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Statistical Studies of Heart Disease

VI. Age at Onset of Heart and Other Cardiovascular-Renal Diseases

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In this study an attempt is made to find by an indirect method the age at onset (strictly speaking, the age at first diagnosis) of cases of heart and other types of cardiovascular-renal diseases occurring in the general population. The results of a direct approach to this question were published in the fifth report of this series (*9*). There, the cases found in a surveyed population were classified by age and also according to whether disability resulted and, if so, whether the disability had had its first onset during the period of study. The period of study was defined as the 12 months preceding the visit of an interviewer.

The data for that direct approach and also for the approach described in this report were taken from the National Health Survey of 1935–36. The health survey procedures have been described in detail elsewhere (*1*), and it is sufficient to repeat here that the survey involved a single visit to each of some 700,000 households in urban communities in 18 States by interviewers who recorded the illness experienced in the household over a period of a year prior to the day of the visit. The types of cases recorded were as follows:

1. Disabling cases existing on the day of the visit, and all cases of chronic illness, whether or not disabling (that is, unable to work or perform usual activities, such as going to school, housework, and so forth).
2. Cases that had caused seven or more consecutive days of disability during the year prior to the visit.
3. Hospital cases in the year prior to the visit, regardless of the number of days of disability.
4. Cases resulting in death during the year, regardless of the duration of disability.

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The informant in the household, usually the housewife, naturally could report only on illness of which she was aware among household members and could only pass on to the interviewer such diagnoses as the physician had given to the family, or (in the case of minor illnesses and accidents) such as the family knew or suspected as a result of their own education or experience. In a subsample of cases the family diagnosis was sent for verification to the physician who had been in attendance. The results of this check give one basis for estimating the maximum completeness of counting of cases of heart and other diseases. (See appendix to fifth report (*9*) of this series.)

The number of cases with onset of disability occurring during the study year and with no history of a previous attack (which will be called here simply "onset within—no previous attack") gave a measure of the incidence in the surveyed population of new cases causing disability of seven or more consecutive days in the year of their onset.[1] Such figures, even if one takes into account the lack of completeness in the counting of heart disease cases obtained from a household survey, should give a fairly accurate picture of the general pattern of onset of disabling heart disease according to age. The same would be true for the other cardiovascular-renal diseases considered.

However, it was felt that the question of age at onset might be approached in another manner—a manner which did not depend upon knowing whether a particular case did or did not originate during the study year and which made use of all cases recorded during the survey, including those causing no disability and those having their onset before the study year.

It should be recognized that when the cases that caused no disability during the study year are included, an entirely new and, in general, less severe type of case is added. Fifty-two percent of the cases of heart disease existing on the day of the visit had caused no disability during the preceding year. (The corresponding percentages for hypertension, including intracranial lesions and arteriosclerosis, and for nephritis, including other forms of kidney disease as well, were 62 and 46, respectively.) Furthermore, 39 percent had not even caused a restriction of activity in the preceding year. (Corresponding percentages were 51 for hypertension and 38 percent for nephritis.)[2] It seems likely that some of these nondisabling cases (particularly those originating within the last year) were discovered,

[1] Actually these "onset within—no previous attack" cases as used in this paper include three types of new cases of less than 7 days of consecutive disability: (1) cases in which the onset of disability was less than 7 days prior to the visit and in which the person was still disabled; (2) cases involving hospitalization, which were included regardless of the duration of disability; and (3) cases resulting in death even though death was not preceded by as long as a week of disability.

[2] These proportions are for cases at all ages combined. The proportions were found to be lower for advanced ages (and also lower for the cases at younger ages which were, however, much less numerous). See figures 5, 6, and 7 in reference (*9*).

not by the onset of symptoms and a trip to the doctor's office, but as a result of a physical examination taken, perhaps, in connection with a job or school attendance. It is natural to expect that the age at "onset," meaning the age of discovery, of such cases would differ from the age at onset of cases causing seven or more days of disability during the study year. Nevertheless, the more inclusive universe of cases considered here is also of interest, particularly since the non-disabling cases of one age may be the disabling cases of a later age.

An unduplicated count of all cases and deaths from heart or other cardiovascular-renal disease recorded in the National Health Survey is very close to a prevalence type of count of recognized cases as of the first day of the year prior to the interviewer's visit. To the extent that cases first diagnosed during the year are included, the unduplicated count is an overestimate of prevalence at the beginning of the year. Since "all recorded cases" is defined to include deaths during the year, the total of all cases would also represent an overcount of the prevalence at the end of the year. However, this overcounting is almost certainly more than counterbalanced by the natural under-enumeration inherent in the survey method for which no precise correction factor is available. See appendix to reference (*9*). Hence, in this analysis the count of all recorded cases of heart disease, hypertension, and nephritis was assumed to be the true prevalence of each of these diseases, the ages of the surveyed population being taken as of the beginning of the study year.[3]

The term heart disease is taken to include all forms of heart disease (and undifferentiated heart disease) except syphilitic and thyrotoxic heart disease. Hypertension includes high blood pressure, arteriosclerosis, and intracranial lesions, such as cerebral hemorrhage. Nephritis includes all types of kidney disease, but chronic nephritis cases form by far the largest proportion in this category.

The procedure followed in order to find the curve of incidence of these diseases by age, starting with the curve for "all recorded cases" is described in detail in the appendix to this report. It adheres quite closely to the method used by Spiegelman and Marks to estimate the age and sex distribution of the new diabetic cases expected in the population of the United States each year (*2*). The method makes certain assumptions. It assumes that:

1. The members of the survey population and of the general population acquire the disease at about the same ages.
2. The prevalence found at each age at the time of the survey has arisen as the result of a fixed rate of onset at each age in the population under observation and a fixed rate of dying at each

[3] For example, the total of all cases recorded among persons stating that they were 56 years of age at the time of the survey was considered to be the prevalence among persons 55½ years of age, because at the time of the survey these people were actually 56½ years of age, on the average. At the beginning of the study year they were, of course, 1 year younger.

age among persons with the disease, both of these fixed sets of rates having been operative over a long period of time (the human life span).

3. A person having once acquired the disease would never during his lifetime be reported as free of this disease; thus, the number of persons at age x who are stated to have the disease represents the total number who acquired it before age x and survived to age x.

Other less fundamental assumptions made in this report will be discussed in the appendix, but those described above are the chief assumptions necessary to an evaluation of the results.

The first assumption seems sound on intuitive grounds for the cardiovascular-renal diseases except for the fact that the population studied was entirely urban. It is quite possible that the age at onset does differ in urban and rural areas but, since the age at which the disease is detected and diagnosed also differs, it would be almost impossible to determine by a household survey whether an apparent difference in age at onset was real or whether it resulted from noncomparability in amount of medical attention received. In any case, no adequate data for rural areas are available.

The second assumption is not valid if there has been a marked trend in the rate of onset (incidence) or the rate of dying (case fatality) but, whatever the trend, the results will depict an average of the experience over a long period of time. There is very little evidence on the matter of a trend in the incidence of heart disease. The apparent trend in the mortality from heart disease may quite possibly be entirely artificial.[4] The same holds true for the other cardiovascular-renal diseases.

There are definite signs that the third assumption is not in accord with the actual situation for heart disease and nephritis at the younger ages. It is not uncommon for rheumatic valvular heart disease to be inactive for periods averaging 10 to 12 years (*4*), and persons in this inactive stage might easily not be reported to an interviewer as having heart disease. However, this disagreement with the assumption is only noticeable in the prevalence rates at the early ages of life, and beyond age 30 the rheumatic valvular disease begins to be submerged in the larger number of cases of arteriosclerotic and hypertensive heart disease. Thus, it is safe to say that as age increases beyond 30 the assumption is satisfied in all except an insignificant proportion of the cases.

The disagreement with the third assumption is greater in the case of nephritis and probably less in magnitude and certainly of less importance in the case of hypertension. Acute cases of nephritis were

[4] See the second report (*6*) of this series for a discussion of the trend of mortality from the cardiovascular-renal diseases in the United States.

not distinguished from chronic nephritis in the tabulations made from the National Health Survey because of the high proportion of undifferentiated "nephritis" and "kidney trouble" that made up the kidney category. Acute nephritis is fairly common in childhood and at early adult ages. Recovery is complete in many of these cases. Hence, the number stated to have nephritis at age 40, for example, is less than the number who acquired it before that age and survived to their 40th birthday. The effect of this departure from the assumptions upon the computation of incidence is shown below.

Incidence of the Cardiovascular-Renal Diseases

Table 1 and figures 1, 2, and 3 show the estimated incidence in new cases per 100,000 population of heart disease, hypertension, and nephritis by age and sex. The method of estimation and data used are described in the appendix. In the graphs different parts of the age curves are plotted on different scales with an overlapping at the middle years of life. The right-hand curve, which should be read against the right-hand scale, shows the general shape of the entire curve and the very sharp increase in the incidence of all three of these diseases, or disease groups, with age. The left-hand curve, which makes it possible to study in more detail the shape of the curve and the sex differences at the younger ages, should be read against the left-hand scale.

Table 1. *Estimated annual rate of incidence (number of new cases per 100,000 population per year) for all cases of heart disease, hypertension and nephritis by age and sex, based on data from the National Health Survey of 1935–36*

Age in years	Heart disease [1]		Hypertension [1]		Nephritis [1]	
	Male	Female	Male	Female	Male	Female
5–9 [2]	59	74	1	4	39	16
10–14	42	55	12	14	14	(3)
15–19	3	36	25	42	10	16
20–24	26	55	37	53	21	44
25–29	74	115	52	67	33	44
30–34	152	157	75	117	52	55
35–39	223	206	109	199	73	78
40–44	302	274	197	323	91	85
45–49	480	397	314	540	148	129
50–54	829	678	548	683	246	237
55–59	1,535	1,024	912	873	384	334
60–64	2,087	1,511	1,465	1,190	643	499
65–69	3,046	2,440	2,271	1,737	1,083	774
70–74	4,236	3,430	3,340	2,655	1,611	1,314
75–79	6,061	4,844	5,350	3,868	2,508	2,152
80–84	9,751	8,057	9,896	7,398	4,420	3,867
85–89	14,959	17,601	17,411	18,644	9,663	9,141

[1] Rates for the three disease groups are not additive because one person may have more than one disease.
[2] Rates for "Under 5 years" and "90 years and over" not shown because of their probable unreliability.
[3] Less than 0.5 per 100,000.

On the same graphs will be found the rates for new cases ("onset within—no previous attack") disabling for seven or more consecutive

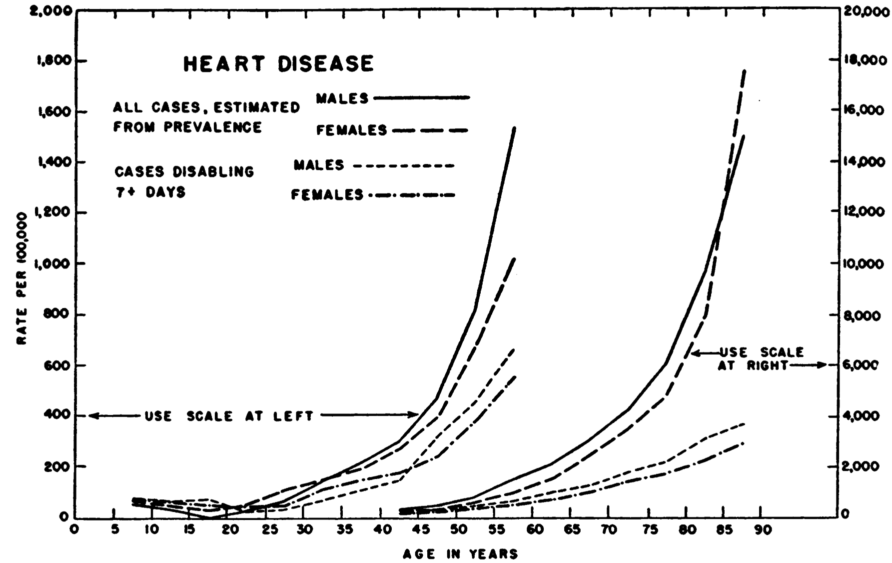

Figure 1. Estimated annual incidence rates (per 100,000 population) for heart disease (all forms) by age and sex, from National Health Survey.

days, discussed above. Since these latter cases constitute, by definition, only a part of the total incidence, it would seem necessary that the curve for disabling cases should over its entire length be below that for all new cases. The circumstance that it crosses the curve for all new cases at the younger ages is due to the fact that the third of the

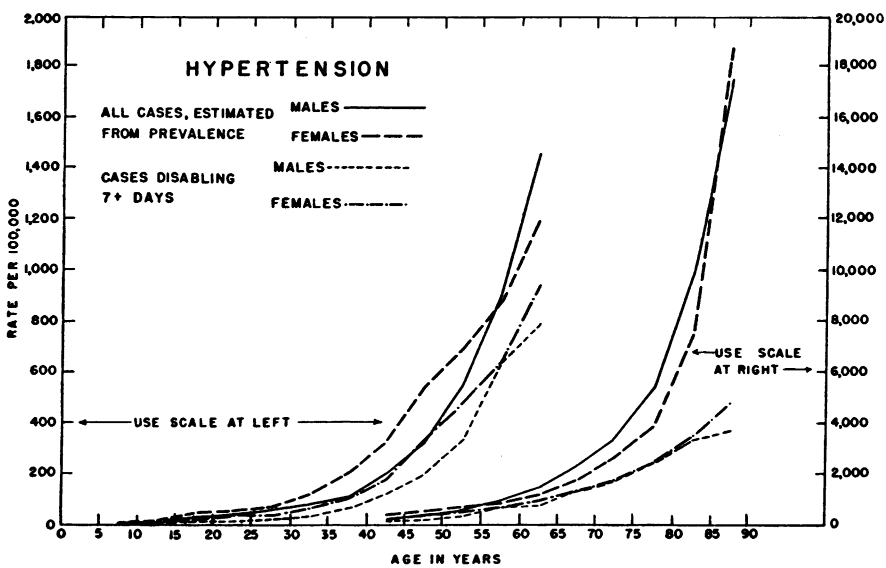

Figure 2. Estimated annual incidence rates (per 100,000 population) for hypertension (including intracranial lesions of vascular origin) by age and sex, from National Health Survey.

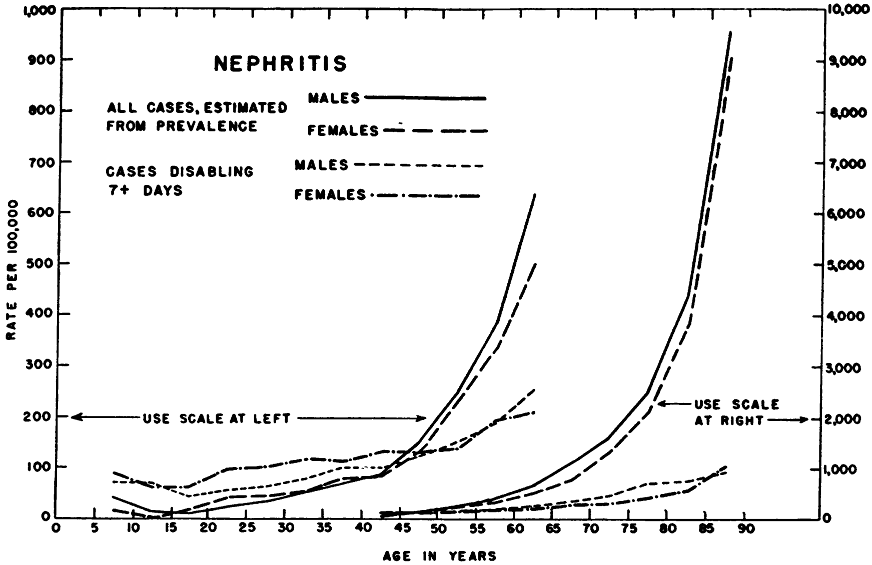

Figure 3. Estimated annual incidence rates (per 100,000 population) for nephritis (all forms) by age and sex, from National Health Survey.

assumptions made in the construction of the curve for all new cases is not well satisfied at the younger ages, as has been mentioned. This crossing over does not occur in the case of hypertension except at the youngest age group shown, 5 to 9 years, indicating that the agreement with assumption may be better in the case of this disease group. On the other hand, the nephritis curves cross over between 40 and 50 years of age which can be attributed to the predominance of non-chronic types of nephritis below middle life.

The extent of difference at any given age between the incidence of all new cases, as estimated, and the incidence of new cases disabling seven or more days during the study year, as computed directly from the tabulations, is a function of several variables and should not be interpreted too exactly. Briefly, the factors that influence this difference are:

1. The proportion of all new cases of cardiovascular-renal disease at any one age that cause disability in the calendar year of onset;
2. The difference in reliability of a rather complex estimate with several broad assumptions and a simple series of rates computed from the tabulations;
3. The probable relative incompleteness of counting of new cases ("onset within—no previous attack") disabling for seven days or more in the past year when compared with the counting of persons having the condition on the day of visit of the interviewer, the estimates for the all-cases curve being based upon the latter.

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Two further remarks should be made to clarify the interpretation of these curves. First, the incidence for the three disease groups at any given age is not additive, because there is a considerable degree of overlapping in these closely related chronic conditions. (For a discussion of the extent of this overlapping, see reference (*9*), and particularly figure 1 in that report.)

Table 2a. *Crude abridged life table showing how many out of 100,000 infants of each sex can be expected to acquire heart disease between specified birthdays; and certain other measures of heart disease incidence and mortality from the life table*

[See text for complete description]

Exact age x (1)	Prevalence of heart disease (per head) at exact age x (National Health Survey) (2)		Number still living at exact age x (1939–41 life table) (3)		Number living at exact age x who have heart disease (4)		Number acquiring heart disease between exact age x and $x+5$ (5)	
	Male	Female	Male	Female	Male	Female	Male	Female
0	0	0	100,000	100,000	0	0	(1)	(1)
5	.00395	.00330	93,624	94,848	370	313	277	349
10	.00582	.00585	93,054	94,402	542	552	193	259
15	.00670	.00745	92,508	94,000	620	700	16	169
20	.00540	.00795	91,617	93,293	495	742	118	254
25	.00482	.00920	90,385	92,322	436	849	334	529
30	.00608	.01275	89,009	91,182	541	1,163	669	710
35	.00957	.01710	87,371	89,810	836	1,536	965	916
40	.01362	.02195	85,246	88,092	1,161	1,934	1,266	1,192
45	.01702	.02720	82,336	85,856	1,401	2,335	1,929	1,677
50	.02155	.03360	78,254	82,828	1,686	2,783	3,131	2,742
55	.03070	.04475	72,627	78,708	2,230	3,522	5,297	3,895
60	.04995	.05805	65,142	73,093	3,254	4,243	6,324	5,249
65	.06755	.07460	55,776	65,523	3,768	4,888	7,665	7,408
70	.09020	.10035	44,588	55,449	4,022	5,564	8,117	8,433
75	.10970	.11915	31,864	42,425	3,495	5,055	7,679	8,481
80	.12360	.12285	18,995	27,524	2,348	3,381	6,599	8,253
85	.12435	.11925	8,693	13,972	1,081	1,666	4,022	7,975
90	---	---	2,787	5,044	283	579	---	---

Exact age x (1)	Number dying *with* heart disease between exact age x and $x+5$ (6)		Chances in 100 of acquiring heart disease between exact age x and $x+5$ (7)		Chances in 100 of acquiring heart disease between exact age x and $x+1$ (8)		Chances in 100 of ever acquiring heart disease after exact age x (9)	
	Male	Female	Male	Female	Male	Female	Male	Female
0	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
5	105	110	.30	.37	.06	.09	58.55	61.87
10	115	110	.21	.28	.05	.07	58.72	61.95
15	141	126	.02	.18	.02	.04	58.91	62.04
20	177	148	.13	.27	.00	.02	59.39	62.36
25	229	214	.37	.58	.05	.10	60.03	62.82
30	374	337	.76	.79	.13	.14	60.66	63.24
35	640	519	1.12	1.04	.19	.18	61.24	63.69
40	1.026	792	1.51	1.38	.27	.25	61.88	64.19
45	1.644	1.229	2.38	2.01	.39	.34	62.72	64.79
50	2.587	2,004	4.09	3.43	.67	.56	63.78	65.51
55	4,272	3,174	7.52	5.18	1.37	.92	64.92	66.09
60	5,811	4,603	10.22	7.62	1.89	1.31	65.29	66.52
65	7,415	6,732	14.74	12.22	2.74	2.16	65.53	66.88
70	8.645	8,941	20.01	16.90	4.02	3.30	65.12	66.44
75	8.827	10.153	27.07	22.69	5.54	4.64	64.51	66.12
80	7,866	9,969	39.64	34.18	8.90	6.74	63.80	67.22
85	4,819	9,062	52.84	64.81	13.73	13.99	52.84	64.81
90	---	---	---	---	---	---	---	---

[1] Values for ages from birth to 5 years considered too unreliable to be useful.

Second, it should be made clear that in the rates for both the disabling and total cases the population in the denominator contains some persons who already have heart disease, hypertension, or nephritis, or more than one of these diseases. Hence, they do not represent probabilities that persons free of the particular disease at a given age will acquire it within a specified interval of time. Such

Table 2b. ***Crude abridged life table showing how many out of 100,000 infants of each sex can be expected to acquire hypertension between specified birthdays; and certain other measures of hypertension incidence and mortality from the life table***

[See text for complete description]

Exact age x (1)	Prevalence of hypertension (per head) at exact age x (National Health Survey) (2)		Number still living at exact age x (1939–41 life table) (3)		Number living at exact age x who have hypertension (4)		Number acquiring hypertension between exact age x and $x+5$ (5)	
	Male	Female	Male	Female	Male	Female	Male	Female
0	0	0	100,000	100,000	0	0	([1])	([1])
5	.00030	.00015	93,624	94,848	28	14	3	19
10	.00022	.00030	93,054	94,402	20	28	54	68
15	.00064	.00090	92,508	94,000	59	85	117	197
20	.00148	.00270	91,617	93,293	136	252	168	246
25	.00258	.00490	90,385	92,322	233	452	233	307
30	.00400	.00765	89,009	91,182	356	698	330	529
35	.00600	.01250	87,371	89,810	524	1,123	471	887
40	.00870	.02045	85,246	88,092	742	1,801	828	1,404
45	.01360	.03240	82,336	85,856	1,120	2,782	1,263	2,281
50	.02030	.05070	78,254	82,828	1,589	4,199	2,070	2,761
55	.03140	.06900	72,627	78,708	2,280	5,431	3,147	3,320
60	.04710	.08710	65,142	73,093	3,068	6,366	4,441	4,133
65	.06680	.10720	55,776	65,523	3,726	7,024	5,715	5,273
70	.08760	.13080	44,588	55,449	3,906	7,253	6,399	6,526
75	.10485	.15000	31,864	42,425	3,341	6,364	6,778	6,772
80	.11580	.15120	18,995	27,524	2,200	4,162	6,697	7,578
85	.12360	.14380	8,693	13,972	1,074	2,009	4,681	8,448
90	---	---	2,787	5,044	365	681	---	---

Exact age x (1)	Number dying *with* hypertension between exact age x and $x+5$ (6)		Chances in 100 of acquiring hypertension between exact age x and $x+5$ (7)		Chances in 100 of acquiring hypertension between exact age x and $x+1$ (8)		Chances in 100 of ever acquiring hypertension after exact age x (9)	
	Male	Female	Male	Female	Male	Female	Male	Female
0	([1])	([1])	([1])	([1])	([1])	([1])	([1])	([1])
5	11	6	<.005	.02	([2])	.01	46.36	53.51
10	16	13	.06	.07	.01	.01	46.64	53.75
15	40	28	.13	.21	.02	.03	46.88	53.94
20	72	44	.18	.26	.03	.05	47.25	54.24
25	109	59	.26	.33	.04	.06	47.76	54.66
30	162	104	.37	.58	.06	.09	48.30	55.16
35	254	210	.54	1.00	.09	.17	48.93	55.68
40	450	424	.98	1.63	.15	.24	49.72	56.20
45	794	864	1.56	2.75	.26	.49	50.72	56.69
50	1,379	1,530	2.70	3.51	.45	.65	52.08	56.99
55	2,358	2,386	4.47	4.53	.77	.84	53.82	57.38
60	3,783	3,475	7.16	6.19	1.23	1.11	55.92	58.04
65	5,536	5,044	10.98	9.01	2.05	1.65	58.16	59.14
70	6,965	7,414	15.73	13.54	3.01	2.50	60.36	60.84
75	7,919	8,974	23.76	18.78	4.72	3.84	63.65	63.22
80	7,823	9,733	39.87	32.44	8.35	5.82	67.75	68.60
85	5,390	9,775	61.44	70.62	14.99	14.67	61.44	70.62
90	---	---	---	---	---	---	---	---

[1] Values for ages from birth to 5 years considered too unreliable to be useful.
[2] Number of new cases turned out to be negative. See text.

rates are shown in table 2. The rates in table 1 are of the nature of annual incidence rates.

Probability of Acquiring the Cardiovascular-renal Diseases

The method used in proceeding from the prevalence of "all recorded cases" to the number of new cases arising between one age and the

Table 2c. *Crude abridged life table showing how many out of 100,000 infants of each sex can be expected to acquire nephritis between specified birthdays; and certain other measures of nephritis incidence and mortality from the life table*

[See text for complete description]

Exact age x (1)	Prevalence of nephritis (per head) at exact age x (National Health Survey) (2)		Number still living at exact age x (1939-41 life table) (3)		Number living at exact age x who have nephritis (4)		Number acquiring nephritis between exact age x and $x+5$ (5)	
	Male	Female	Male	Female	Male	Female	Male	Female
0	0	0	100,000	100,000	0	0	[1]	[1]
5	.00165	.00235	93,624	94,848	154	223	180	75
10	.00230	.00250	93,054	94,402	214	236	65	2
15	.00200	.00211	92,508	94,000	185	198	45	73
20	.00186	.00250	91,617	93,293	170	233	95	203
25	.00224	.00400	90,385	92,322	202	369	147	203
30	.00290	.00505	89,009	91,182	258	460	228	247
35	.00400	.00605	87,371	89,810	349	543	316	346
40	.00520	.00733	85,246	88,092	443	646	381	369
45	.00598	.00782	82,336	85,856	492	671	594	546
50	.00742	.00893	78,254	82,828	581	740	930	957
55	.00997	.01208	72,627	78,708	724	951	1,327	1,270
60	.01340	.01485	65,142	73,093	873	1,085	1,950	1,735
65	.01950	.01800	55,776	65,523	1,088	1,179	2,724	2,350
70	.02865	.02212	44,588	55,449	1,277	1,227	3,086	3,231
75	.03570	.02865	31,864	42,425	1,138	1,215	3,178	3,768
80	.04230	.03150	18,995	27,524	803	867	2,991	3,961
85	.04880	.03258	8,693	13,972	424	455	2,598	4,142
90	---------	---------	2,787	5,044	154	168	---------	---------

Exact age x (1)	Number dying *with* nephritis between exact age x and $x+5$ (6)		Chances in 100 of acquiring nephritis between exact age x and $x+5$ (7)		Chances in 100 of acquiring nephritis between exact age x and $x+1$ (8)		Chances in 100 of ever acquiring nephritis after exact age x (9)	
	Male	Female	Male	Female	Male	Female	Male	Female
0	[1]	[1]	[1]	[1]	[1]	[1]	[1]	[1]
5	119	62	.19	.08	.04	.03	22.29	24.81
10	95	40	.07	.00	.03	[2]	22.25	24.85
15	62	38	.05	.08	[2]	.01	22.30	24.95
20	64	66	.10	.22	.02	.04	22.47	25.07
25	92	112	.16	.22	.03	.05	22.68	25.15
30	138	164	.26	.27	.04	.05	22.88	25.27
35	223	242	.36	.39	.07	.07	23.07	25.40
40	332	344	.45	.42	.08	.08	23.30	25.53
45	504	476	.73	.64	.12	.10	23.68	25.78
50	787	746	1.20	1.17	.20	.19	24.18	26.09
55	1,179	1,135	1.85	1.63	.32	.29	24.83	26.31
60	1,735	1,641	3.03	2.41	.52	.42	25.72	26.65
65	2,534	2,302	4.98	3.65	.86	.64	26.65	27.12
70	3,226	3,244	7.13	5.96	1.39	1.05	27.37	27.85
75	3,512	4,115	10.34	9.14	2.07	1.76	28.53	28.81
80	3,371	4,373	16.44	14.86	3.44	2.92	30.72	30.40
85	2,868	4,429	31.42	30.64	6.74	6.21	31.42	30.64
90	---------	---------	---------	---------	---------	---------	---------	---------

[1] Values for ages from birth to 5 years considered too unreliable to be useful.
[2] Number of new cases turned out to be negative. See text.

next permits the derivation of several auxiliary age curves of interest. In fact, the rates shown in table 1 are actually auxiliary, having been derived from the basic computations which are shown in abridged life-table form in table 2.

The concept is that of the life table. The progress of an initial cohort of 100,000 infants, all born alive at exactly the same moment, is followed through life. In the ordinary life table, death is the only event considered, and the table is designed to show the ages at which the members of the cohort would die if prevailing rates of mortality at each age continued to operate without change throughout their lifetime. The number surviving to their xth birthday is assigned the symbol l_x. In this study, the age at which the members of the cohort might be expected to acquire heart disease (or whichever of the three disease groups is under consideration) is also considered. Survivors at the xth birthday are divided into two categories: (1) those who have already become afflicted with heart disease [5] (l'_x); and (2) those who have not ($l_x - l'_x$). By the time of the $x+1$st birthday of the cohort, there has been a change in the number who have acquired the disease. This change occurring between the xth and $x+1$st birthdays can be expressed by the following simple relationship:

$$l'_{x+1} = l'_x + i_x - d'_x$$

in which l'_{x+1} is the number of persons with heart disease surviving to the $x+1$st birthday, i_x is the number of members of the cohort acquiring heart disease in the interval, and d'_x is the number of members of the cohort who died *with* heart disease (not necessarily *from* heart disease) in the interval. This last symbol includes deaths among the l'_x group and also a few among the i_x group. Note that if any persons recovered spontaneously from the disease it would be necessary to have another symbol, representing recoveries, on the right-hand side of the equation with a minus sign in front of it. The essence of the method used by Spiegelman and Marks (*2*) and adapted for use here is that the l'_x values are estimated by applying prevalence rates from the National Health Survey to the figures in the l_x column of the appropriate life table, the d'_x values are estimated from whatever data are available, and then the equation shown above is solved for i_x.[6]

The explanation of the columns in table 2a is as follows (tables 2b and 2c were prepared in an identical manner):

Column 1: This is the xth anniversary of the birth of the cohort of 100,000 individuals. It is shown only at intervals of 5 years to shorten the table.

[5] The discussion throughout is for heart disease but is equally applicable if some other disease satisfying the assumptions discussed above is substituted, in particular, hypertension or nephritis.

[6] The process is actually slightly more complicated than this because the d'_x's cannot be estimated directly. See appendix.

Column 2: This is the value of the prevalence of heart disease from the National Health Survey, interpolated for the exact age shown in column 1 and expressed on a per person basis.

Column 3: This is the number out of 100,000 born simultaneously who would survive to the age in column 1 under the conditions of mortality existing in the years 1939–41.

Column 4: This is the product of the figures in columns 2 and 3 and represents the number surviving to this age with heart disease.

Column 5: This is the estimated number acquiring heart disease between the xth and $x+5$th birthday.

Column 6: This is the estimated number dying *with* heart disease between the xth and $x+5$th birthday. Note that the figure in column 4 plus that in column 5 minus that in column 6 gives the figure in column 4 for the next line down. (Slight differences are due to rounding-off.)

Column 7: This represents the probability (expressed as a percentage) of acquiring heart disease between the xth and $x+5$th birthday and is obtained by dividing the figure in column 5 by column 3 less column 4.

Column 8: A more useful figure but not derivable from other figures shown in this abridged table, this is the probability (expressed as a percentage) of acquiring heart disease between the xth and $x+1$st birthday. When multiplied by 1,000 this may be compared with the annual incidence rates shown in table 1. The figures in column 7 and column 8 differ from those in table 1 in that these are probability type rates.

Column 9: This shows the probability that a person who has reached age x without acquiring heart disease will ever acquire the disease. It is obtained by adding together all the new cases (in column 5) from age x to the end of life and dividing by the number who reached age x without acquiring heart disease (column 3 minus column 4) and multiplying by 100.

As an example of the way tables 2a, 2b, and 2c can be used, suppose it were necessary to estimate roughly how many out of a group of 1,000 males, all aged 20, or very close to that age, and free of heart disease, would acquire heart disease within the next 20 years. Table 2a shows that of the original cohort of 100,000 males there are 91,617 alive at their 20th birthday. Of these approximately 495 already have heart disease and 91,122 are still free of the disease. A total of 2,086 acquires it between age 20 and age 40; hence, the answer to the question proposed is that about 23 of the 1,000 males would acquire heart disease. From another function, not shown in table 2a but also required in the process of computing the tables, it is possible to estimate very roughly the proportion of persons at age x with heart disease who will survive to any given age beyond age x. Thus, one could determine in the example stated above not only that 23 of the 1,000 20-year-old males would acquire heart disease within 20 years but also the approximate number of those 23 who would survive to their 40th birthday.

In all three of the tables 2a, 2b, and 2c, the computations have been shown for more of the younger ages than is, perhaps, justified, considering the unreliability of the data and the lack of correspondence with the assumptions. This is demonstrated by the appearance of footnoted values in the tables for hypertension and nephritis indicating that the number of new cases turned out to be negative. However, in answering the type of questions presented in the example, such aberrations do not affect the estimate very greatly.

The 9th column of the tables can be used to estimate how many of the males and how many of the females now living in the population will acquire heart disease, hypertension, or nephritis in their lifetime. In the case of diabetes, Spiegelman and Marks speak of this as the "potentially diabetic population" (*2*).

It may seem curious that these functions in column 9, representing the chances of ever acquiring the disease, should increase gradually from childhood until the end of life or at least until very late in life. But it is a fact that in childhood and the young adult ages there is a fairly great chance of dying of some noncardiovascular-renal cause which takes its toll at the younger ages; thus, there is a substantial chance that younger persons will not reach the ages at which the rate of onset of the cardiovascular-renal diseases is very high. The person who has reached age 60, however, has, as it were, put many of the other risks behind him. The tables indicate that a child reaching his 5th birthday stands a 59-out-of-100 chance of being diagnosed sometime during life as having heart disease if a boy, a 62-out-of-100 chance if a girl. The corresponding figures for hypertension are 46 out of 100 for a boy and 53 out of 100 for a girl; and for nephritis they are 22 out of 100 for a boy and 25 out of 100 for a girl. The fact that the girl's chances are greater in each case is due to her greater average future lifetime. It should not be thought, however, that these represent the risks of experiencing a long, lingering illness of one or the other of these types. Some of the cases included represent conditions found only during physical examination which never cause more than minor disability, and some are conditions whose onset precedes death by only 24 hours or less, as in the case of cerebral hemorrhage or coronary occlusion. On the other hand, it should be remembered that these statistics, based on household surveys and including only conditions of which the person himself or his family are aware, are probably minimum estimates. Thorough physical examination of those not reporting these conditions might reveal many more who, in fact, had them. However, the more detailed the examination, the more abnormalities that will be found. The great majority of those included as having a cardiovascular-renal disease in the National Health Survey were persons who had had symptoms severe enough to cause them, at one time or another in the past, to seek medical advice.

Summary

In this, the sixth in a series of reports on the statistics of heart and other cardiovascular-renal diseases, data on prevalence from the

National Health Survey are used to estimate the age at onset of cases of these diseases. The prevalence rates by age are multiplied by the numbers of persons surviving to each age, taken from appropriate life tables. The results are assumed to represent the numbers of persons in the life table cohort who, having the disease, are still alive at a given age. These figures, together with estimates of the numbers of deaths among heart-disease patients at each age, are employed to compute approximate probabilities of acquiring the disease between one age and the next. The results may be used to make rough predictions, for example, of the proportion of persons alive at any given birthday who will acquire heart disease, hypertension, or nephritis before any other given birthday. Data are shown specific for sex and for each of the three major subdivisions of the cardiovascular-renal disease group. Particular attention should be paid to the definition of these subdivisions and the assumptions involved in the procedure before making use of the statistics.

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APPENDIX

Procedure in the Construction of the Rough Life Table to Show Incidence of Heart Disease in a Cohort of 100,000 Persons

1. The male prevalence rates for heart disease from the National Health Survey were plotted on an arithmetic grid in 5-year age groups through 84 years of age and for 85 years and over. Each age group was plotted as if the age were one year less than recorded in the survey, since the rates plotted were considered to represent prevalence at the beginning of the study year (year prior to visit). The age group was centered on the half-year because ages were recorded as of the last birthday. Hence, the 10- to 14-year group was actually plotted at age 11.5 years.

Through the points plotted as described, a smooth curve was passed with the aid of a set of French curves. The ordinate of this curve was then read off for each birthday from 1 to 90 years. These values, which were designated as r_x, were posted in the first column of a worktable having single years of age in the stub.

2. In the second column of this worktable the l_x values of the life table for total males (*3*) were posted by single years from 0 to 90.

3. The product of the first two columns was computed and the values entered in the third column of the table. This column was labeled l'_x.

4. The purpose of the next step was to obtain an age-specific death rate, from all causes, among persons with heart disease. The deaths among heart cases, as reported in the National Health Survey, were considered to be underenumerated. The following adjustments were made to correct for this:

(a) The total male deaths (all causes) in the National Health Survey by age (5-year groups) were posted on another worksheet. From these deaths were subtracted all National Health Survey male deaths in which heart disease was the sole, primary, or contributory cause. The results were posted. These remaining deaths were then multiplied by the male age-specific prevalence rates for nondisabling heart cases in the National Health Survey, the assumption being made that among the persons whose deaths were apparently not associated with heart disease there were in fact as many nondisabling heart disease cases as in the living population at those ages. (The nondisabling prevalence rate was used, since it seemed likely that the heart cases that missed being mentioned in the report of death would be only those of the nondisabling type.) The numbers of deaths obtained by this multiplication were added to the total number of male deaths among heart disease patients as reported in the National Health Survey. Age-specific death rates per 1,000 male patients with heart disease were then computed.

(b) It was further known that all deaths in the survey in which heart disease was involved were underenumerated, as were the deaths from other causes also in the National Health Survey, because of the dissolving of families that often takes place upon the death of one member. Therefore, the ratio of the United States heart disease death rate for 1936 to the sole and primary heart disease death rate in the survey was computed for males at each age. These age-specific ratios were then multiplied by the corresponding age-specific death rates among male patients with heart disease as obtained in 4 (a).

(c) Since no attempt was made in the National Health Survey to cover the sickness experience of persons in resident institutions, a correction based upon the ratio of total heart disease death rates in the United States to total survey heart disease rates was considered to be too great. Consequently, a further adjustment was made, reducing the death rates among heart disease patients obtained in 4 (b) by the proportion of all United States heart disease deaths at each age occurring outside of resident institutions. This adjustment was made in order that the statistics on mortality among heart disease patients might be more comparable to those on prevalence of heart disease, which, owing to the nature of the survey, were restricted to prevalence for persons outside of resident institutions.

The year 1945 was the only year for which tabulations of deaths by age, inside and outside of resident institutions, were available. Therefore, data for this year were used to make the above adjustment.

The rates adjusted thus were then finally adopted as the male, age-specific death rates among heart disease patients outside of resident institutions.

5. The adjusted rates of 4 (c) were then plotted on arithmetic paper. The same centering points were used as in step 1. A smooth curve passing through the points was drawn. The values were read off for each birthday from 1 to 90 years and posted in the fourth column of the table mentioned in steps 1, 2, and 3. This was called the q'_x column.

6. The following formula was used to obtain i_x values:

$$i_x = \frac{l'_x q'_x + (l'_{x+1} - l'_x)}{1 - \frac{1}{2} q'_x}$$

The i_x values are the expected number of new cases of heart disease acquired by the cohort during a specified year of life. This formula makes use of the assumption that the persons acquiring heart disease between the xth and $x+1$st birthday were exposed to the risk of death characteristic of other persons with heart disease of that same age for an average of one-half year before reaching the $x+1$st birthday.

7. The male L_x values of the 1939–41 life table were posted. An incidence rate of heart disease among males outside of resident institutions was obtained by dividing the total of the i_x values in each 5-year age group by the corresponding total of the L_x values, the latter representing person-years lived by the cohort in the specified age interval.

8. Other steps in the computations for functions shown in table 2a have been explained in the text. The operations described in steps 1–7 are identical with those used for females with heart disease, and for males and females with hypertension and nephritis.

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

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UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED APRIL 8, 1950

For the current week in the Nation, reported cases of influenza continued to decline when compared with the preceding week, from 19,951 to 15,618. For the corresponding week last year 2,658 cases of influenza were reported. The cumulative total for the first 14 weeks of this year is 208,190 which may be compared with the corresponding total of 58,429 for the same period in 1949 and 242,601 for 1947, the highest during the last 5 years. The corresponding 5-year (1945–49) median is 124,010.

Of the 208,190 total cases of influenza reported in the United States this year, 4 States reported 157,187 as follows: Arkansas, 11,237; Virginia, 42,104; West Virginia, 11,907; and Texas, 91,939.

Cumulative figures for this calendar year exclude 43,536 delayed reports of influenza from Kentucky and 4,000 from Jones County, Iowa, which were estimated by special surveys.

The following States reported relatively large increases for the current week over the preceding week: Connecticut (4 to 24), Michigan (7 to 37), Minnesota (2 to 25), Nebraska (8 to 114), South Dakota (0 to 11), Maryland (67 to 175), and Utah (3 to 45).

A total of 63 cases of acute poliomyelitis was reported for the current week which includes 22 cases reported in Texas and 12 cases in California. Reported cases of meningococcal meningitis decreased from 118 cases last week to 109 for the current week but remained above the 5-year (1945–49) median of 87. Three cases of Rocky Mountain spotted fever were reported, two in Oregon and one in Oklahoma.

One case of anthrax was reported in New York, and one case of smallpox was reported in Missouri.

A typhoid fever outbreak in Anchorage, Alaska, was reported by telegraph, received April 13 from the Commissioner of Health. Twelve cases in children aged 5 to 10 years were reported and confirmed by laboratory test. This report is incomplete for Alaska and therefore is not shown on the table on the following page.

Telegraphic case reports from State health officers for the week ended April 8, 1950

[Leaders indicate that no cases were reported]

Division and State	Diphtheria	Encephalitis, infectious	Influenza	Measles	Meningitis, meningococcal	Pneumonia	Poliomyelitis	Rocky Mt. spotted fever	Scarlet fever	Smallpox	Tularemia	Typhoid and paratyphoid fever [1]	Whooping cough	Rabies in animals
NEW ENGLAND														
Maine	----	----	37	59	----	25	----	----	6	----	----	----	31	----
New Hampshire	----	----	5	----	----	5	----	----	2	----	----	----	----	----
Vermont	----	----	----	1	----	----	----	----	2	----	----	----	23	----
Massachusetts	6	----	----	378	1	----	----	----	178	----	----	----	116	----
Rhode Island	1	----	2	7	----	7	----	----	4	----	----	----	11	----
Connecticut	1	----	24	19	1	54	----	----	32	----	----	1	98	----
MIDDLE ATLANTIC														
New York	6	----	[2] 18	261	9	355	3	----	[3] 50	----	----	1	154	10
New Jersey	----	----	4	809	3	75	2	----	34	----	----	----	89	----
Pennsylvania	1	----	----	456	4	105	----	----	121	----	----	3	128	1
EAST NORTH CENTRAL														
Ohio	6	----	15	323	7	107	2	----	191	----	----	2	162	12
Indiana	4	----	1	323	3	60	----	----	63	----	----	----	17	----
Illinois	----	1	3	386	8	104	1	----	76	----	1	----	63	4
Michigan	3	3	37	2, 255	6	86	3	----	186	----	----	2	219	6
Wisconsin	----	----	329	527	20	27	1	----	90	----	----	1	151	----
WEST NORTH CENTRAL														
Minnesota	1	----	25	63	3	7	----	----	20	----	----	1	25	1
Iowa	----	----	1	469	2	2	3	----	4	----	----	----	16	15
Missouri	----	----	12	29	1	4	----	----	8	1	1	----	24	----
North Dakota	----	----	71	14	----	149	----	----	----	----	----	----	----	----
South Dakota	----	2	11	48	1	1	----	----	14	----	----	----	----	----
Nebraska	----	----	114	92	----	16	1	----	44	----	----	----	14	----
Kansas	2	----	3	35	----	8	1	----	13	----	----	----	33	1
SOUTH ATLANTIC														
Delaware	----	----		9	1	----	1	----	4	----	----	----	1	----
Maryland	6	----	175	21	2	53	----	----	30	----	----	----	34	----
District of Columbia	----	----	3	71	----	8	1	----	4	----	----	1	3	----
Virginia	2	----	2, 993	81	10	134	----	----	21	----	----	----	48	1
West Virginia	3	----	847	301	1	12	----	----	9	----	----	2	61	5
North Carolina	5	----	----	158	----	----	----	----	17	----	1	1	25	----
South Carolina	6	----	220	107	----	4	----	----	1	----	----	----	2	6
Georgia	2	----	99	136	2	15	----	----	4	----	2	1	20	9
Florida	4	----	22	225	2	15		----	1	----	----	3	6	----

Telegraphic case reports from State health officers for the week ended April 8, 1950—Continued

Division and State	Diphtheria	Encephalitis, infectious	Influenza	Measles	Meningitis, meningococcal	Pneumonia	Poliomyelitis	Rocky Mt. spotted fever	Scarlet fever	Smallpox	Tularemia	Typhoid and paratyphoid fever [1]	Whooping cough	Rabies in animals
EAST SOUTH CENTRAL														
Kentucky	5	----	[4] 727	322	3	27	----	----	29	----	----	----	67	9
Tennessee	6	----	358	213	2	----	1	----	31	----	----	2	39	10
Alabama	3	----	488	20	1	66	1	----	5	----	----	3	3	14
Mississippi	7	----	69	131	1	37	1	----	6	----	1	----	8	6
WEST SOUTH CENTRAL														
Arkansas	1	----	1,617	71	1	99	1	----	5	----	2	----	44	4
Louisiana	5	----	6	5	1	41	----	----	8	----	----	1	9	----
Oklahoma	1	----	786	6	2	45	----	1	15	----	1	1	25	5
Texas	17	2	5,735	512	5	597	22	----	33	----	2	4	215	35
MOUNTAIN														
Montana	1	----	85	100	----	1	----	----	12	----	2	1	----	----
Idaho	----	----	215	16	----	----	----	----	12	----	----	----	73	----
Wyoming	----	----	2	26	----	----	----	----	1	----	----	----	1	----
Colorado	----	----	26	70	----	46	----	----	18	----	----	----	65	10
New Mexico	----	----	----	11	----	5	1	----	2	----	----	----	1	----
Arizona	2	----	250	54	----	31	1	----	13	----	----	1	53	----
Utah	----	----	45	395	----	7	----	----	2	----	----	----	26	----
Nevada	----	----	4	1	----	----	----	----	----	----	----	----	----	----
PACIFIC														
Washington	----	----	68	54	2	2	----	----	38	----	----	2	38	----
Oregon	----	----	21	8	----	17	2	2	12	----	----	----	20	----
California	9	----	42	531	4	33	12	----	86	----	----	6	112	2
Total	116	8	15,618	10,209	109	2,492	63	3	1,557	1	13	40	2,373	166
Median, 1945–49	214	6	2,658	25,842	87	----	32	----	2,465	3	18	61	2,019	----
Year to date 14 weeks	2,126	175	[5] 208,190	107,314	[6] 1,339	36,290	1,326	15	24,882	19	300	642	36,218	2,168
Median, 1945–49	4,001	109	124,010	225,048	1,200	----	546	6	39,437	68	277	631	30,757	----
Seasonal low week ends	(27th) July 9	----	(30th) July 30	(35th) Sept. 3	(37th) Sept. 17	----	(11th) Mar. 18	----	(32d) Aug. 13	(35th) Sept. 3	----	(11th) Mar. 18	(39th) Oct. 1	----
Since seasonal low week	6,397	----	[5] 238,720	126,444	[6] 2,252	----	189	----	41,321	39	----	132	57,754	----
Median, 1944–45 to 1948–49	11,567	----	167,568	259,994	2,172	----	88	----	64,909	118	----	157	56,123	----

[1] Including cases reported as salmonellosis.
[2] New York City only.
[3] Including cases reported as streptococcal sore throat.
Anthrax: New York 1 case.
Alaska: Influenza 32, pneumonia 2, scarlet fever 3, whooping cough 6.
Hawaii: Measles 2, poliomyelitis 1.

[4] Estimated.
[5] Includes 1,861 estimated cases reported by Kentucky for the 3-week period ended April 8.
[6] Deduction, Arkansas, week ended April 1, one case.

PLAGUE INFECTION IN GRANT COUNTY, WASH.

Under date of April 4, 1950, plague infection was reported proved in 233 fleas as follows: 148 *Megabothris cladtoni*, 58 *Monopsylla wagneri*, 26 *Meringis shannoni*, and 1 *Monopsylla eumolpi* taken from 36 sagebrush voles, *Lagurus curtatus* and 93 fleas, *Monopsylla eumolpi*, taken from 38 chipmunks, *Eutamias minimus*. These specimens were collected on March 23, 1950, 3 miles east of Ephrata in Grant County.

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—January 1950.—Certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Panama City		Colon		Canal Zone		Outside the zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	5				5		1		11	
Diphtheria	2								2	
Dysentery:										
Amebic	1				1				2	
Bacillary					5				5	
Food poisoning, bacterial					[1] 200				[1] 200	
Hepatitis, infectious					1				1	
Malaria [2]	3				4		60		67	
Measles			26		99				125	
Mumps	2				34		1		37	
Pneumonia		9		4	22	3			[3] 22	16
Scarlet fever							1		1	
Tuberculosis		17		10	3	1			[3] 3	28
Typhoid fever							1		1	
Whooping cough	15		1		21		21		58	
Yellow fever								1		1

[1] The outbreak occurred following a New Year's Eve supper.
[2] Includes two recurrent cases.
[3] Reported in the Canal Zone only.

NOTE.—Cases are listed by place of residence except when place of infection is known.

DEATHS DURING WEEK ENDED APRIL 8, 1950

	Week ended Apr. 8, 1950	Corresponding week 1949
Data for 92 larges cities of the United States:		
Total deaths	9,616	9,366
Median for 3 prior years	9,639	
Total deaths, first 14 weeks of year	137,203	136,370
Deaths under 1 year of age	637	596
Median for 3 prior years	707	
Deaths under 1 year of age, first 14 weeks of year	8,663	9,157
Data from industrial insurance companies:		
Policies in force	69,813,915	70,467,744
Number of death claims	11,149	13,506
Death claims per 1,000 policies in force, annual rate	8.3	10.0
Death claims per 1,000 policies, first 14 weeks of year, annual rate	9.8	9.8

FOREIGN REPORTS

CANADA

Provinces—Notifiable diseases—Week ended March 25, 1950.—Cases of certain notifiable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Newfoundland	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox			12	10	285	190	26	36	48	117	724
Diphtheria					6	1		1			8
Dysentery:											
Amebic							1				1
Bacillary					2	4	4			1	11
Encephalitis, infectious						1					1
German measles			138		18	620		38	140	397	1,351
Influenza			20			578	3	2			603
Measles			7	473	609	389	15	29	18	251	1,791
Meningitis, meningococcal					2						2
Mumps	1		113	9	133	473	4	98	104	379	1,314
Poliomyelitis						1					1
Scarlet fever	4		10	5	65	37	5	3	71	5	205
Tuberculosis (all forms)	13		6	12	114	26	38	7	105	56	377
Typhoid and paratyphoid fever	1				3				1	2	7
Undulant fever					5	1	1		1	1	9
Venereal diseases:											
Gonorrhea	4	1	9	14	82	48	31	9	24	148	370
Syphilis	3	1	1	7	65	26	3	4	1	14	125
Whooping cough			10		120	39	3			59	231

CUBA

Habana—Notifiable diseases—4 weeks ended January 28, 1950.—Certain notifiable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Chickenpox	9		Scarlet fever	1	
Diphtheria	10	1	Tuberculosis		1
Malaria	2		Typhoid fever	7	
Measles	1				

Provinces—Notifiable diseases—4 weeks ended January 28, 1950.—Notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana [1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	3	16	11	24	1	20	75
Chickenpox		14		1	1		16
Diphtheria	1	15	1			1	18
Leprosy		4					4
Malaria	2	1			1	22	26
Measles		1		6	1		8
Poliomyelitis					1		1
Scarlet fever		1					1
Tuberculosis	2	17	4	13	3	11	50
Typhoid fever	2	10	4	9	2	20	47
Whooping cough		13	2				15
Yaws						1	1

[1] Includes the city of Habana.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From consular reports, international health organizations, medical officers of the Public Health Service and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

(Cases)

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place	January-February 1950	March 1950—week ended—			
		4	11	18	25
ASIA					
Burma			2	3	
Rangoon				1	
India	[1] 17,398	[2] 1,802	[2] 1,522	[2] 680	
Calcutta	956	135	199	253	312
Cocanada	2				
Cuddalore	17	3	5	1	
Madras	8	1	1	1	
Mangalore	(3)				
Masulipatam	45	1			
Negapatam	53	4	5	5	
Tellicherry	27				
Tuticorin	25				
Indochina		1	5		
Cambodia			5		
Cochinchina		1			
Rachgia		1			
Pakistan	[4] 2,052	4	4	6	11
Chittagong		4	4	6	11
Dacca	11				

[1] Includes imported cases. [2] Preliminary figures. [3] Report of 14 cases of cholera in Mangalore for the week ended Feb. 11, 1950 (see Public Health Reports for Mar. 31, 1950, p. 456) was in error. No report of cholera in Mangalore has been received so far this year. [4] For the month of January 1950 only.

PLAGUE

(Cases; P=present)

AFRICA					
Belgian Congo	3				
Costermansville Province	2				
Stanleyville Province	1				
Madagascar	24		[1] 2	[2] 2	
Union of South Africa	4				
Orange Free State	[3] 2				
ASIA					
Burma	55	2	2	4	
Bhamo	[4] 1				
Yenangyaung	10				
China:					
Chekiang Province	[5] 4				
Wenchow	[5] 4				
Kwangsi province	[5] 63				
Kwangtung Province	15				
India	15,461	[6] 2,079	[6] 393	[6] 865	
Indochina (French):					
Annam	17	3	4	5	1
Cambodia	4		5		
Laos	1	1			
Java	226	12	11	2	
Pakistan	[7] 1				
Thailand (Siam)	36	8	2	4	
SOUTH AMERICA					
Ecuador	4				
Loja Province	4				
Peru	2				
Piura Department	2				

[1] Mar. 1-10, 1950. [2] Mar. 11-20, 1950. [3] Suspected. [4] Imported. [5] Deaths. [6] Preliminary figures. [7] In Karachi, imported.

SMALLPOX

(Cases; P=present)

Place	January-February 1950	March 1950—week ended—			
		4	11	18	25
AFRICA					
Algeria	24	-	[1] 2	-	-
Belgian Congo	352	-	-	-	-
British East Africa:					
Nyasaland	134	23	12	-	-
Tanganyika	27	-	-	-	-
Cameroon (British)	217	-	-	-	-
Cameroon (French)	12	-	[1] 3	[2] 2	-
Dahomey	135	15	14	-	-
Egypt	2	-	-	-	-
Eritrea	-	-	1	-	-
French Equatorial Africa	264	-	-	-	-
French West Africa: Haute Volta	44	-	[1] 5	[2] 25	-
Gambia	-	1	1	2	-
Gold Coast	1	-	-	-	-
Ivory Coast	148	-	[1] 131	[2] 26	-
Libya	2	-	-	-	-
Mauritania	1	-	-	-	-
Morocco (French)	-	-	[1] 1	-	-
Mozambique	51	-	-	-	-
Nigeria	3,755	[3] 18	[3] 13	[3] 11	[3] 15
Niger Territory	336	-	[1] 43	-	-
Rhodesia:					
Northern	1	-	-	-	-
Southern	113	-	-	-	-
Senegal	2	-	-	-	-
Sierra Leone	2	-	-	-	-
Sudan (Anglo-Egyptian)	20	3	1	-	3
Sudan (French)	39	-	[1] 5	-	-
Togo (French)	23	-	[1] 5	[2] 4	-
Union of South Africa	216	P	P	P	-
ASIA					
Afghanistan	61	-	-	-	-
Arabia	232	5	19	10	-
Bahrein Islands: Bahrein	8	-	-	-	3
Burma	2,965	286	282	216	-
China	298	12	25	30	19
India	24,291	3,937	3,034	2,021	[4] 612
Indochina (French)	181	5	23	11	11
Indonesia:					
Java	243	34	37	16	57
Sumatra	[5] 34	-	1	1	-
Iran	77	-	-	-	-
Iraq	48	4	6	5	9
Israel	15	-	-	-	-
Japan	3	-	-	1	-
Korea (Southern)	[6] 270	-	-	-	-
Lebanon	[7] 1	-	-	-	-
Pakistan	1,238	[4] 13	[3] 3	[4] 13	[4] 7
Palestine	[6] 63	-	-	-	-
Syria	8	2	3	-	-
Thailand (Siam)	420	6	7	8	-
Transjordan	[6] 18	-	-	1	-
Turkey (See Turkey in Europe).					
EUROPE					
Great Britain:					
Scotland: Glasgow	-	-	-	-	[8] 8
Turkey	5	-	-	-	-
NORTH AMERICA					
Mexico	41	-	[9] 18	-	-
SOUTH AMERICA					
Argentina	135	2	6	17	-
Brazil	16	2	-	-	-
Chile	-	-	-	-	([10])
Colombia	41	5	-	-	-
Ecuador	100	-	-	-	-
Venezuela	19	-	-	-	-

[1] Mar. 1–10, 1950. [2] Mar. 11–20, 1950. [3] In Lagos only. [4] In ports only. [5] Includes suspected cases. [6] For the month of January 1950. [7] Imported. [8] Mar. 5–28, 1950. Includes 4 suspected cases. [9] In Mexico City, Feb. 26–Mar. 11, 1950. [10] Information dated March 31, 1950, reported an outbreak of a mild form of smallpox in the general area of Talca and Concepcion. One hundred thirty-three known cases had been reported.

TYPHUS FEVER*

(Cases; P=present)

Place	January-February 1950	March 1950—week ended— 4	11	18	25
AFRICA					
Algeria	35		[1] 5		
Basutoland	16	4			
Belgian Congo	11				
Egypt	19		1		
Eritrea	7		1		
Ethiopia	23				
Gold Coast	2				
Libya	32		4	2	2
Madagascar	1				
Morocco (French)	2				
Morocco (International Zone)	1				
Nigeria	1				
Sudan (Anglo-Egyptian)	4				
Tunisia	11		[1] 4		
Union of South Africa	17	P			
ASIA					
Afghanistan	67				
Burma	7		1		
China	[2] 4		1		
India	5				
Indochina (French)	1	1		2	1
Indonesia:					
Java	2				
Sumatra	1				
Iran	46				
Iraq	[2] 14	6	4	1	7
Japan	495	[3] 39	[3] 28	[3] 10	
Korea (Southern)	[2] 341				
Pakistan	21	2	1	5	2
Straits Settlements	[2] 3				
Syria	1	2			1
Transjordan	3	4	5		
Turkey (See Turkey in Europe).					
EUROPE					
France	1				
Germany (British Zone)	[2] 2				
Germany (French Zone)	2				
Germany (United States Zone)	1				
Great Britain: Island of Malta	[4] 2				
Greece	1				
Hungary	1				
Italy	15				
Sicily	7				
Poland	37				
Spain	3				
Turkey	64	13	5	3	6
Yugoslavia	34	15			
NORTH AMERICA					
Costa Rica [4]	1	1			1
Guatemala [4]	4				
Jamaica	3				
Mexico [2]	23		4	2	
Puerto Rico	2				
SOUTH AMERICA					
Argentina	[4] 1				
Chile	29	4	3	3	5
Colombia	57	12			
Ecuador	[2] 33	1	1		
Venezuela [4]	1			1	1
OCEANIA					
Australia	20	2	2		

*Reports from some areas are probably murine type, while others include both murine and louse-borne types.

[1] Mar. 1-10, 1950. [2] Includes murine type. [3] In Tokyo and Yokohama. [4] Murine type.

YELLOW FEVER

(C=cases; D=deaths)

Place		January-February 1950	March 1950—week ended—			
			4	11	18	25
AFRICA						
French Equatorial Africa	C	1				
Port Gentil	C	[1] 1				
Gold Coast	C	5	1			1
Ankobra Ferry	D	1				
Bisiasi	D					[1] 1
Kade	C		1			
Oda Area:						
Akwatia	C	[1] 3				
Atiankama	C	1				
Sierra Leone	C	1				
Koinadugu District	C	1				
NORTH AMERICA						
Panama:						
Colon	D	1				
SOUTH AMERICA						
Bolivia:						
Chuquisaca Department	C	[2] 70			[3] 850	

[1] Suspected. [2] In Azero Province, with 15 deaths. [3] Reported in Azero Province during the period Jan. 1-Mar. 14, 1950, with 230 deaths.

Brucellosis Congress in Washington

The third Inter-American Congress on Brucellosis will be convened in Washington, D. C., November 6 to 10, 1950, by the Pan American Sanitary Bureau, Regional Office of the World Health Organization.

The first of the two previous congresses was held in Mexico in 1946 and the second, in Argentina in 1948. The Pan American Sanitary Bureau is sponsoring the congress in conjunction with the Inter-American Committee on Brucellosis and in cooperation with the Committee on Public Health Aspects of Brucellosis of the National Research Council.

The congress will discuss scientific works relating to brucellosis and exchange ideas on the techniques of combating this disease with the objectives of establishing uniform methods of diagnosis in accordance with the recommendations of the 12th Pan American Sanitary Conference (Caracas, 1947), and of considering measures for the treatment and control of the disease.

The topics for discussion at the congress come under five general headings: bacteriology; veterinary research; research on human brucellosis; epidemiology; and control.

Studies will be presented by specialists on the various aspects of brucellosis, a disease which constitutes a real threat to public health and is a serious medical and veterinary problem throughout the Americas.