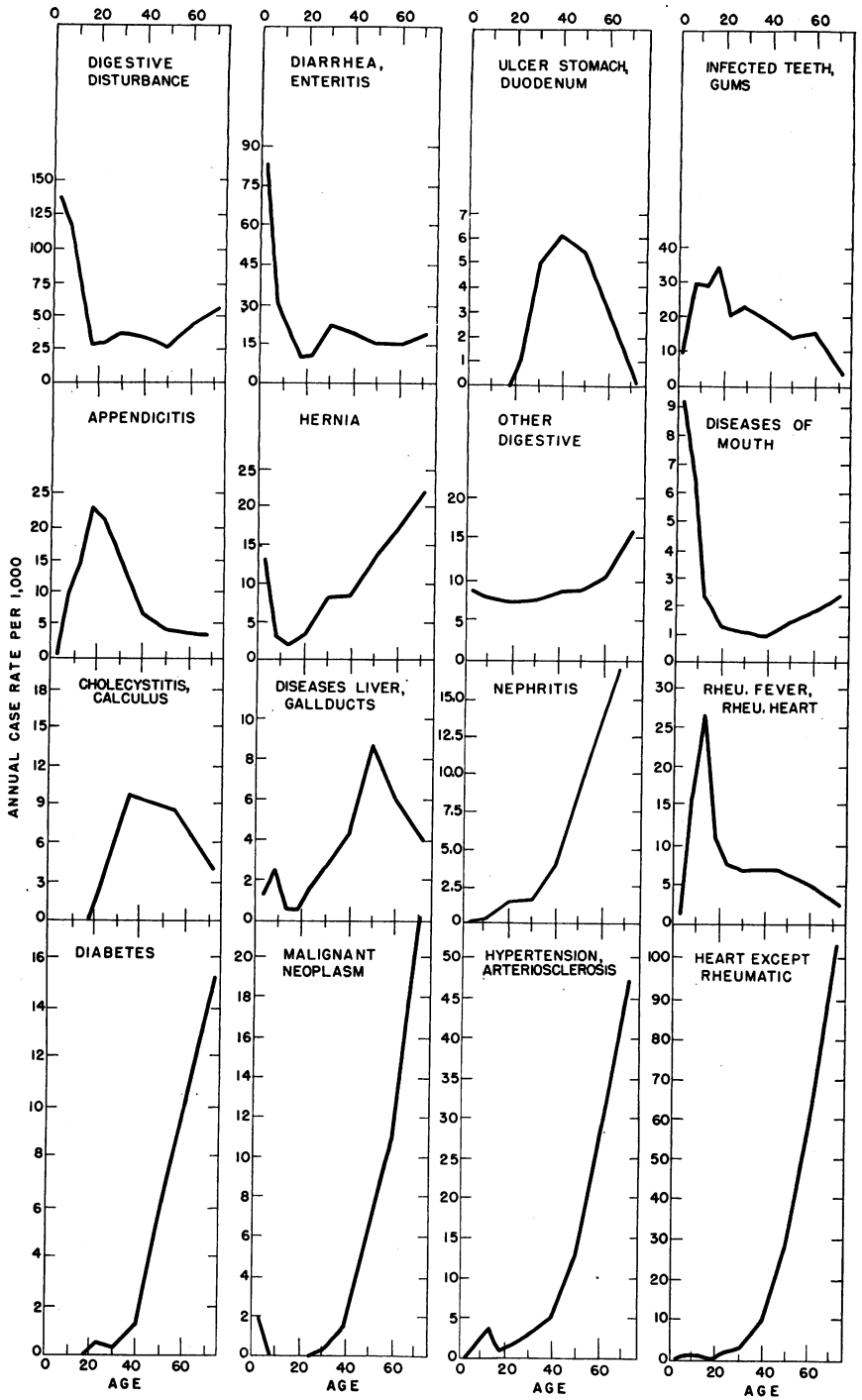

Figure 5. Age variation in total case rates (disabling and nondisabling) from specific causes—Eastern Health District of Baltimore, 1938–43.

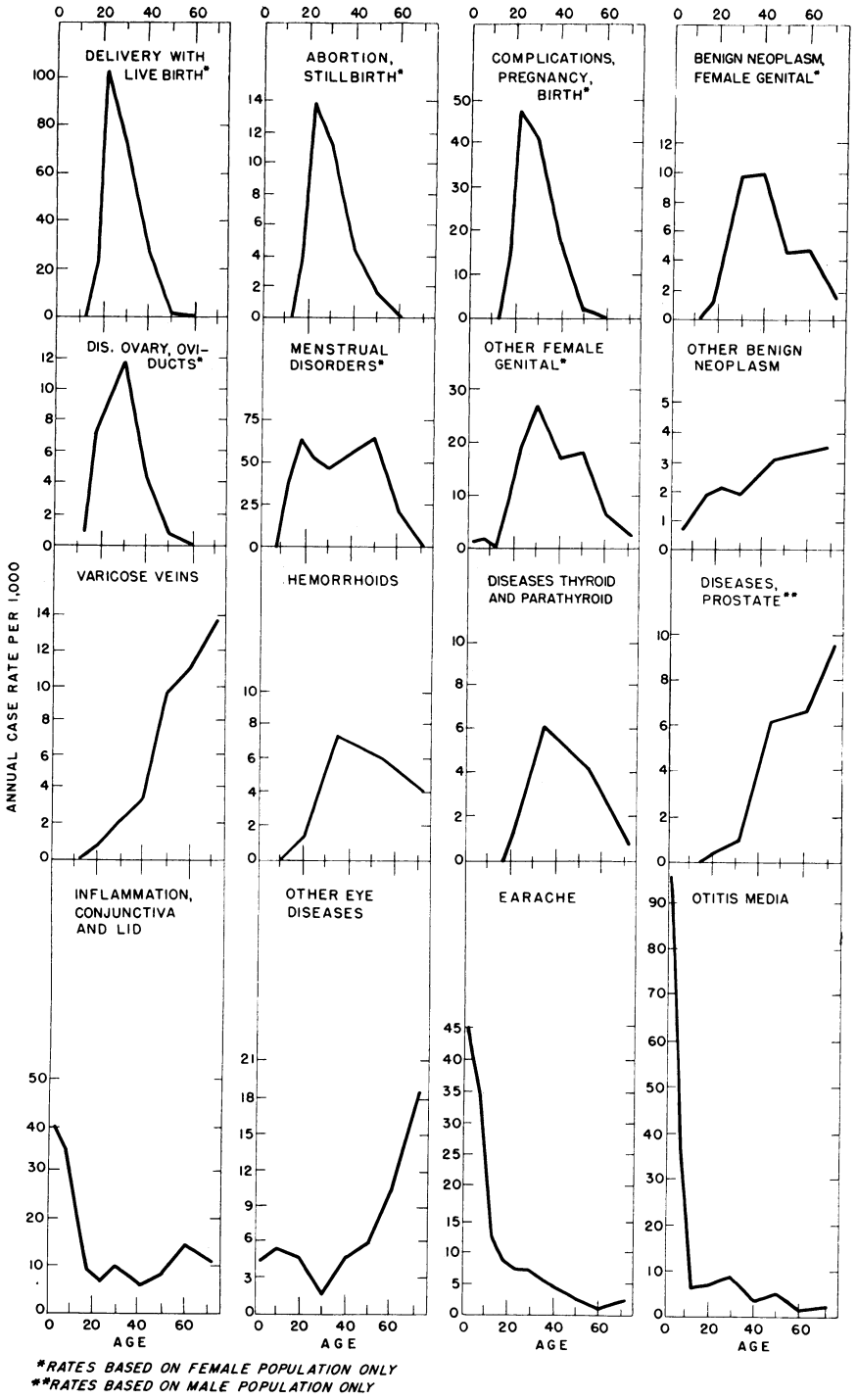

Figure 6. Age variation in total case rates (disabling and nondisabling) from specific causes—Eastern Health District of Baltimore, 1938–43.

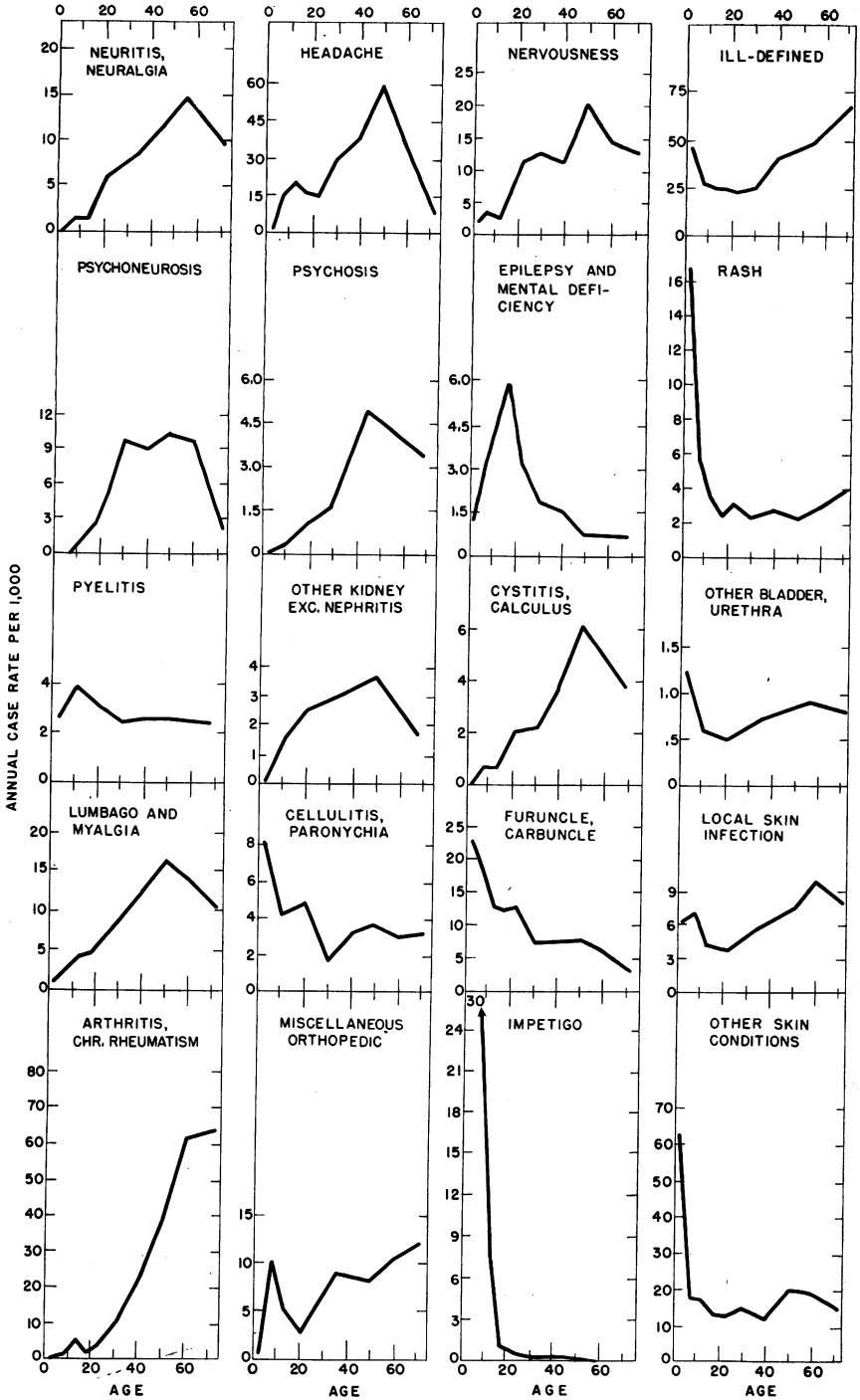

Figure 7. Age variation in total case rates (disabling and nondisabling) from specific causes—Eastern Health District of Baltimore, 1938–43.

diseases. As would be expected, the chronic disease rates are generally low in the younger ages and are successively higher as age increases. The minor digestive diseases, such as digestive disturbances and diarrhea and enteritis, again tend to be high in childhood, but peptic ulcer, appendicitis, and cholecystitis are high among young and middle-aged adults; low rates prevail for both children and the aged.

The upper half of figure 6 pertains to diseases of pregnancy, childbirth, and the puerperal state, and to diseases of the female genital organs. These rates are based on the total female population (married and single). As would be expected, the female genital as well as the puerperal conditions are confined largely to the childbearing ages. Tumors and cysts of the female genital organs are listed in table 2 along with other benign and malignant tumors.

In considering the rather high rates for the complications of pregnancy, childbirth, and the puerperium, it should be remembered that more than one such attack may occur during pregnancy and more than one during the puerperium. Thus, a rate half as large as the birth rate does not necessarily mean that half the women had one or more of these complications.

In the lower part of figure 6 are the various diseases of the eye and ear, including inflammatory diseases, which show the highest rates in the youngest ages. The diseases of the eye are a good example of the necessity for considering specific diagnoses rather than broad groups; conjunctivitis and inflammation of the lid is much more common in the ages under 5 years, but miscellaneous other eye diseases are highest in the oldest ages.

Figure 7 contains a miscellaneous group of diseases including mental and nervous conditions. Evidence from other sources indicates that institutionalized cases of psychosis increase with age, the highest rates occurring in the oldest ages (*3*, *6*, *7*, *8*). However, in this study the psychosis rates increase up to 40 or 50 years of age and then decrease. This may be a chance fluctuation due to the small numbers of cases, or it may reflect the inability to obtain a record by house-to-house canvass for patients of the older ages who may have been in mental hospitals for many years. In the childhood and early adult ages, the records are presumably more complete because each housewife was asked about the residence of all children of the household head whether present in the household or living elsewhere. This question identified the children of the household head who were in mental institutions but did not obtain the same information on brothers, sisters, and parents of household heads who may have been in institutions for such long periods that they had ceased to be considered as members of the family.

The middle part of figure 7 shows various other diseases including kidney, bladder, skin, and orthopedic conditions. The most frequent

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Table 2. Annual case rates [1] per 1,000 white persons of specific ages canvassed at monthly intervals in a sample of the Eastern Health District of Baltimore, 1938–43

[Sole, primary, and contributory causes [2] total cases including both disabling and nondisabling]

Diagnoses with code numbers [3]	All ages		Age									
	Number of cases	Rate	Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
Minor respiratory diseases:												
Influenza and grippe (430)	1,550	72.08	79.62	82.60	63.00	54.55	61.46	87.94	75.64	66.76	74.52	59.01
Bronchitis (471,479)	4,669	217.11	529.78	361.92	176.98	136.39	170.83	191.29	181.53	168.19	210.94	179.43
Coryza and cold (440)	5,165	240.18	746.71	329.76	210.19	175.84	217.19	220.78	171.76	143.01	191.71	173.05
Tonsillitis (460)	418	19.44	94.67	39.72	18.90	11.20	14.06	15.14	10.09	8.03	4.81	1.59
Sore throat (461, 466)	2,187	101.70	189.34	184.11	142.61	100.34	80.73	98.57	80.05	63.12	69.11	55.82
Laryngitis (467)	165	7.67	6.27	3.78	2.29	2.92	3.65	13.55	12.29	9.49	6.61	3.99
Other respiratory diseases:												
Sinusitis (495)	187	8.70	3.13	3.78	7.37		10.94	13.55	12.61	7.30	6.01	4.78
Pneumonia (481–489)	186	8.65	33.86	15.76	8.59	4.38	3.65	3.99	6.62	5.11	6.61	11.96
Pleurisy (490–493)	57	2.65	-------	1.89	2.29	1.01		3.99	5.04	2.55	3.00	2.39
Tonsillectomy (450)	262	12.18	27.59	63.68	22.91	8.77	9.90	7.70	2.84	.73	-------	-------
Allergy and related disorders:												
Asthma (501)	202	9.39	12.54	15.76	16.04	12.18	5.21	3.72	10.40	8.03	9.62	7.18
Hay fever (500)	200	9.30	-------	-------	6.87	8.28	6.77	16.47	13.87	9.49	9.01	8.77
Eczema (710)	74	3.44	19.44	3.00		1.76		2.92	2.21	2.19	.60	.80
Urticaria (714)	86	4.00	20.69	6.31	4.58	2.44	2.60	3.19	2.21	1.09	1.03	
Other allergy (791–793)	86	4.00	22.57	7.57	1.15	1.46	3.12	3.99	2.21	1.82	-------	-------
Dermatitis venenata (718)	152	7.07	4.39	13.87	30.93	9.25	4.17	4.78	2.84	3.65	3.00	-------
Infectious and parasitic diseases:												
Measles (013)	345	16.04	110.34	94.58	5.15	.97	1.41			----		
German measles (014)	346	16.09	45.77	88.90	53.84	13.15	1.23			.45		
Whooping cough (011)	184	8.56	80.88	30.90	1.15	-------	.35			.23		
Mumps (016)	90	4.19	14.42	32.79	5.15	-------	1.06			----		
Chickenpox (015)	196	9.11	56.43	61.79	2.29	-------	.70			----		
Scarlet fever (010)	30	1.40	2.51	8.83	4.01	.97	.53			----		
Tuberculosis (all forms) (020–039)	67	3.12	-------	-------	2.29	2.92	4.05			3.85		
Reaction to smallpox vaccination (790)	62	2.88	19.44	15.13	1.72	.49	.53			----		
Noninfectious general diseases:												
Malignant neoplasm (100–169)	72	3.35	1.88	-------	-------	-------	-------	.27	1.58	6.20	10.82	22.33
Benign neoplasm and cysts of female genital organs (170–179, 657, 667)	50	2.33	-------	-------	-------	.49	2.08	4.78	5.04	2.19	2.40	.80
Other benign neoplasm (181–199)	49	2.28	.94		1.84		2.08	1.86	3.04		3.43	
Diabetes (210–219)	59	2.74	-------	-------	-------	-------	.52	.27	1.26	6.20	10.22	15.15
Diseases of thyroid and parathyroid glands (220–232)	66	3.07	-------	-------	1.15	1.56		6.05		4.09		.80

See footnotes at end of table.

Table 2. Annual case rates [1] per 1,000 white persons of specific ages canvassed at monthly intervals in a sample of the Eastern Health District of Baltimore, 1938–43—Continued

Diagnoses with code numbers [3]	All ages		Age									
	Number of cases	Rate	Under 5	5–9	10–14	15–19	20–24	25–34	35–44	45–54	55–64	65 and over
Diseases of nervous system:												
Neuritis and neuralgia (316, 337, 784)	163	7.58	-------	1.26	1.15	5.79		8.51		14.76		9.57
Nervousness (786)	230	10.70	1.88	3.15	2.29	7.31	11.46	12.75	11.66	20.43	14.42	12.76
Psychoneurosis (330)	127	5.91	-------	-------	1.15	2.44	4.69	9.56	8.82	10.22	9.62	2.39
Epilepsy and mental deficiency (335–336)	50	2.33	1.25	4.20		5.85	3.12	1.86	1.58	.73	.69	
Psychosis (320–329)	50	2.33	-------	.30		1.01		1.59	4.90		3.43	
Diseases of eye and annexa:												
Inflammation of conjunctiva and eyelid (347)	307	14.28	39.50	34.68	21.76	9.25	6.77	10.10	5.99	8.76	14.42	11.16
Other eye diseases (340–346, 348–349)	120	5.58	4.39	5.40		4.53		1.59	4.73	5.84	10.22	18.34
Diseases of ear:												
Earache (351)	235	10.93	45.14	35.31	12.60	8.77	7.29	7.17	4.41	2.55	1.20	1.39
Otitis media (350)	319	14.83	97.18	37.20	6.30	7.05		8.77	3.78	5.47	1.80	2.39
Diseases of heart and circulatory system:												
Rheumatic fever, rheumatic heart (200–204, 360, 365)	185	8.60	1.25	15.76	26.35	10.72	7.29	6.64	6.76		4.81	2.39
Other heart diseases (370, 380–389)	369	17.16	.63	1.26	1.15	.49	2.60	3.19	9.77	28.46	63.10	104.47
Hypertension, arteriosclerosis (290–295, 307, 390, 399, 400)	183	8.51	-------	1.89	3.44	.97	1.56	2.92	5.04	12.77	28.85	47.05
Varicose veins (410–414)	83	3.86	-------	-------	-------	.76		2.13	3.47	9.49	10.82	13.56
Hemorrhoids (415)	.86	4.00	-------	-------	-------	.49	2.08	5.31	7.44		5.83	
Minor digestive diseases:												
Digestive disturbance (560–570)	1,113	51.76	138.56	117.91	71.02	28.74	29.69	37.73	33.41	26.63	43.87	56.62
Diarrhea and enteritis (009, 530–539)	565	26.27	132.29	30.26	19.47	9.25	10.42	22.05	18.91	14.96	15.02	19.14
Other digestive diseases:												
Infected teeth and gums (510)	437	20.32	9.40	30.26	29.21	35.07	20.31	22.58	18.59	13.86	15.62	3.19
Diseases of mouth (514–517)	52	2.42	10.03	6.31	2.29	1.26		1.06	.95	1.46	1.80	2.39
Ulcer of stomach and duodenum (520–527)	61	2.84	-------	-------	-------	-------	1.04	5.05	6.30	5.47	3.00	-------
Appendicitis (540–549)	226	10.51	.63	10.09	14.32	22.89	20.83	14.61	6.30	4.38	3.43	
Hernia (550–559)	117	5.44	8.15	1.89	1.15	2.01		5.05	5.04	8.03	10.22	13.56
Cholecystitis and calculus (585–586)	116	5.39	-------	-------	-------	2.60		9.80		8.63		3.99K
Diseases of liver and gallducts (580–584, 587–589)	74	3.44	1.25	2.52	.57	.49	1.56	2.66	4.41	8.76	6.01	3.99
Other digestive (519, 529, 572–579, 590–599)	180	8.37	8.15	7.57	7.45	7.05		7.44	8.19	8.39	10.22	15.95
Diseases of kidney and urinary system:												
Nephritis (375, 600–607)	98	4.56	-------	.30		1.51		1.59	3.78	8.76	16.79	
Pyelitis (610)	60	2.79	2.15	3.90		3.02		2.39	2.52	2.55	2.40	
Other kidney diseases (612, 617)	51	2.37	-------	1.50		2.52		3.03		3.65	1.71	
Cystitis and calculus (619–621)	58	2.70	-------	.63	.57	2.01		2.13	3.78	6.20	3.77	
Other diseases of bladder and urethra (623–629)	16	.74	1.25	.60		.50		.72		.91		.80

Male genital diseases (nonvenereal): [4]												
Diseases of prostate (630–639)	31	2.92				.51		1.06	6.12		6.47	9.49
Female genital and breast diseases (nonvenereal) except tumors and cysts: [5]												
Diseases of ovaries, oviducts, and parametrium (650)	47	4.32			1.14	6.92	9.02	11.70	4.31	.74		
Menstrual disorders (663–664)	439	40.35			39.91	64.23	54.11	46.28	55.35	65.38	22.45	
Other female genital (652–656, 658–661, 666, 668–669)	137	12.59	1.27	1.36		7.91	18.04	26.60	16.61	17.83	6.73	2.75
Puerperal state: [5]												
Abortions and stillbirths (674–677, 694–695)	48	4.41				3.95	14.03	11.17	4.31	1.49		
Live births (670–673)	324	29.78				23.72	107.21	77.13	28.91	.74		
Complications of pregnancy, childbirth (680–689, 692–693, 696, 699)	167	15.35				13.83	47.09	40.43	16.61	2.23		
Diseases of skin:												
Furuncle and carbuncle (700)	224	10.42	22.57	18.92	12.60	12.18	12.50	7.44	7.56	7.66	6.01	3.19
Cellulitis and paronychia (702, 704)	81	3.77	8.15	4.20		4.78		1.59	3.15	3.65	3.00	3.19
Impetigo (711)	107	4.98	30.09	25.22	7.45	.99	.52	.27	.32	.36		
Other local skin infection (706)	125	5.81	6.27	6.31	3.44	3.90	3.65	5.48		7.30	9.62	7.97
Other skin conditions (713, 715–716, 719)	411	19.11	63.32	17.65	17.18	13.15	13.02	14.61	11.98	20.43	19.23	15.15
Diseases of bones, joints and organs of locomotion:												
Arthritis and chronic rheumatism (720–729, 783)	416	19.34		1.26	5.15	1.46	3.65	9.56	22.06	38.67	61.90	63.80
Lumbago and myalgia (740, 782)	186	8.65	1.25	2.52	4.01	4.38	6.25	8.77	12.29	16.05	13.82	10.37
Miscellaneous orthopedic conditions (730–739, 742–749)	152	7.07	.63	10.09	5.15	2.77		8.79		8.03	10.22	11.96
Other and ill-defined diseases:												
Headache (785)	601	27.95	1.25	15.76	20.05	16.07	14.58	28.96	42.86	59.47	36.06	7.97
Rash	87	4.05	16.93	5.67	3.44	2.44	3.13	2.39	2.84	2.19	3.00	3.99
Other and ill-defined (781, 789, 797–799)	783	36.41	47.02	27.11	25.20	24.35	22.40	24.97	40.66	49.49		69.38
Number of full-time person-years of life observed (whole study)	21,505		1,595	1,586	1,746	2,053	1,920	3,764	3,173	2,741	1,664	1,254

[1] Rates per 1,000 in this table are computed with 2 decimal places for convenience in making further computations based on the rates even when the last digit is not significant. The total number of cases for each diagnosis is given in the first column and the populations for each age are at the bottom of the table in terms of full-time person-years of life.

[2] In this table each diagnosis includes all cases of the given disease whether they are the sole, primary, or contributory cause of the illness. Thus the sum of all cases in this table may be more than the total in table 1 which includes only sole or primary causes. For chronic diseases each disabling attack or episode (continuous period of disability) is counted as a separate case and cases not disabled at any time during the period of observation are counted as one case only. All ages includes a few of unknown age.

[3] Diagnosis code numbers as given in A Manual for Coding Causes of Illness, Public Health Service Miscellaneous Publication No. 32, U. S. Government Printing Office, Washington, 1944. This table includes selected specific causes rather than every cause that appeared in table 6 of a preceding report (*2*). Some diagnoses with insufficient cases for an age curve are omitted but some are combined with other similar diagnoses.

[4] Rates based on male population only.

[5] Rates based on female population only. All other rates, including tumors and cysts of the female genital organs, are based on the total population of both sexes.

of the specific diagnoses is arthritis and chronic rheumatism, the case rate of which rises rapidly after 20 years of age to at least 65 years. The various skin diseases are generally high in the youngest ages and have a tendency to decline as age increases.

The common communicable diseases of childhood are not shown in the charts. The large frequencies of these diseases are so greatly confined to the ages under 15 years that narrower age groups are needed to show their age patterns. In a large city like Baltimore the frequencies are particularly high in the young ages. Thus, the highest rates for whooping cough and measles are in the ages under 5 years; rates for German measles, mumps, and scarlet fever are 2 to 4 times as high at 5–9 years as in the ages under 5. Chickenpox is also slightly higher at 5–9 than in the earlier ages. At 15–24 years, 4 of the 6 diseases have annual rates of less than 1 case per 1,000 persons observed; measles has 1.5 and German measles about 7. Even for a 5-year period one cannot say that the actual rates are expected average rates for these diseases which have wide epidemic fluctuations from year to year.

Summary

Data from a 5-year study of sickness in a sample of the Eastern Health District of Baltimore reveal the following relationships to the age of the individual.

In terms of cases, acute illnesses are important, particularly in the younger ages. Case rates for chronic diseases are overshadowed by the much larger numbers of acute cases (fig. 2).

In terms of days of disability (inability of the patient to be about his or her usual duties) per person under observation (sick and well), the chronic diseases are the overwhelming factor in the total sickness picture of days lost from work or other usual duties. This situation results from the long durations of disability per chronic disabling case. The durations of the few chronic cases in the younger ages are also long, but the numbers of such cases are few (fig. 3).

The heavy load of disability from all causes per person under observation (sick and well) in the older ages is largely due to change in the kind of diseases that attack older people, rather than to longer durations of diseases similar to those frequent among younger people.

Prevalence of illness from all causes shows about the same relative age picture as days of disability per person observed; this is necessarily true because prevalence represents a sample of the days of sickness related to the total persons observed (fig. 1).

The age selection of the different specific diagnoses varies so widely that any broad group as well as all illness combined represents a crude average of widely varying data for specific diagnoses (figs. 4, 5, 6, and 7).

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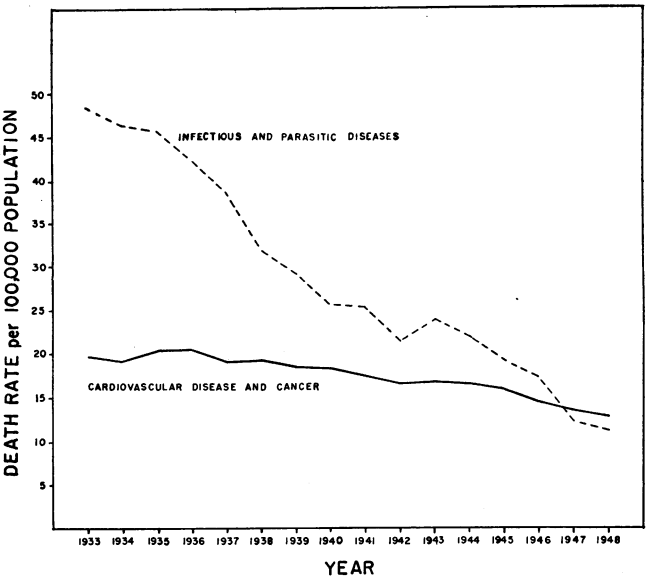
Changing Causes of Death in Childhood

By Harold A. Kahn*

The so-called degenerative conditions—cardiovascular disease and cancer—now cause more deaths among children of school age in the United States than all the infectious and parasitic diseases combined.

The array of infectious diseases frequently referred to as "childhood diseases" has in the past been associated with the young age group in various ways. They occurred more frequently than other diseases within the young group, and they were generally concentrated in this group rather than in other ages. In addition, these relationships were true for mortality as well as sickness measurements.

Within recent years, the long-term trend of decreased mortality from infectious diseases has resulted in a change in one of the above associations. The infectious diseases are no longer more frequent than other diseases as a cause of death among school-age children.



Source: National Office of Vital Statistics: Vital Statistics of U. S., 1933-1948,

Death rates from selected causes per 100,000 population, United States 1933–48, age 5–19.

*Statistician, Biometrics Research Section, National Heart Institute, National Institutes of Health, Public Health Service.

In 1948, cardiovascular disease and cancer deaths totaled 4,514 in the 5 to 19 age group, while the infectious and parasitic diseases accounted for 3,990 deaths in the same age group.

Table 1 and the accompanying graph show how this situation has developed during the past 15 years. Table 2 presents the more detailed components of each of these broad categories for 1948.

Table 1. *Number of deaths from selected causes and rates per 100,000 population, United States 1933–1948, age 5–19*

Year	Number of deaths		Rate per 100,000 population	
	Infectious and parasitic [1]	Cardiovascular and cancer [2]	Infectious and parasitic [1]	Cardiovascular and cancer [2]
1933	17,449	7,153	48.2	19.8
1934	16,767	6,958	46.4	19.3
1935	16,441	7,340	45.6	20.4
1936	15,141	7,368	42.2	20.5
1937	13,682	6,813	38.4	19.1
1938	11,328	6,881	32.0	19.5
1939	10,247	6,569	29.3	18.8
1940	8,903	6,465	25.7	18.6
1941	8,764	6,064	25.5	17.6
1942	7,375	5,664	21.7	16.6
1943	8,121	5,686	24.1	16.9
1944	7,397	5,512	22.3	16.6
1945	6,333	5,269	19.3	16.1
1946	5,860	4,818	17.6	14.5
1947	4,150	4,599	12.3	13.6
1948	3,990	4,514	11.5	13.0

[1] Section I of the International List of Causes of Death, Fourth and Fifth Revisions.
[2] Categories included are those which are most comparable to the following codes in the Sixth Revision of the International List of Diseases and Causes of Death; 330–334 (vascular lesions affecting C. N. S.), 400–468 (diseases of the circulatory system), and 140–205 (malignant neoplasms including neoplasms of lymphatic and hematopoietic tissues).

SOURCE: National Office of Vital Statistics: Vital Statistics of U. S., 1933-1948.

Table 2. *Number of deaths from selected causes, United States 1948, age 5–19*

Infectious and parasitic		Cardiovascular and cancer	
Tuberculosis (all forms)	1,688	Chronic rheumatic heart disease	985
Poliomyelitis and polioencephalitis	866	Other diseases of the heart	678
Measles	240	Acute rheumatic fever	390
Influenza	177	Vascular lesions affecting the central nervous system	327
Diphtheria	171	Other circulatory disease	103
Cerebrospinal meningitis (meningococcus)	151	Sub-total cardiovascular	2,483
Tetanus	127	Leukemia and aleukemia	789
Syphilis	65	Cancer of the central nervous system	348
Typhoid fever	41	Cancer of the digestive organs and peritoneum	149
Septicemia	40	Cancer of the urinary organs	81
Acute infectious encephalitis	39	Cancer of the respiratory system	78
Dysentery	34	Cancer of the uterus and other female genital organs	67
Scarlet fever	31	Cancer of the buccal cavity and pharynx	30
Typhus fever	30	Cancer of the male genital organs	26
Whooping cough	29	Cancer of the skin	14
All other	261	All other and unspecified cancer	449
Total	3,990	Subtotal cancer	2,031
		Total	4,514

SOURCE: National Office of Vital Statistics: Vital Statistics of U. S., 1947.

Coronary Occlusion With Myocardial Infarction in Young Males

—Report of Four Cases—

By Tracy Levy, M. D.*

Coronary artery disease can and does occur at any age. There is even a pathological condition that occurs in infants which produces a physiological condition similar to arteriosclerotic coronary artery disease. One must always keep in mind that, even though coronary artery disease is usually considered statistically an entity of the fifth, sixth, or seventh decades of life, substernal oppression, precordial pain, and angina of exertion must be investigated cardiologically in all age groups. In the literature, numerous reports are found of sudden deaths in the younger age groups of World War II personnel in which autopsy revealed advanced coronary sclerosis with occlusion of vessels with or without myocardial infarction.

Nichols (*1*) reports that the ratio percentage of coronary deaths to total deaths at the various ages increases to a maximum of 11.2 percent at age 60–64 years, and then consistently diminishes. In the higher age groups, death results in increasing numbers and proportions from noncoronary causes. The female death rate from coronary artery disease is consistently much less than that of males in all the race classes—in the aggregate, less than one-half. The rates are also much lower in the Negro and other races than in the white.

CASE REPORTS

Case 1. DPR No. 36 870. This 30-year-old white male was admitted to the Veterans Administration Hospital, Tuscaloosa, Ala., June 9, 1949, with the chief complaint of "severe pain in the chest." There was no history of previous or similar attack. The onset of the illness began rather acutely with dull pain, like indigestion, and was more or less limited to the epigastrium and substernal regions. The pain was dull and aching in character, as if something were pressing on the chest. He took some soda, but this gave him no relief. Soon afterwards he began to vomit. He was immediately taken to his private physician and was given an injection and some medicine for pain. He returned home and said that the pain was relieved to some extent by the medicine, but as the medicine "wore off" the pain returned, still dull and aching in the substernal and epigastric regions There was no history of shortness of breath He noted that on taking a deep breath he had severe pain in the upper epigastrium on the left side and across the left substernal region. He also noticed that he had pain on turning on to the left side.

*S. A. Surgeon, Public Health Service Out-patient Clinic, Washington, D. C.

Since he failed to improve, he was admitted, first to the Druid City Hospital, Tuscaloosa, and then to this hospital. The pain persisted and was relieved only by narcotics.

Past history revealed that the patient, while in service, was hospitalized once for "frozen feet," once for "shrapnel wound of the right leg," and once for "kidney trouble."

Physical examination revealed that he was well developed and fairly well nourished. He appeared acutely ill and in some pain. There was no dyspnea or orthopnea. On palpation of the chest, tactile fremitus was transmitted normally, the percussion note was resonant throughout, and the bases moved freely on deep inspiration. On auscultation, there were many fine, crackling rales in both bases, laterally and posteriorly. Blood pressure was 90/60 mm. of mercury in both arms; pulse was 98; and the temperature was 99° F. The heart was within normal limits on palpation and percussion. The first sound was of poor muscular quality and somewhat muffled; rhythm was regular, and no murmurs were heard over any of the valvular areas. There were multiple small scars over the right shin, top of the right foot, dorsum of the left foot, left knee, and thigh as result of shrapnel wounds incurred in service. There was also a chronic eczematoid dermatitis on the feet. The remainder of the physical examination was within normal limits.

X-ray of the chest on admission revealed no significant pulmonary or cardiac pathology. Reexamination 4 days later was still negative. Complete blood count on admission was within normal limits except for elevated white cell count. Sedimentation rate was 18 mm. (Cutler) in 1 hour. Complete blood count on June 13 showed some diminution in the white cells and the sedimentation rate remained 18 mm. Repeated complete blood count on June 20 showed the white cell count to be elevated again, and the sedimentation rate was 25 mm. At the time of discharge the sedimentation rate was still slightly elevated, and there was still a slight leukocytosis. Urinalysis was normal. Cholesterol was 250 mg. percent. Feces was negative for ova and parasites. The admission electrocardiogram showed changes indicative of an acute anterior coronary occlusion with myocardial infarction. Repeated electrocardiograms indicated progressive healing of the myocardial lesion. Follow-up electrocardiograms exhibited the residuals of a healed anterior myocardium (fig. 1).

While in the hospital the patient was given heparin intramuscularly, 50 mg. every 6 hours for 8 doses and large doses of Dicumarol concomitantly. The initial dose of Dicumarol was 300 mg.; this was followed, in 24 hours, by 200 mg. The dose was then determined daily by the prothrombin activity. He was put on absolute bed rest. After 4 weeks' bed rest, during which time he was given passive exercises, he was started on gradually increasing active exercise. Dicumarol was then discontinued. He improved gradually and his strength slowly returned. There was no evidence of congestive failure. However, it was noted that moderate amounts of exercise caused angina and slight dyspnea.

Case 2. CSH No. 37 120. This 25-year-old white male was admitted to the same hospital on July 26, 1949, with the chief complaint of "pain in the chest." There was no history of indigestion, pain in the chest, or shortness of breath. The onset of the present illness began rather acutely about noon July 26, 1949, before lunch. The onset was with acute pain in the epigastrium, which lasted 5 or 10 minutes; the pain was sharp and continuous. There was nausea and cold sweat but no shortness of breath. When he sat down, he got some relief; the pain recurred when he walked. The pain was more or less evenly distributed to the right and left of the sternum in the midchest. The pain, as it spread into the chest, was dull and aching; there was no feeling, as if there were pressure in the

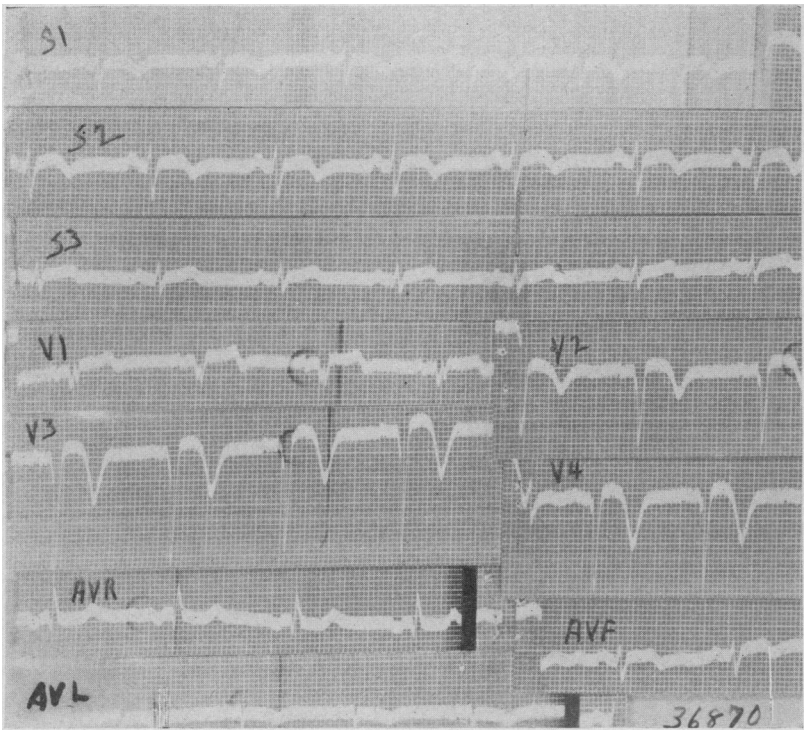


Figure 1. Electrocardiogram of case 1 showing typical changes in S 1 and S 2 and V leads.

chest. He called a physician and was given 100 mg. of Demerol. This relieved him markedly. The past history and review of systems were essentially noncontributory.

Physical examination on admission revealed that he was well developed and well nourished, and did not appear acutely ill. The head and neck were normal. Chest findings were normal except for evidence of a well-healed fracture of the middle of the left clavicle. Lungs were clear to palpation, percussion, and auscultation. Blood pressure was 120/80 mm. of mercury; pulse, 82 per minute. The heart did not appear enlarged and no thrills or murmurs were noted. The remainder of the physical examination was within normal limits.

Serology and urinalysis were normal. Complete blood count revealed a normal red blood cell count with a slight leukocytosis. Sedimentation rate (Cutler) was 12 mm. in 1 hour; bleeding and coagulation times were within normal limits. The leukocytosis gradually decreased, and the patient never showed any abnormal elevation of the sedimentation rate. Chest X-ray was negative. Cardiac fluoroscopy was within normal limits. The admission electrocardiogram revealed findings characteristic of an anterior coronary occlusion with myocardial infarction. Subsequent electrocardiograms indicated changes consistent with normal healing of the anterior myocardial infarct (fig. 2).

As soon as the diagnosis of coronary occlusion was established, he was placed on Heparin and Dicumarol concomitantly in the same manner as the previous case and maintained on Dicumarol until active exercise was started. The patient made an entirely uneventful recovery, was up and about by the end of August, and was discharged after 6 weeks hospitalization.

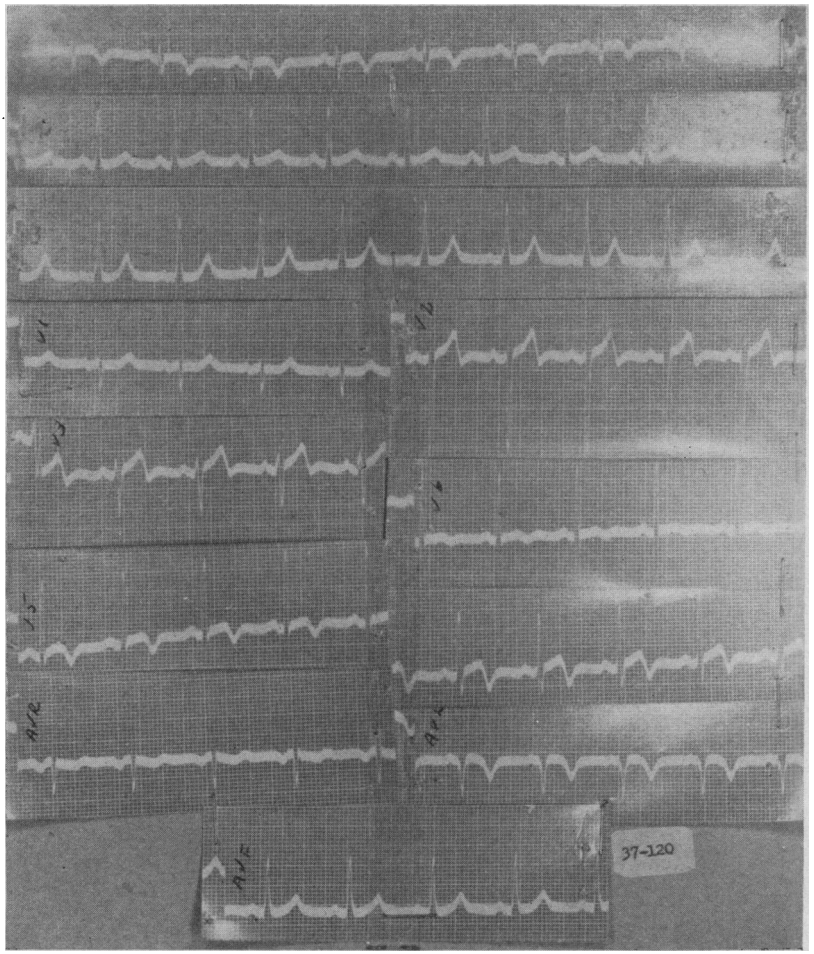


Figure 2. Electrocardiogram of case 2 showing the typical changes found in a recent anterior myocardial infarct.

Case 3. GA No. 41 015. This 33-year-old physician was admitted to Providence Hospital, Washington, D. C., July 10, 1950. His chief complaint was substernal oppression and a sensation of weight in this region. The onset was rather abrupt the morning of July 9, 1950. After some 20 minutes, the acute pain subsided and a "nagging" pain remained for some 24 hours. This "nagging" sensation was also present in both forearms for the same period of time.

Physical examination revealed that he was well developed and well nourished. The pulse was 82 per minute and the blood pressure, 120/85 mm. of mercury in both arms. A sinus arrhythmia was present. The electrocardiogram on admission was consistent with occlusion of the posterior coronary vessel with myocardial infarction. The sedimentation rate, white blood count, and differential count were within normal limits.

He was treated with anticoagulants (same dosage as cases 1 and 2) and bed rest for 4 weeks. His recovery was uneventful.

Case 4. WWA. This 32-year-old painter, white, seen in the out-patient clinic, complained of severe pain in the middle of his chest. He was short of breath and very anxious. There was no history of similar attacks. He had been painting on the outside of a building prior to the onset of the illness.

Physical examination revealed acute illness. He was pale and perspiring profusely. The pulse was 102 per minute and was weak and thready. The blood pressure was 90/60 mm. of mercury in both arms. The heart sounds were distant; the rhythm was regular. There were a few crackling rales in both lung bases posteriorly. The remainder of the physical examination was within normal limits. The electrocardiogram showed changes indicative of an acute anterior coronary occlusion and myocardial infarction.

He was treated with bed rest and the anticoagulant regime as previously described. He made an uneventful recovery.

Review of the Literature

Coronary artery disease in the younger adult age groups cannot be classified as rare. The table shows the number of cases occurring in the first four decades. The incidence increases thereafter.

Weinberg, Ochs, and Chesnicks (*3*) found 16 cases of myocardial infarction in the age group 25–35 years. All were males, 2 were Negroes.

French and Dock (*4*) at the Army Medical Museum reviewed 80 cases of coronary deaths in the age group 20–26. Seventy-three (91 percent) were overweight. Arteriosclerosis was the basic lesion in all instances.

Tullis (*5*) (quoting Connor and Holt), on reviewing 287 case reports of patients of all ages, noted that 1 percent had their initial attack before the age of 30. Masters and his associates (quoted by Tullis) found that 2 percent of 500 patients of all ages had their initial attack before the age of 30. Newman (*2*) collected 50 cases from the records of service men and women under 40 years of age where coronary occlusion was found at necropsy, or where the electrocardiogram supported the clinical diagnosis. The ages ranged from 20–35; 22 of the patients were in their twenties. He found all the patients were of good physical development; previous infection might have been of etiological importance in only a few; in more than half the cases there was no evidence of physical strain. He noted that sudden death took place in 33 out of 39 fatal cases. At necropsy, 37 out of the 39 fatal cases showed the usual degenerative atheromatous changes found in coronary disease of older subjects, and in 29 there was no thrombus. Richards (*6*) reported a case of coronary thrombosis with myocardial infarction in a 19-year-old white male. Severe coronary atheromatosis was present with medial cystic degeneration, marked general arteriosclerosis, and multiple renal infarcts.

Steigman and Glassner (*7*) found acute myocardial infarction in three young individuals. Poe (*8*) reported on 280 cases, 121 of which died of natural causes. In 7.4 percent, autopsy indicated that disease

of the coronary arteries was the cause of death. He found that evidence of fresh infarction is rare in young men dying of coronary artery disease. Nay (*9*) reported 6 cases occurring among soldiers; their ages were 25, 30, 30, 31, 37, and 38. None of the patients was known to have had hypertension previous to myocardial infarction. In none of the patients was there evidence of peripheral vascular disease. Glendy, Levine, and White (quoted by Nay), in a group of 3,376 cases of myocardial infarction, found 1.54 percent in individuals under 40 years of age. Nichols (*1*) found in the 25–29 age group that the ratio of coronary deaths to total deaths (in 1940) was 1.1 percent; in the 30–34-year-old group it was 2.2 percent.

Coronary occlusion by 10-year age groups from 0 to 40 years

Author	Age group			
	0–10 years	10–20 years	20–30 years	30–40 years
Tullis (quoting various authors)		9	77	370
Nay		1	4	
Poe			3	6
Stiegman and Glassner			1	2
Scott and Miller	3			
Richards		1		
Newman			30	129
Nichols [1]	41	81	465	2,531

[1] Statistics from the entire United States in 1940 from Vital Statistics of the United States.

Minkowsk (*10*), following the work by W. Dock, studied the coronary arteries of 51 males and 25 females less than 1 day old who had died of birth trauma and/or asphyxia. He found that coronary intimal thickening may be expected to occur in a large number of newborn infants dying of various causes, and the mean difference in coronary intimal thickness between male and female is strongly suggestive if not actually significant. He also noted the role of acute infections appears to be an important one in producing intimal thickenings in older infants and children. Plotz (*11*) concluded that the most important disease of the coronary arteries is atheromata. Ninety to ninety-five percent of all cases of myocardial infarction result from changes in and around an atheromatous plaque. He found that the absence of one coronary artery is compatible with long life. In 26 patients, death could be related to this anomaly in only 6; in 4, there was myocardial infarction.

Narrowing of the coronary arteries is found rather frequently in patients with syphilitic aortitis (about 20 percent). However, myocardial infarction secondary to the stenosis occurred in only 7.5 percent of cases in which narrowing was present. Syphilitic and arteriosclerotic involvement of the same coronary artery is common.

There is little doubt that infection plays a role in the pathogenesis

of acceleration of arteriosclerotic changes. This may be primary or by extension from neighboring tissues. Tuberculosis rarely involves the coronary arteries. Rheumatic fever rarely causes significant occlusion of a main coronary artery in spite of the diffuse and necrotizing lesions that occur in the media. In polyarteritis nodosa, the coronary vessels are involved about 70 percent of the time. Secondary only to the renal arteries, the coronary vessels are the most frequently damaged by this disease. Thromboangiitis obliterans has also been found as a cause of coronary occlusion.

Scott and Miller (*12*) note that Hughes and Perry (1929) report coronary thrombosis in an infant 7 weeks of age; and Ramsey and Crumrine (1931) reported coronary thrombosis in an infant 4 months old. Scott and Miller reported a case in an 11-month-old infant. The lesions found were not unlike periarteritis nodosa, but the changes in the vessel walls and the thrombosis were more suggestive of thromboarteritis obliterans.

Stryker (*13*) states the lesions which may produce partial or complete occlusion include:

1. Medial calcification with fibroblastic proliferation of the intima.
2. Periarteritis nodosa.
3. Arteriosclerosis (atherosclerosis).
4. Syphilitic arteritis.
5. Embolism.
6. Congenital abnormalities.
7. Rheumatic arteritis.
8. Hypertension.

Stryker found that 15 cases, 8 girls and 7 boys, of medial calcification with fibroblastic proliferation of the intima have been reported in ages 1 day to 27 months. The youngest case of arteriosclerotic coronary disease reported occurred in a boy 10 years old.

It is not in the scope of this article to discuss diagnosis and treatment but to remind practicing physicians that coronary artery disease occurs at any age. Changes other than those due to arteriosclerosis may cause coronary occlusion. In infants and children, medial calcification with fibroblastic proliferation of the intima is the most frequent cause of coronary occlusion. Many congenital abnormalities have been found, and these are very frequently compatible with longevity, in fact, many unsuspected congential abnormalities are found only at autopsy. It is rather uncommon for these changes to cause or even contribute to the death of the individual.

Nichols (*1*) reported a gradual increase in the number of coronary deaths in the age group 60–64; after this there is a gradual decrease.

Overweight, infection, and physical strain have all been considered as precipitating factors in the young age group.

Summary

1. Four cases of coronary occlusion and myocardial infarction in males, aged 25, 30, 32, and 34, are presented.

2. A review of the literature on the subject of coronary artery disease in young adults is included.

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Incidence 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

Reports From States for Week Ended September 8, 1951

The total reported cases of poliomyelitis in the Nation increased from 1,762 last week to 1,871 for the current week. Since the seasonal low week, 14,311 total cases have been reported compared with 14,092 for the corresponding period in 1950. The cumulative total for the calendar year was 15,523 and for 1950, the corresponding total was 15,223.

Four of the nine geographic divisions reported increases in total poliomyelitis cases; the Middle Atlantic (from 218 to 260), slight increases in the East North Central (from 422 to 458), and the largest in the West South Central (from 157 to 245). In the Middle Atlantic Division, Pennsylvania reported most of the increase, from 54 cases last week to 89 for the current week. Ohio and Michigan also reported increases in the East North Central Division. In the West South Central Division, Louisiana reported an increase from 27 cases last week to 100 currently. No explanation has been received of the sudden increase in poliomyelitis reported in this State.

Decreases were reported in five geographic divisions, the most pronounced being in the Pacific, from 190 cases last week to 149 currently. Of the three States in this division, the largest decrease occurred in California, from 148 cases last week to 117 currently.

Malaria

Additional reports from States summarizing reported cases of malaria from January 1 through August show that a large majority are from military establishments. In Massachusetts 38 of a total of 39 cases were from military establishments. In California 16 cases were reported in civilians and 112 from the military. Two of the 16 civilian cases had probable sources of infection in California. Oklahoma reported 37 cases in civilians and 210 from military establishments. In South Carolina 19 civilian cases and 122 from the military have been reported. Only 1 of the 19 civilian cases was confirmed by blood smear and 9 were reported by 1 physician on clinical evidence only. In New York State, exclusive of New York City, 44 cases were reported in military personnel and 2 in civilians who had received

therapy for malaria in the past. In Arkansas 8 civilian cases, all Korean veterans, and 133 from military establishments were reported from January 1 to September 1, inclusive. Other States have reported smaller numbers of cases.

Epidemiological Report

Salmonellosis

Dr. D. H. Stevens, Maine Department of Health and Welfare, has reported nine cases of salmonellosis occurring between July 26 and August 7 in adjoining towns of Aroostook County. Six of seven cases in one town had consumed raw milk from a small dairy, and one of the six was the dairy owner's son. The seventh case was a relative of the dairy owner. One of the two cases in the other town had attended religious camp meetings with persons from the first town, but no clue as to a possible source was obtained in the second case. Laboratory examinations revealed *Salmonella paratyphi B* in the stools of six of the nine cases. Two other persons in the first town have been found to be harboring the same organism. Investigated cases have had "typhoidal" symptoms. Evidence, as yet unconfirmed, points toward a young relative of the dairy owner, who visited there late in July and is known to have handled milk. The boy remained a convalescent carrier following a paratyphoid B infection in 1948, but has refused to submit further specimens on religious grounds.

Dr. M. H. Merrill, California Department of Health, has reported two outbreaks of salmonella food infection. In 1 outbreak, 40 persons had a "pot luck" dinner in a private home, and of this group 30 are known to have become ill 12 to 48 hours afterward. Evidence pointed to home-made ice cream in which duck eggs and condensed milk were used in the mix, as the source of infection. The mixture stood at room temperature for 1½ hours before freezing. No specimens of ice cream were available for bacteriological examination, and other eggs from the same ducks showed no salmonella organisms. *Salmonella typhimurium* was isolated from most of the cases. In the second outbreak, 67 cases were reported among persons partaking of a smorgasbord dinner. Chopped liver is suspected of being the vehicle of infection, but none was available for examination. The incubation period varied from 5 to 71 hours. *Salmonella dublin* was isolated from patients.

Disease of Unknown Etiology

Dr. W. G. Beadenkopf, New York State Department of Health, has reported the occurrence of a disease in Putnam and Westchester Counties during July and August in which both gastrointestinal and respiratory symptoms were prominent. In each community it was estimated that 10 to 20 percent of the population was affected, with a somewhat higher rate in children. The onset was usually sudden

with fever, headache, sore throat, nausea, vomiting, and abdominal pain in about a third of the cases. On examination, pharyngeal injection, flushed face, and abdominal tenderness were frequently seen. Stiffness of the neck was noted in one-fourth of the cases. Infection by contact was suggested because of multiple cases in some families. Laboratory examinations so far have been inconclusive, but virus detection studies are incomplete.

Infectious Hepatitis

Dr. L. L. Parks, Florida State Board of Health, has reported seven cases of infectious hepatitis in Broward County. Predominate findings have been fever, enlarged liver and pneumonitis.

Comparative Data For Cases of Specified Reportable Diseases: United States

[Numbers after diseases are International List numbers, 1948 revision]

Disease	Total for week ended—		5-year median 1946–50	Seasonal low week	Cumulative total since seasonal low week		5-year median 1945–46 through 1949–50	Cumulative total for calendar year—		5-year median 1946–50
	Sept. 8, 1951	Sept. 9, 1950			1950–51	1949–50		1951	1950	
Anthrax (062)	------	1	------	[1]	[1]	[1]	[1]	46	30	36
Diphtheria (055)	74	112	146	27th	452	657	1,155	2,460	3,785	5,765
Encephalitis, acute infectious (082)	24	37	34	[1]	[1]	[1]	[1]	711	631	446
Influenza (480–483)	308	369	369	30th	1,640	2,052	1,934	117,695	140,816	130,429
Measles (085)	873	506	543	35th	873	506	543	469,784	288,677	552,229
Meningitis, meningococcal (057.0)	40	36	40	37th	3,971	3,666	3,574	3,010	2,753	2,602
Pneumonia (490–493)	468	700	[2]	[1]	[1]	[1]	[1]	[3]47,351	62,831	[2]
Poliomyelitis, acute (080)	1,871	1,743	1,726	11th	[4]14,311	14,092	13,833	[4]15,523	15,223	14,183
Rocky Mountain spotted fever (104)	5	11	17	[1]	[1]	[1]	[1]	278	394	467
Scarlet fever (050) [5]	227	291	355	32d	975	1,057	1,328	54,361	41,227	58,588
Smallpox (084)	------	------	------	35th	------	------	1	11	26	50
Tularemia (059)	9	13	19	[1]	[1]	[1]	[1]	478	691	718
Typhoid and paratyphoid fever (040, 041) [6]	112	84	101	11th	[7]1,628	1,905	2,111	[7]2,063	2,415	2,596
Whooping cough (056)	952	1,890	1,798	39th	72,258	113,432	96,118	50,656	91,896	70,100

[1] Not computed.
[2] Data not available.
[3] Addition: Tennessee, week ended Sept. 1, 15 cases.
[4] Addition: Alabama, week ended Sept. 1, 20 cases.
[5] Including cases reported as streptococcal sore throat.
[6] Including cases reported as salmonellosis.
[7] Deduction: North Carolina, week ended Aug. 11, 1 case.

Reported Cases of Selected Communicable Diseases: United States, Week Ended Sept. 8, 1951

[Numbers under diseases are International List numbers, 1948 revision]

Area	Diphtheria (055)	Encephalitis, infectious (082)	Influenza (480–483)	Measles (085)	Meningitis, meningococcal (057.0)	Pneumonia (490–493)	Poliomyelitis (080)
United States	**74**	**24**	**308**	**874**	**40**	**468**	**1871**
New England	**1**	**3**	**2**	**102**	**1**	**18**	**55**
Maine			2	35	1	9	6
New Hampshire				4		2	4
Vermont				12			1
Massachusetts	1	3		39			21
Rhode Island				6			3
Connecticut				6		7	20
Middle Atlantic	**3**	**5**		**220**	**5**	**34**	**280**
New York	1	3	(1)	134	2		128
New Jersey		2		29	1	10	43
Pennsylvania	2			57	2	24	89
East North Central	**6**	**3**	**3**	**202**	**8**	**60**	**458**
Ohio	5			28	4		102
Indiana		1	1	5		1	22
Illinois		1	1	65	4	44	108
Michigan	1	1	1	34		15	120
Wisconsin				70			106
West North Central	**6**	**3**		**32**	**3**	**64**	**230**
Minnesota	3			8	1	2	45
Iowa	2			3		1	31
Missouri		2		3	1		33
North Dakota				3		59	4
South Dakota				3		1	5
Nebraska				1			28
Kansas	1	1		11	1	1	84
South Atlantic	**23**	**2**	**155**	**88**	**6**	**69**	**124**
Delaware				1			
Maryland		1	5	37		19	13
District of Columbia				7		16	7
Virginia	1		123	17	2	25	14
West Virginia				3	1		21
North Carolina	7			3	1		16
South Carolina	7		5	4	1		2
Georgia	8	1	22	13	1	9	43
Florida				3			8
East South Central	**14**	**3**		**27**	**6**	**41**	**155**
Kentucky	3			19		1	27
Tennessee	2			5	5		63
Alabama	9	2		1		34	33
Mississippi		1		2	1	6	32
West South Central	**7**	**2**	**68**	**57**	**6**	**120**	**245**
Arkansas			37		1	17	28
Louisiana		1		2		15	100
Oklahoma			31	3		8	44
Texas	7	1		52	5	80	73
Mountain	**1**		**62**	**51**	**1**	**17**	**195**
Montana			7	9			6
Idaho				9			10
Wyoming				1			13
Colorado				13		8	92
New Mexico	1		1	6	1	4	6
Arizona			54	6		5	22
Utah				6			44
Nevada				1			2
Pacific	**13**	**3**	**18**	**95**	**4**	**45**	**149**
Washington			8	11		1	20
Oregon	6		5	17		5	12
California	7	3	5	67	4	39	117
Alaska							1
Hawaii			7	29		2	1

[1] New York City only.

Reported Cases of Selected Communicable Diseases: United States, Week Ended Sept. 8, 1951—Continued

[Numbers under diseases are International List numbers, 1948 revision]

Area	Rocky Mountain spotted fever (104)	Scarlet fever [1] (050)	Smallpox (084)	Tularemia (059)	Typhoid and paratyphoid fever [2] (040, 041)	Whooping cough (056)	Rabies in animals
United States	**5**	**227**		**9**	**112**	**952**	**97**
New England		**18**			**3**	**81**	
Maine		2				20	
New Hampshire		2					
Vermont		5				10	
Massachusetts		6			3	41	
Rhode Island		1					
Connecticut		2				10	
Middle Atlantic		**26**			**10**	**137**	**8**
New York		16			1	74	3
New Jersey		2			1	20	
Pennsylvania		8			8	43	5
East North Central		**70**			**5**	**184**	**19**
Ohio		26				52	
Indiana		3			1	25	[3] 12
Illinois		12			1	26	4
Michigan		24			1	26	3
Wisconsin		5			2	55	
West North Central		**13**			2	49	**9**
Minnesota					1	5	2
Iowa		2			1	10	3
Missouri		2				22	1
North Dakota		1				3	
South Dakota		2					
Nebraska							3
Kansas		6				9	
South Atlantic	**5**	**36**		**3**	**17**	**69**	**12**
Delaware		1					
Maryland	2	6			4	1	
District of Columbia		6				1	
Virginia	2	5		2	3	22	3
West Virginia		4			2		1
North Carolina	1	9			1	16	
South Carolina		1			4	3	3
Georgia		2			3	15	5
Florida		2		1		11	
East South Central		**13**			**21**	**73**	**24**
Kentucky		4			8	29	10
Tennessee		6			10	21	8
Alabama		2			3	22	4
Mississippi		1				1	2
West South Central		**11**		**4**	**16**	**250**	**24**
Arkansas		1		2	2	13	2
Louisiana		1			2		
Oklahoma		3		1	5	19	
Texas		6		1	7	218	22
Mountain		**5**		**2**	**1**	**42**	**1**
Montana						2	
Idaho						4	
Wyoming				2	1	2	
Colorado		4				20	
New Mexico						3	1
Arizona						8	
Utah		1				3	
Nevada							
Pacific		**35**			**37**	**67**	
Washington		3			2	4	
Oregon		6			1		
California		26			34	63	
Alaska							
Hawaii							

[1] Including cases reported as streptococcal sore throat.
[2] Including cases reported as salmonellosis.
[3] Report for 2 weeks.

FOREIGN REPORTS

CANADA

Reported Cases of Certain Diseases—Week Ended Aug. 25, 1951

Disease	Total	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Brucellosis	3					1	2				
Chickenpox	200	2		3		51	71	8	5	34	26
Diphtheria	6					5	1				
Dysentery, bacillary	6							1			5
Encephalitis, infectious	1								1		
German measles	58					11	9		8	17	13
Influenza	10			5			3	1	1		
Measles	268	4		28	5	70	24	15	9	75	38
Meningitis, meningococcal	5					3	2				
Mumps	118	2				26	50	6	15	9	10
Poliomyelitis	195			22	3	21	124	4	10	5	6
Scarlet fever	104					36	14	21	15	3	15
Tuberculosis (all forms)	215	3		6	9	77	25	40	10	17	28
Typhoid and paratyphoid fever	17					9	4			1	3
Venereal diseases:											
Gonorrhea	295	6		2	10	56	65	38	32	31	55
Syphilis	55			4	1	22	9	3	3	7	6
Primary	3					2					1
Secondary	5			2			1	1		1	
Other	47			2	1	20	8	2	3	6	5
Other forms	1										1
Whooping cough	162			13		66	27	6	11	24	15

FINLAND

Reported Cases of Certain Diseases—July 1951

Disease	Cases	Disease	Cases
Diphtheria	76	Typhoid fever	7
Dysentery	13	Venereal diseases:	
Meningitis, meningococcal	7	Gonorrhea	554
Paratyphoid fever	117	Syphilis	11
Poliomyelitis	8	Other forms	2
Scarlet fever	991		

NEW ZEALAND

Reported Cases of Certain Diseases and Deaths—4 Weeks Ended July 28, 1951

Disease	Cases	Deaths	Disease	Cases	Deaths
Brucellosis	5		Influenza	2	2
Diphtheria	8		Meningitis, meningococcal	15	2
Dysentery:			Poliomyelitis	2	
Amebic	3		Scarlet fever	66	
Bacillary	6		Tetanus	3	
Encephalitis, infectious	4	1	Trachoma	2	
Erysipelas	8		Tuberculosis (all forms)	151	42
Food poisoning	64		Typhoid fever	8	

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

The following reports include only items of unusual incidence or of special interest and the occurrence of these diseases, except yellow fever, in localities which had not recently reported cases. All reports of yellow fever are published currently.

Cholera

Burma. A total of five cases of cholera and three deaths was reported in Tavoy for August 19–25. For the previous period, August 12–18, 7 deaths were reported with 12 cases.

Plague

Brazil. For the period June 1–30, a total of two cases of plague was reported. The total included one case in Bodoco, and one case in Exu, Pernambuco State. For the period, July 1–31, one case of plague was reported from Bodoco.

Smallpox

French Equatorial Africa. For the period, August 11–20, 21 cases and 3 deaths from smallpox were reported in Tchad.

French West Africa. For the period, August 11–20, a total of 58 cases and 3 deaths from smallpox was reported. The total includes nine cases and one death reported previously from Dahomey. The total also includes 21 cases and no deaths from the Ivory Coast and 15 cases and 2 deaths from Soudan.

Indochina. For August 19–25, cases of smallpox were reported in Viet Nam as follows: Haiphong, 5; Saigon, 1; and Hanoi, 11.

Typhus Fever

Algeria. For August 11–20, one case of typhus fever was reported.

Chile. For August 19–25, three cases were reported in Santiago.

Iran. For the period, August 26–September 1, one case of typhus fever was reported.

Iraq. For the period, August 26–September 1, three cases of typhus fever were reported.

Mexico. For the period, July 15–21, one case of typhus fever was reported in Camargo. For the period July 15–28, a total of five cases, and for the period, July 29 to August 11, a total of eight cases of typhus fever were reported from Mexico, D. F.

Turkey. For the period, August 26–September 1, one case of typhus fever was reported.

Yellow Fever

Costa Rica. A total of five deaths from jungle yellow fever for August 16 was reported in San Miguel Zone, Sarapiqui, and a total of three deaths from the same cause was reported for the period August 26 to September 1 in Los Angeles Zone, Sarapiqui.