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## Statistical Studies of Heart Diseases

### II. Important Factors in Heart Disease Mortality Trends

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This is the second of a series of papers dealing with the statistics of heart disease morbidity and mortality. The papers are the result of a Public Health Service study carried on jointly by the National Office of Vital Statistics and the Division of Public Health Methods with the cooperation of the Division of States Relations.

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The first paper of this series described the manner in which mortality from diseases of the heart has been increasing in relation to other causes of death (10). It also pointed out that this relative increase was expected to continue owing to a further aging of the population. That the increase was not solely due to age changes in the population was demonstrated by means of age-adjusted death rates for heart disease and other causes of death. When the leading causes of death in 1900 and 1940 in a group of 10 States and the District of Columbia were arranged in order of magnitude in terms of these age-adjusted rates, heart disease moved from third to first place in the 40-year period; nephritis from seventh to fourth; intracranial lesions of vascular origin from fourth to third; cancer from eighth to second; and diabetes from eighteenth to eighth place. On the other hand the major communicable diseases declined from higher to lower rank.

The trend of heart disease mortality is examined here in greater detail in the light of the various limitations of official statistics of heart disease for the United States between 1900 and 1945. The influence of each of the limiting factors on the trend is discussed, and, wherever possible, the trend is then reexamined after some allowance has been made for the disturbing factor.

The group of heart diseases included under International List titles 90-95 (1938 revision) are considered as a whole. Excluded from the analysis are certain specific cardiac conditions, namely, congenital heart defects, acute rheumatic heart disease, any form of syphilitic

heart disease, and hyperthyroidism which are classified elsewhere in the International List.<sup>1</sup> The major etiologic types of heart disease included are heart disease of infectious origin (other than that specified as syphilitic or acute rheumatic), functional heart disease without mention of organic lesion, chronic myocarditis and coronary artery disease associated with hypertension and/or arteriosclerosis. Of these the last two account for more than three-quarters of the deaths attributed to the whole group.

### *The expanding registration area*

In the interpretation of mortality trends for the United States it is necessary to consider that comparable statistics for the entire country were not available until 1933. The Bureau of the Census began the annual collection of mortality statistics in 1900 when there were 10 States and the District of Columbia in the death-registration area. There were also in the registration area a number of cities located in nonregistration States, but statistics for these cities have been excluded from all series published in this study. Hence, we can speak of the death-registration States of any particular year as the group admitted to the death-registration system by the beginning of that year.

The 11 jurisdictions comprising the death-registration States of 1900 were located in northeastern United States. The States farthest west were Indiana and Michigan. Farthest south was the District of Columbia. Altogether they contained 26.2 percent of the inhabitants of the country in 1900. The proportion of the population living in urban areas and the proportion of white persons was considerably higher in these States than for the country as a whole.

By 1910 the number of registration States had increased to 21, counting the District of Columbia. It then included California, Washington, Colorado, Montana, Utah, and several more States in the northeastern and north central part, and Maryland in the middle Atlantic area. It still covered none of the populous southern States and no State from the corn belt or from the southwestern part of the country. Just over a half (51.4 percent) of the total population was in this group of registration States, but only about an eighth (12.3 percent) of the nonwhite population was included.

Ten years later the country was far better represented, since 8 States from the south Atlantic and south central portions of the country, 2 from the corn belt, 3 from the eastern half of the upper Mississippi Valley, and Oregon on the west coast had been added,

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<sup>1</sup> The heart disease deaths included in the regular annual tabulations of mortality are only those in which heart disease was the primary cause of death. Deaths in which heart disease was secondary to a closely related cause, such as chronic nephritis, are discussed in a later section of this paper.

making a total of 35 out of the 49 jurisdictions and containing 80.9 percent of the total population and 66.1 percent of the nonwhite population. But the Southwest and the Arkansas-Oklahoma area were still not represented.

The death-registration area covered the entire United States by 1933. However, in all trend statistics on mortality in the registration States<sup>2</sup> for the period 1900-1933, there is a factor of changing population base that must be taken into consideration. In the case of heart disease this factor is particularly important. The level of heart disease mortality is strongly influenced by the proportion of older persons in the population and also by the proportion of the population living in urban areas. The higher either of these proportions is, the higher the crude heart disease death rate can be expected to be.

From the description of the expanding registration area given above it may be seen that, in general, the tendency was for the population included to become more youthful and more rural and to include a larger proportion of the Negro population as the States of the south, middle west, and southwest were added.<sup>3</sup> There were other changes in the composition of the population as the registration area grew, but these three are, perhaps, the most important from the point of view of heart disease.

With these facts in mind, the 40-year trend of heart-disease death rates in the death-registration States and in each of three constant areas may be examined. Figure 1 shows the trend of the rates adjusted for age differences, using the total population of the country in 1940 as a standard (see note). One of the three major variables in

NOTE—These rates were adjusted by the so-called indirect method. For a description of this method, which usually gives results not greatly different from those obtained by the "direct method," see "Vital Statistics Rates in the United States, 1900-1940," by Linder and Grove, U. S. Bureau of the Census, 1943, pp. 69-71. The "direct method" was used in the first paper of this series. This method has the advantage of being a little more easily understood, but it requires knowledge of the deaths distributed by age for each year or area. Where such statistics are impossible or very difficult to compile, the indirect method is often used. Hence, in all age-adjusted rate comparisons discussed in this paper involving the death-registration States of 1910 or 1920 and also in comparisons involving the States of 1900 where a cause of death other than heart disease was included, the indirect method was used. Various tests have indicated that no different conclusions would have been reached had one or the other of these indices been used throughout.

<sup>2</sup> In this paper a time series of death rates for the "registration States" refers to statistics which in any one year are based upon all States that were in the registration area in that year. A time series of rates for the "States of 1900," on the other hand, refers to data which in any one year come only from those States which were in the area in 1900.

<sup>3</sup> In 1930 the median age of the urban population of the United States was 28.4 years as contrasted with 25.8 years for the rural-nonfarm and 21.6 years for the rural-farm population. The corresponding figures in 1940 were 31.0, 27.7 and 24.4 years.

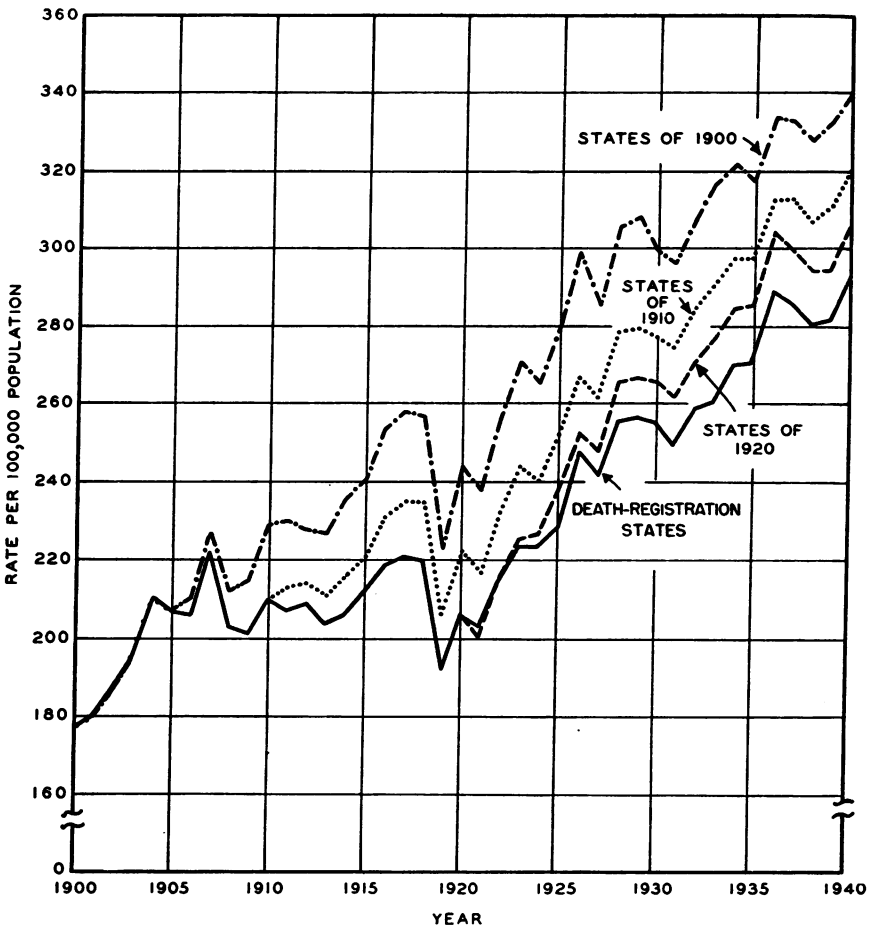


Figure 1. Age-adjusted death rate for all forms of heart disease (adjusted by indirect method); Death-registration States (1900-1940); States of 1900 (1900-1940); States of 1910 (1910-1940); and States of 1920 (1920-1940).

the changing population base has been held constant. Nevertheless, there are considerable differences between the rates for the three constant areas and those for all registration States. Since the rates for the group of States in the death-registration area in 1900 are consistently higher than those for the 1910 group, and these in turn are higher than the 1920 group, and the total group is the lowest of all, it is apparent that, even with age of the population held constant, the addition of States to the registration area tended to lower the heart-disease death rate. It is highly probable, therefore, that had a death rate for the entire country been available in 1900, it would have been considerably lower than that for the death-registration States; and, if statistics were obtainable for the entire country for this 40-year

period, they would reveal that the upward trend of heart-disease mortality has been steeper than the figures for the death-registration States would indicate, other things being equal. Whether the slope of that hypothetical line would be greater or less than those for the three fixed areas shown in figure 1 can only be surmised; the important point is that, when the factor of the growing registration area is considered by itself, the time series of rates for the registration States probably understates the rate of increase in heart-disease mortality.

This relationship between the trends of the death rates from diseases of the heart in terms of crude and age-adjusted rates between 1900 and 1940 is further illustrated in figure 2 in which the rates for the original death-registration States alone are compared with those for all registration States. Since no States were added to the registration area during the period 1900-05, the two series are identical until 1906. In both the fixed and the changing area the death rates adjusted for age show a slower rate of increase than the crude death rates.

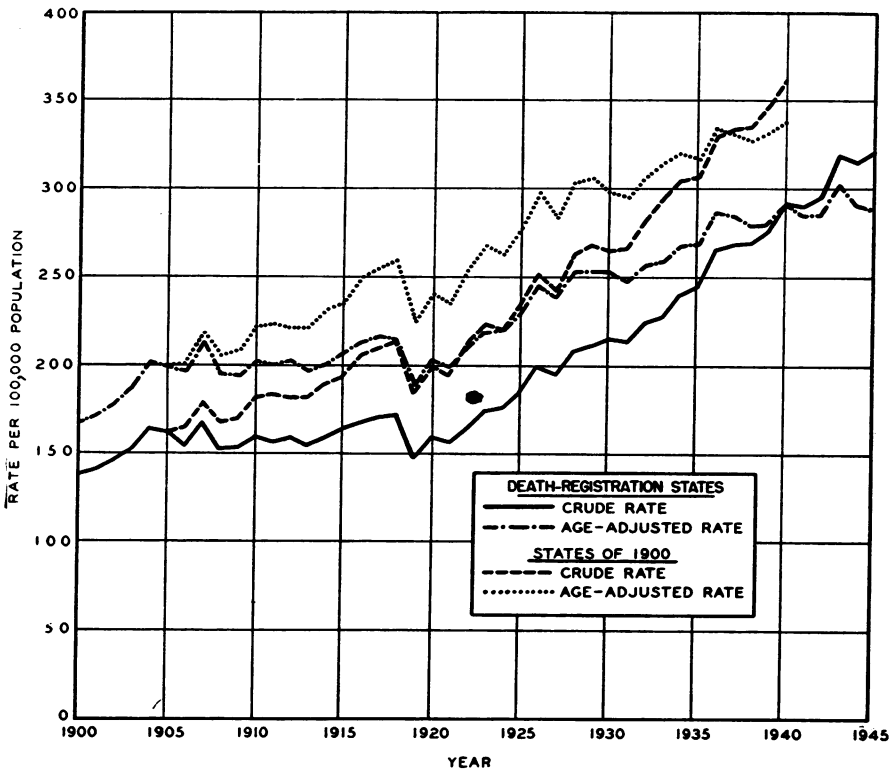


Figure 2. Death rates (crude and age-adjusted by the direct method) for all forms of heart disease: Death-registration States (1900-1945), and States of 1900 (1900-1940).

### *Average annual rate of increase in death-registration States*

Inspection of the graph of crude heart disease death rates for the registration States in figure 2 discloses an apparent discontinuity in the curve between 1918 and 1919. Before that time the rate was increasing only rather gradually. It was also somewhat irregular, partly because of the relatively small number of States in the registration at that time. From 1920 on, however, the trend was regularly and decidedly upward. On account of this discontinuity and also because mortality from heart disease was abnormal during and immediately after the great influenza epidemic of 1918, it was considered advisable in describing these trends in quantitative terms to determine separately the rate of increase for the years 1900-17 and for the years 1920-45 and to omit the two intervening years. On the assumption of a constant proportional rate of increase, the regression coefficients of the logarithms of the crude death rates in each of the two periods was calculated. During the earlier period the average annual percentage increase was 0.8 percent per year while in the later period the corresponding figure was 3.0 percent.

Mere inspection of the chart indicates that the over-all rate of increase in heart disease mortality in all registration States was reduced by adjusting the death rates for differences in the age composition of the population. However, the regression coefficients of the logarithms of the adjusted death rates yield additional information. The average annual percentage increase for the adjusted series in the 1900-17 period is very little different, being 1.0 percent per year as compared with the 0.8 percent for the crude rate. But the average for the later period is 1.5 percent per year, only one-half of the 3.0 percent for the unadjusted rates. The latter difference is statistically significant but the former is not. When based upon age-adjusted rates, then, the rate of increase in the post-epidemic period was only one-half percent per year greater than it was before the epidemic.

### *Effect of classification procedures and medical certification*

The marked decline in death rates for the communicable diseases has affected the mortality trend for heart disease in two ways. One of these, the increased probability of survival to an older age with consequent possibility of contracting heart disease, has been discussed previously (10). The other is the "premature" termination of life of cardiac patients through the intervention of other causes of death. This factor affects mortality trends for certain causes of death because of the vital statistics practice of selecting only one cause of death for the regular annual tabulations. For example, in 1917, tuberculosis deaths with heart disease as a concomitant condition represented 2.2 percent of all deaths from heart disease. Because of the decrease in mortality from tuberculosis, this proportion dropped

to 1.9 in 1925 and to 1.2 and 0.8 percent, respectively, in 1936 and 1940. Most of the deaths represented by these proportions would have contributed to the heart disease toll at some future date had not tuberculosis intervened. It follows, therefore, that the decline in tuberculosis mortality has brought about an increase in the recorded mortality from heart disease. If all infectious and parasitic diseases are taken into consideration, the proportion of deaths with heart disease as a secondary cause would, of course, be greater (2.5 percent in 1940 as compared with 0.8 percent given above for tuberculosis deaths only.) However, the decreasing mortality from infectious and parasitic diseases would have approximately the same effect on the slope of the heart disease mortality trend as tuberculosis has.

The changes and developments in medical and statistical practices also have an important bearing on the comparability of the mortality trend for heart disease. There is little question of the great progress made in the clinical diagnosis of heart disease since the beginning of the century, but estimates of the reliability of heart-disease-mortality statistics are available only in special studies in limited areas. Studies of accuracy of diagnosis of heart disease relate to comparisons between clinical and autopsy records, and the fragmentary nature and the limitations of such comparisons do not provide a satisfactory basis for evaluating the accuracy of data on the death returns for the United States.

Heart disease, as a mortality classification, has probably been abused more than any other cause-of-death category. It has frequently been a convenient statistical "wastepaper basket" simply because the physician was hard put to it for a definite diagnosis, particularly when called in at the terminal phase of the illness. There are also problems of inaccurate diagnosis and improper medical certification. Heart disease was probably over-reported as a cause of death during the first two decades of the century in that many deaths were improperly returned as some ill-defined heart disease when actually they were due to an undiagnosed condition other than heart disease. On the other hand, it is probable that a large proportion of deaths certified as due to senility had, in fact, some cardiopathy. With improvements in diagnostic techniques and facilities, there has undoubtedly been an increase in the reporting of cases which previously would have been undetected.

In vital statistics practice of the past half century, causes of death were classified according to the International List of Causes of Death and in the United States according to the Manual of Joint Causes of Death when two or more causes of death were jointly reported. The International List of Causes of Death is revised every 10 years and each revision has resulted in transfers of certain inclusion terms from one rubric to another with or without change in the titles. From the

standpoint of comparability of trend data, these revisions may be serious if the terms involved are reported with any great frequency and if the subclassifications cannot be combined to obtain comparability. Although the heart disease titles and subtitles show additions and transfers of inclusion terms from one rubric to another, most of these shifts have taken place within the various anatomic-pathologic classification of heart disease. Important exceptions to this are the classification of the diseases of the coronary arteries and of diseases involving the cardiorenal system. Prior to 1929, the diseases of the coronary arteries were classified as part of the title "Diseases of the arteries." In the 1929 revision of the International List, all terms relating to diseases of the coronary arteries were transferred and formed a new subdivision of heart disease, "Diseases of the coronary arteries and angina pectoris."

Although diseases of the coronary arteries constitute a numerically important cause of death at the present time, it was not until about 1926 that deaths from the diseases of the coronary arteries began to be recorded with a significant frequency. Halsey, cited by Hedley (7), and Atlanson (1), have pointed out that recent emphasis in the diagnosis of heart disease has been away from the valvular to the myocardial diseases, and more particularly to the coronary vessels which supply the myocardium and in a large measure determine its competency. Levy's review of the clinical and pathological records of the Presbyterian Hospital of New York City for the decade 1920-30 (8) showed that although the incidence of coronary disease in the pathological records was fairly constant (10-12 percent) each year through the decade, there was an increase of 400 percent in the frequency of clinical diagnosis of the various forms of coronary diseases. Levy states that "it was after the publication of the papers of Herrick in 1912 and again in 1919 that interest of the profession in this country was aroused in the problems of acute coronary obstruction, and in the succeeding years clinicians became more alert in recognizing the disturbances in the coronary circulation and recorded them more frequently."

The other significant change in the International List affecting the comparability of heart disease mortality trends was that made in the 1938 revision when diseases involving the cardiorenal system were transferred to the category "Chronic nephritis." The effect of this, and the listing of myocardial failure under ill-defined causes instead of "Diseases of the myocardium, unspecified" in the former classifications, was to decrease the number of deaths assigned to the diseases of the heart in 1940 by 11,614 deaths, or 3 percent of the heart disease total.

Mention has already been made of the selection procedure for determining the cause of death to be tabulated when two or more



causes are jointly reported. The revision of the joint-cause procedures has had an effect additional to the International List revision in disturbing the comparability of time trends. When the Manual of Joint Causes of Death was first published in 1914 (this manual represents joint-cause practice from 1900 to 1924) "valvular heart disease" and "valvular insufficiency" were preferred terms when reported jointly with chronic nephritis, but the terms "valvular lesions" and "valvular stenosis" were not. "Chronic heart disease" was another term with a greater priority weight than "chronic nephritis" while specific terms such as "chronic endocarditis" and "chronic myocarditis" had less weight than chronic nephritis. There was also a difference in the joint-cause weight between the term "chronic nephritis" and "chronic parenchymatous nephritis." Several terms relating to heart disease were preferred over chronic nephritis but "chronic parenchymatous nephritis" took precedence over all heart disease titles. In the 1925 revision of the Manual of Joint Causes of Death, a change was made in the priority weight of chronic heart disease and the valvular heart diseases so that when these causes were reported jointly with chronic nephritis, the primary cause assignment was to chronic nephritis. Also, the 1925 revision eliminated the difference in priority weight between chronic heart disease, chronic endocarditis, and chronic myocarditis as related to chronic nephritis; and between chronic nephritis and chronic parenchymatous nephritis.

These examples illustrate the shifts that can take place among the diseases of the cardiovascular-renal system from changes in the classification procedures. These changes are of particular significance in the interpretation of mortality trends for heart disease because of the close clinical and pathological inter-relationship of cardiac, vascular, and renal diseases. So long as cause-of-death statistics are based upon the concept of counting individuals who die rather than conditions present at the time of death, it is not possible to obtain the exact level of mortality at any period for diseases such as heart disease which occur frequently with other related diseases or conditions.

The extent to which statistical information on heart disease is lost from the primary-cause tabulations may be seen from the table presented below.

	1917	1925	1936	1940
<b>Heart disease:</b>				
Primary cause.....	128, 719	191, 226	341, 350	385, 191
Secondary cause <sup>1</sup> .....	46, 067	81, 513	103, 448	112, 505
Secondary to chronic and unspecified nephritis.....	17, 470	35, 558	45, 696	44, 470
Secondary to other causes.....	28, 597	45, 955	57, 752	68, 035
<b>Chronic and unspecified nephritis:</b>				
Primary cause.....	74, 639	93, 587	102, 704	104, 053
Secondary cause.....	23, 180	23, 424	33, 066	25, 070
Secondary to heart disease.....	10, 013	9, 519	6, 135	4, 518
Secondary to other causes.....	13, 167	13, 905	26, 931	20, 552

<sup>1</sup> Excludes one form of heart disease secondary to other forms of heart disease.

In the death-registration area of 1917, heart disease was selected as the primary cause of death in 128,719 cases and as the secondary cause in 46,067 deaths. If all conditions involving heart disease were being counted in 1917, at least 174,786, or 1.36 times the usually published total, would have appeared in the tabulations. These ratios varied between 1.29 in 1940 to 1.43 in 1925. It is significant that a substantial proportion of deaths involving heart disease as a contributory cause were associated with chronic nephritis and nephritis unspecified. Because of the close physiological and pathological relationship between the cardiac and renal functions, heart disease mortality statistics would be incomplete without taking into consideration mortality from renal diseases, particularly chronic nephritis. Similarly, the vascular diseases should also be included, although in this case the joint-cause priority weights are such that neither heart disease nor nephritis is lost from the tabulations to any great extent as a result of primary cause assignment.

In the presentation of mortality trends, statistics should be compiled in such a way as to minimize the effects of changes in classification and reporting procedures during the time period under consideration. In order to accomplish this, it would be well to consider a broader group of diseases, the diseases of the cardiovascular renal system, rather than to restrict the investigation to heart disease only. In addition, consideration should be given to the inclusion of an ill-defined cause, senility, which has concealed a large group of deaths from heart disease. Were it not for the improvement in reporting over the years with the consequent decline in the senility death rate, it would not be necessary to include this cause in a study of mortality from the cardiovascular-renal diseases.

#### *Trend of mortality for the cardiovascular-renal disease group as a whole*

The crude death rates for heart disease and the other vascular and renal diseases in the death-registration States have been plotted in figure 3 in such a way that the cumulative effect of the addition of other causes can be seen.<sup>4</sup> On this graph there is also shown the course of mortality from diseases of the coronary arteries and angina pectoris since 1930. It might seem that the addition of the causes of death in the "diseases of the coronary arteries" rubric would be sufficient to account for a large part of the observed increase in the heart disease group. However, it was only in the 1930-40 decade that these terms began to assume any numerical importance. It is impossible to say how many deaths there would have been in the category

<sup>4</sup> In this chart and all others that follow the line labeled "All cardiovascular-renal diseases" shows the death rates for a group of causes comprising all forms of heart disease, intracranial lesions of vascular origin and all forms of nephritis. From the year 1930 on, the group also includes arteriosclerosis and idiopathic high blood pressure which were first given separate titles in the International List of Causes of Death in the revision of 1929.

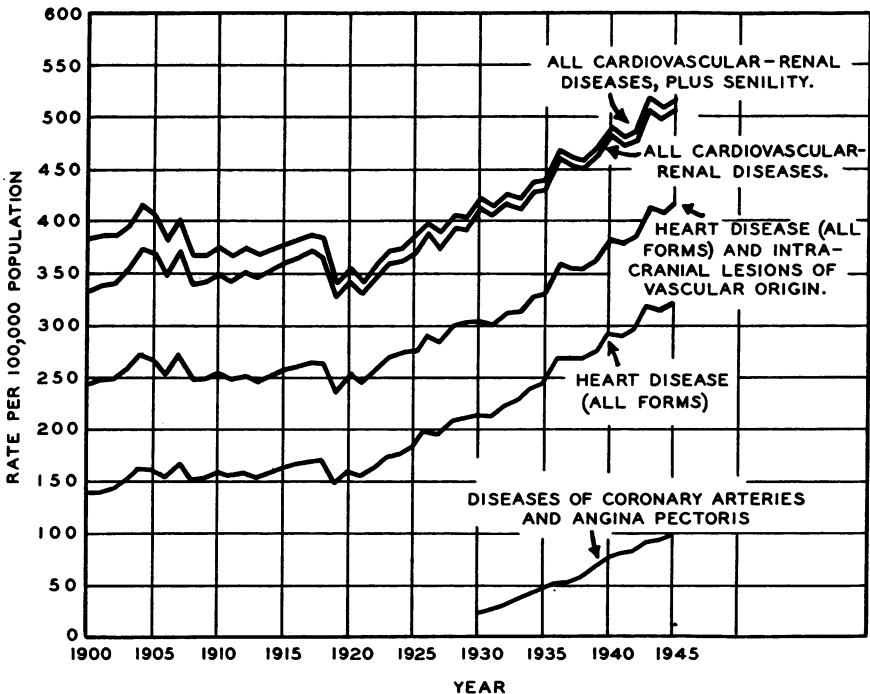


Figure 3. Cumulative crude death rates for all forms of heart disease, cardiovascular-renal diseases, and senility: Death-registration States (1900-1945).

"diseases of the coronary arteries" before 1930, had the title existed as a separate entity before that year, but by 1938 the death rate for this group of causes was 52.2 per 100,000 population, while in 1929, the last year of the old classification, the combined rate for all diseases of the arteries (except aneurysm) and all embolism and thrombosis (except cerebral) was only 25.7 per 100,000 population. The explanation of the remarkable change in the importance of this group of causes probably lies in the rapidly growing use of the term "coronary occlusion" and terms similar to it. These terms were not even listed in the index to the International List before 1938, but there is evidence that they accounted for a large proportion of the deaths that brought the rate for diseases of the coronary arteries up to 71.3 in 1940 and 95.8 in 1945.

In the broad group of causes—cardiovascular-renal diseases and senility—for which crude death rates have been plotted in figure 3, the discontinuity in the trend at about the beginning of the third decade of the century is even more striking than that which was noted in the case of heart disease. In terms of absolute increase the crude rate for the broad group appears to have risen about the same amount since 1920 as the rate for heart disease alone. (The absolute increase from 1920 to 1940 was roughly 160 deaths per 100,000 popu-

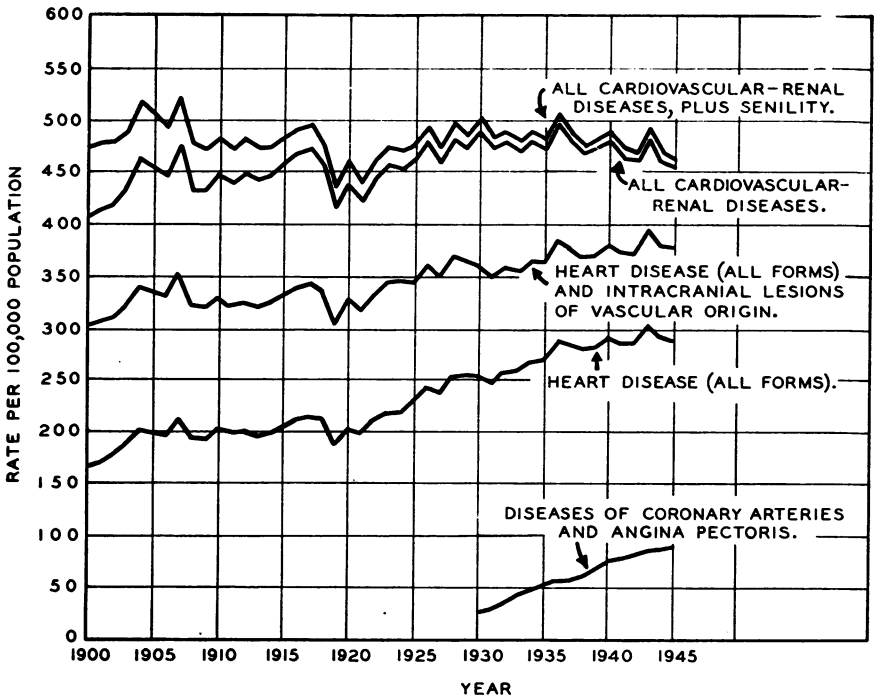


Figure 4. Cumulative age-adjusted death rates (adjusted by the direct method) for all forms of heart disease, cardiovascular-renal diseases, and senility: Death-registration States (1900-1945).

lation.) It follows, therefore, that the proportional rate of increase has been less for the more inclusive group. For heart diseases, it will be remembered, the average annual percentage increase in the crude death rates was found to be about 3.0 percent per year for the period 1920-45. The corresponding figure for the cardiovascular-renal-senility group is 1.4 percent per year.<sup>5</sup>

It was found previously that the age-adjusted heart disease death rate rose with an average annual increment of 1.5 percent during the years 1920 to 1945. The age-adjusted rates for the entire group of cardiovascular-renal diseases and senility (figure 4) indicate that while the rates for heart disease alone seem to have risen rather steadily and smoothly, the mortality for the group of causes that was selected to include all parts of the degenerative cardiovascular-renal complex exhibits no particular trend at all. The regression coefficient for the trend of the broad group, after the rates have been adjusted for age is  $-0.1$  percent per year, a statistically insignificant deviation from zero. Even excluding senility there is little evidence of any trend in the age-adjusted death rate since 1930.

<sup>5</sup> This regression was computed from data in which arteriosclerosis and high blood pressure had been excluded because statistics for those causes were not available for the entire period.

The analysis of the total cardiovascular-renal-senility death rate has been restricted so far to a consideration of the trend in the entire death-registration area, the population of which was previously found to have changed over the 40-year period in a direction associated with lower death rates from heart disease. What can be said of the trend in a fixed group of States? Will age-adjusted death rates for this class of degenerative diseases reveal a secular increase in mortality when the factor of changing population coverage is eliminated?

The original death-registration States undoubtedly have a population that is unfavorable for the diseases considered here, in comparison to the population of the country as a whole. Furthermore, there is no *a priori* reason to suppose that the trend of mortality from cardiovascular-renal conditions is the same in the northeastern part of the country as in other parts. Nevertheless, an examination of the trend for the 10 States and the District of Columbia, comprising the original registration States, does make it possible to free the statistics from

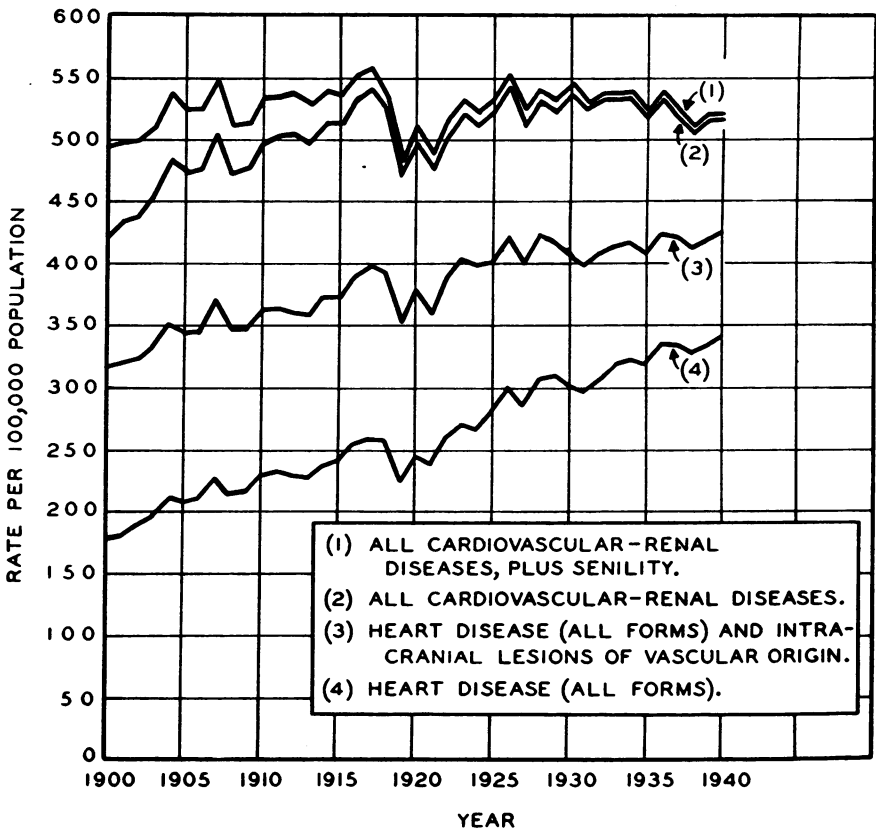


Figure 5. Cumulative age-adjusted death rates (adjusted by the indirect method) for all forms of heart disease, cardiovascular-renal diseases, and senility: Death-registration States of 1900 (1900-1940).

the effect of the alterations in the character of the population brought about by the growth of the registration area. Even if the knowledge of the direction of change in this fixed area does not permit us to draw any conclusions about what was happening in the country as a whole, that knowledge does have an interest *per se*. What inferences one can draw as to the trend of mortality from these causes in the entire country depends upon how much the trends tend to vary from one geographical area to another, a subject which will be discussed in the fourth paper of this series.

In figure 5 age-adjusted death rates for the same group of causes considered above have been plotted for the death-registration States of 1900.<sup>6</sup> As was stated above, the upward trend of the adjusted rate for heart disease is steeper in the fixed areas than in the changing area. The same is true of the rate for heart disease plus intracranial lesions of vascular origin, but when nephritis and senility are also included, there is no more trend apparent than was the case in the changing area (figure 4).

#### *Mortality trend for the cardiovascular-renal disease group at specific ages*

The foregoing analysis makes use of crude and age-adjusted death rates as measures of the trend of mortality. Both of these can be looked upon as averages of the death rates at individual ages. In the crude rates the average is a weighted mean of age-specific death rates with weights that vary from year to year. These weights are, of course, the populations at each age. When age-adjusted rates are computed, an invariant set of population-weights is substituted. As summary figures these averages are valuable, but in statistics of heart disease mortality they tend to conceal some important detail—particularly the widely different trends of the mortality at different ages.

NOTE—The age-specific rates used in this section have not been published in the Appendix tables of this paper owing to lack of space, but most of them may be found in the following places:

For the years 1900–1939: Vital Statistics Rates in the United States, 1900–1940; by Linder and Grove, United States Bureau of the Census, 1943, table 14.

For the years 1940–1945: Specific rates have been published each year in the introduction to volume 1 of Vital Statistics of the United States (published by the Bureau of the Census for 1940–1944 and for 1945 by the Public Health Service). However, the published rates are for different age groupings, and rates for the age groupings shown here are only available in unpublished tables.

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<sup>6</sup> Again it was necessary to make use of the indirect method (see note, p. 1249). Age-adjusted rates for all the registration States were computed both ways and found to give an almost identical picture of trend. It should be noted that the indirect-method rates are not algebraically additive, but the error in treating them as additive, as is done here and in the Appendix table, is very slight.

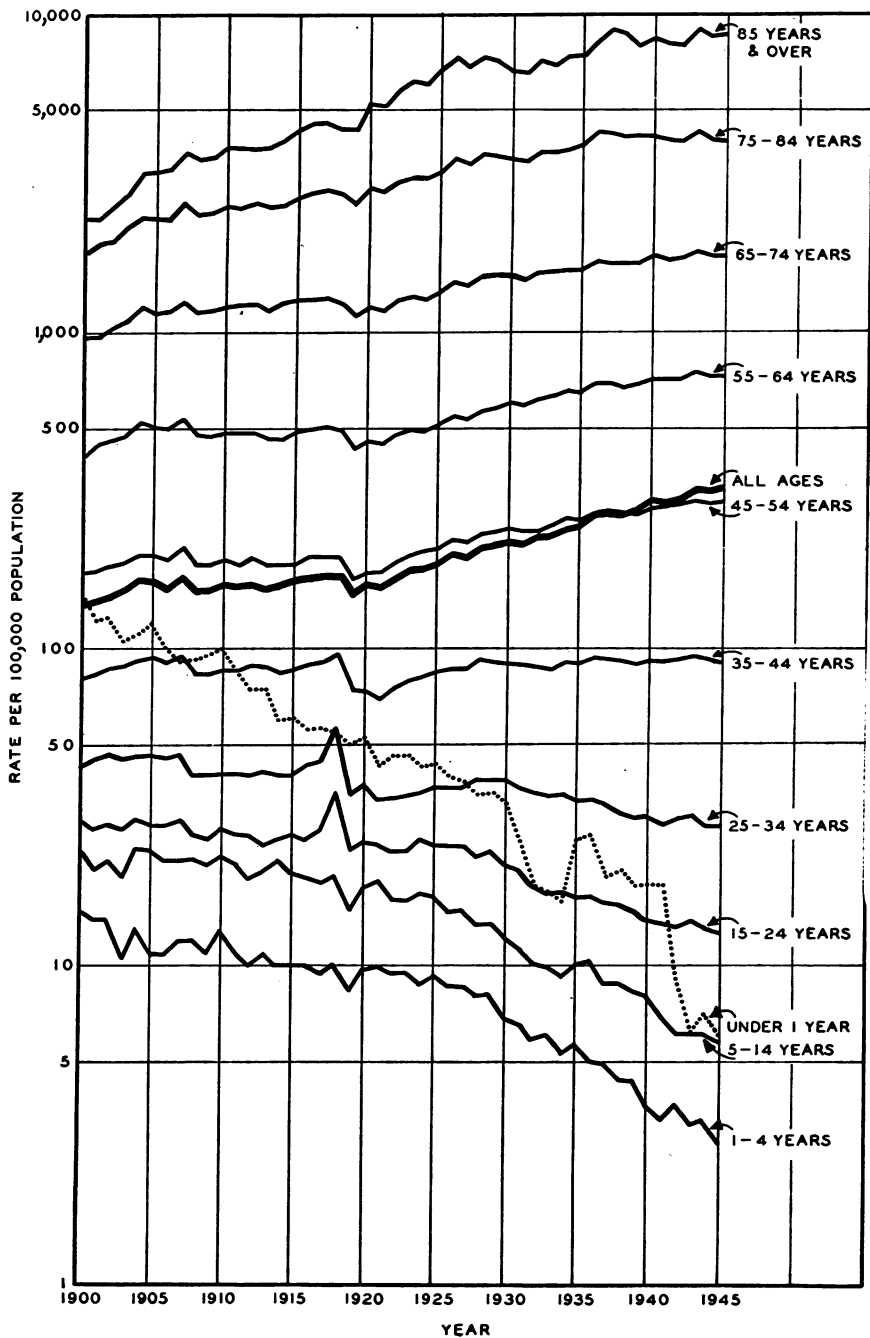


Figure 6. Age-specific death rates for all forms of heart disease (on logarithmic scale): Death-registration States (1900-1945).

In general, the death rate from all forms of heart disease has been falling in the younger age groups and rising at the older ages. This fact is illustrated in figure 6. In this chart, showing trends in the death-registration States from 1900-45 for 11 age groups and for all ages, the age group 35-44 years is the dividing line between the rates that are going up and those that are coming down. When each race-sex subdivision of the population is considered separately, as will be done in a later paper, the dividing line is found to be either at a lower or a higher age, but the general relationship of a trend toward lower rates at the younger ages and toward higher rates for the older ages holds fairly regularly for all segments of the population.

With the exception of infants under one year, the death rate for each successive age group is greater than that for the next younger group. The fact that the infant rate is an exception possibly indicates that many of the deaths included are improperly certified on the death certificate. Had some indication that they were of congenital origin appeared, they would have been classified as congenital malformations of the heart, instead of as one or the other form of acquired heart disease. In any case, these deaths are probably not of the same etiology as those that form the bulk of the heart disease total.

The association that exists in heart disease between the magnitude of the death rate and the direction of the trend explains why both the crude and age-adjusted rates for all ages are increasing despite the fact that mortality from this cause is declining or remaining stationary in three-quarters of the population. In other words, it is the steady

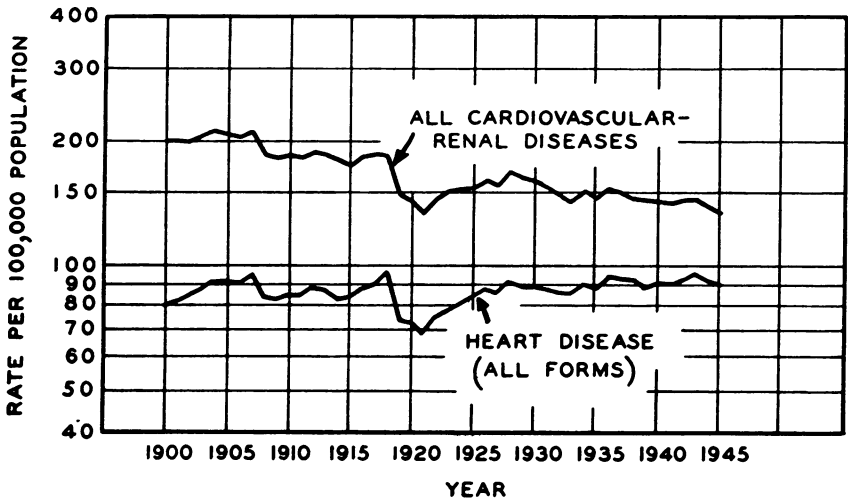


Figure 7. Cumulative mortality at ages 35-44 years (on logarithmic scale) for all forms of heart disease and cardiovascular-renal diseases: Death-registration States (1900-1945).



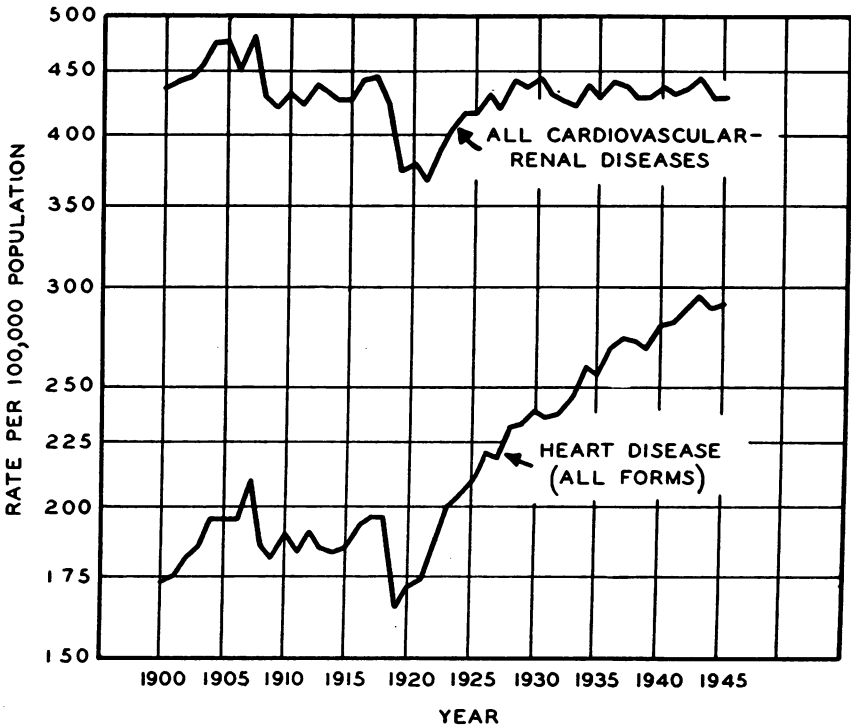


Figure 8. Cumulative mortality at ages 45-54 years (on logarithmic scale) for all forms of heart disease and cardiovascular-renal diseases: Death-registration States (1900-1945).

upward movement of the death rate in only about 27 percent of the population—the 27 percent that is 45 years of age or over—that is solely responsible for the apparent increase in the rate for all ages. Hence, the question arises whether at these older ages the cardiovascular-renal group as a whole does or does not show an increase in death rates. This question is answered for the expanding registration area in figures 7-12.

While the rate for heart disease alone shows little or no trend at 35-44 years, that for all cardiovascular-renal diseases has a distinct downward inclination (figure 7). Senility, the other cause of death included in the discussion above, causes no deaths in this age group and, therefore, does not appear on the graph. At 45-54 years the mortality from heart disease alone has risen quite rapidly since 1920, but the more inclusive group appears to have no consistent trend (figure 8). Senility still contributes nothing to the total. Except for the fact that all the rates are more than twice as high, the same statements hold true for the next age group, 55-64 years (figure 9). In the age group 65-74 years senility begins to appear as a cause of death in

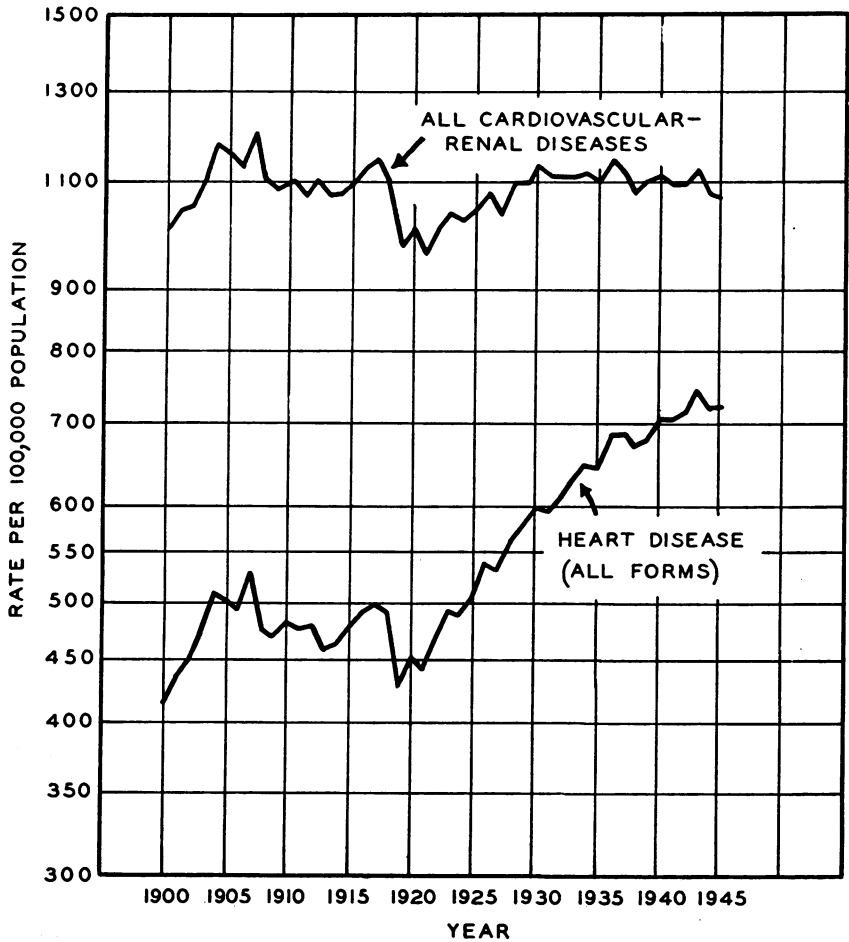


Figure 9. Cumulative mortality at ages 55-64 years (on logarithmic scale) for all forms of heart disease and cardiovascular-renal diseases: Death-registration States (1900-1945).

an appreciable proportion of the cases, but, with or without senility, there is no evidence of a definite upward trend in the death rate for the cardiovascular-renal group such as is seen in the heart disease rate (figure 10). Death rates at the older ages are subject to a greater error from misstatement of age on the death certificates and in the population enumeration than are the rates at the younger ages. However, these errors are such that the general trend of the mortality is relatively unaffected. At ages 75-84 years it is evident that the cardiovascular-renal causes showed an increasing death rate until about 1936, but in the last 9 years of the series there is a sign of a change in trend (figure 11). The data for persons 85 years of age and over are included for the sake of completeness, but little can be said about the statistics except for the fact that they appear to be con-

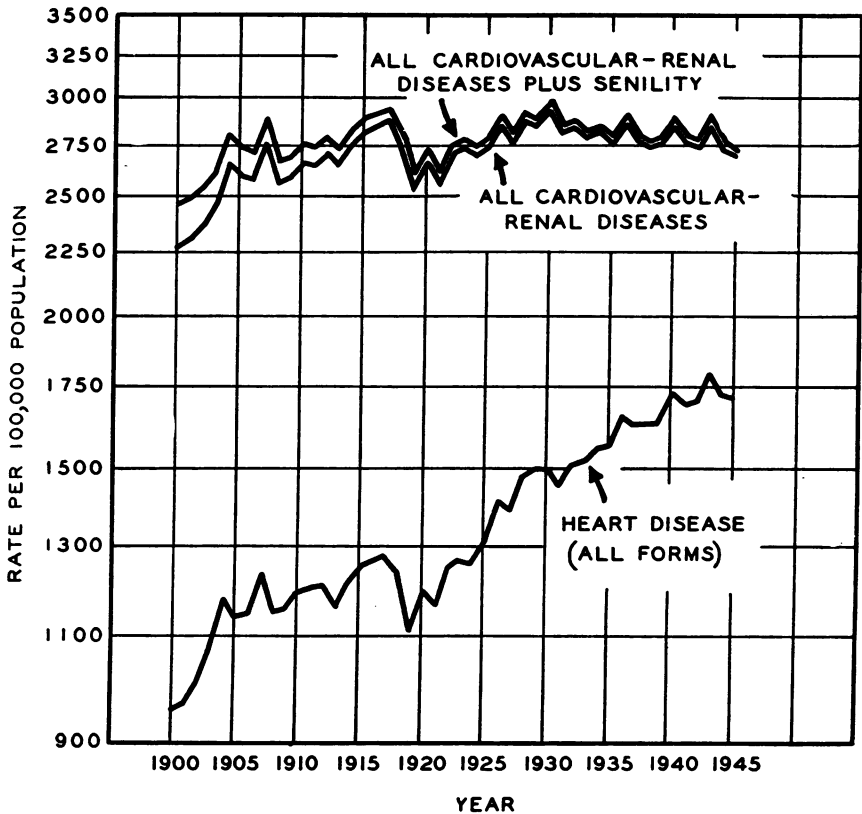


Figure 10. Cumulative mortality at ages 65-74 years (on logarithmic scale) for all forms of heart disease, cardiovascular-renal diseases and senility: Death-registration States (1900-1945).

sistent with those for the next younger age groups (see note and figure 12).

NOTE—Because of the fact that mortality from the cardiovascular-renal diseases rises very rapidly with age above 45 years (the rate in each group being more than twice that of the next younger group), it becomes important to know if the use of an age interval of 10 years, e. g., 65-74 years, obscures any detail owing to changes in the distribution of population within the age group. For example, it would be possible to have a declining mortality at 65-69 years and at 70-74 years and yet to have the death rates for the age group 65-74 years exhibit an upward trend simply because an increasing proportion of the persons living to 65 was surviving to the latter half of the 10-year span, in which the rate of dying is much higher. Consequently, death rates from cardiovascular-renal-senility causes were computed by 5-year age groups from 65 to 84, for the years 1930-45 and the slopes of the trends were compared with those for the two 10-year age groups. In the younger of the two no effect of the type described could be discerned, all slopes being about the same. In the 75-84 year group a very slight difference could be seen. The rate at 75-79 years was declining a little more rapidly than the rate for the two groups combined, while the rate at 80-84 years showed no appreciable change in the 15 years.

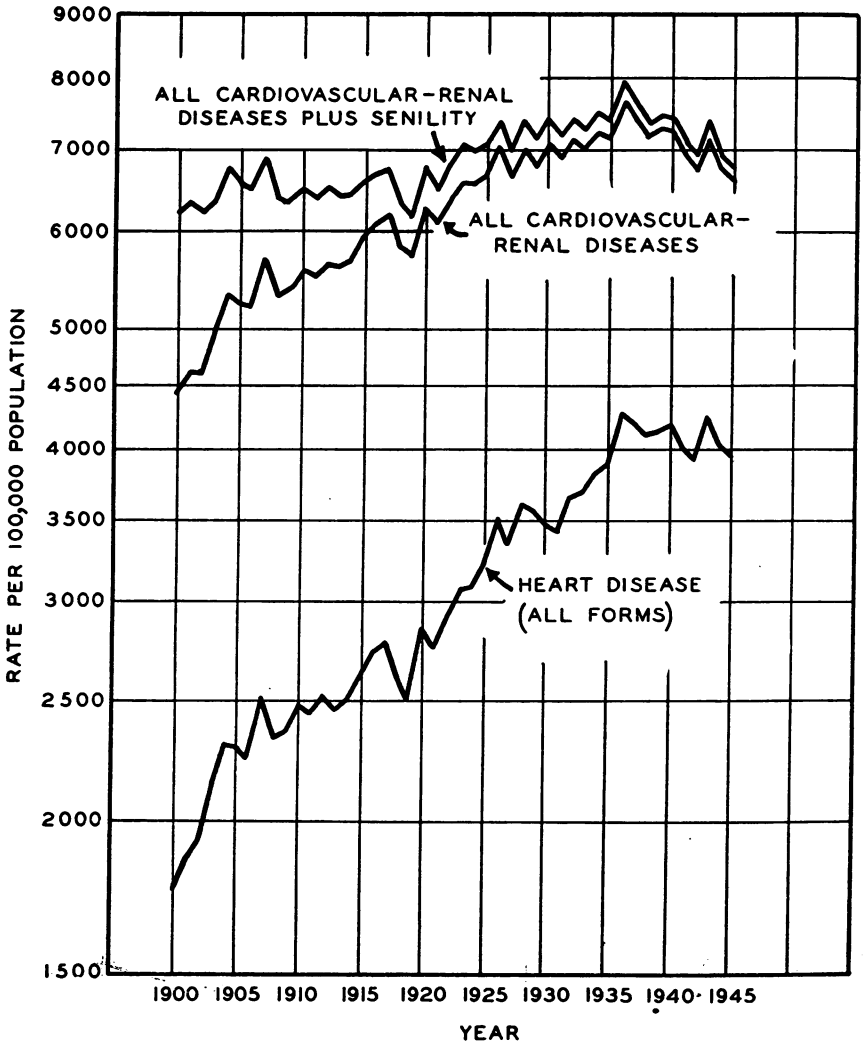


Figure 11. Cumulative mortality at ages 75-84 years (on logarithmic scale) for all forms of heart disease, cardiovascular-renal diseases and senility: Death-registration States (1900-1945).

It is possible that the addition of senility to the group of causes comprising the cardiovascular-renal disease complex may introduce some deaths that actually exhibit a different sort of pathology. However, figures 10, 11, and 12 demonstrate that no different conclusions as to trend from the year 1930 on would have been reached had senility been omitted from consideration.

A further point should be brought out in connection with the trends of mortality from heart disease alone in the six age groups over 35 years of age. One age group (35-44 years) has shown no particular

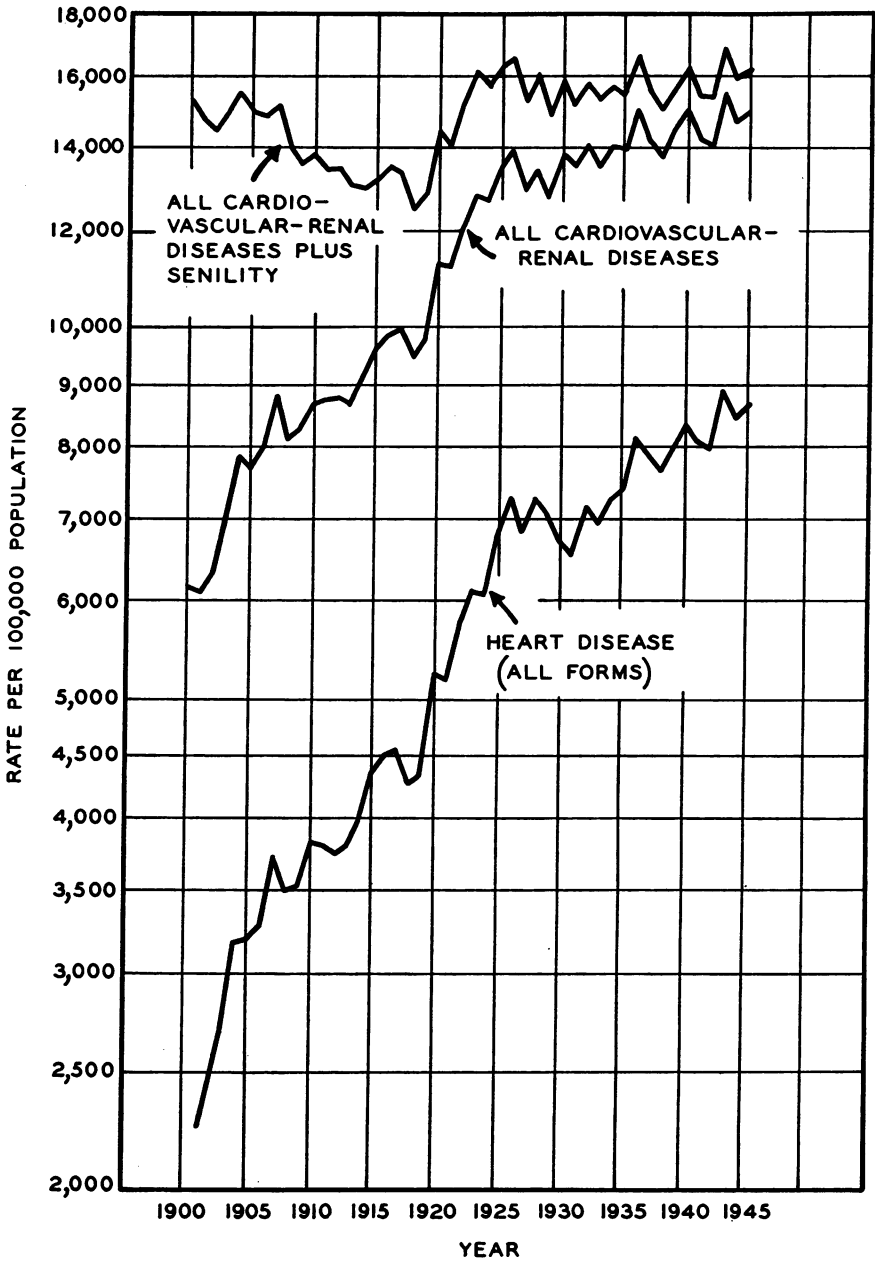


Figure 12. Cumulative mortality at ages 85 years and over (on logarithmic scale) for all forms of heart disease, cardiovascular-renal diseases and senility: Death registration States (1900-1945.)

trend over the entire 46-year period. Of the remaining five groups, four appear to provide some evidence of a slower rate of percentage increase in the 1936-45 decade than in the preceding 10-year period. The table below shows the annual average percentage increases in the heart disease death rate for these two decades in each of the six age groups:

<i>Age Groups</i>	<i>Percentage Increase</i>	
	<i>1926-1935</i>	<i>1936-1945</i>
35-44 years.....	0.2	-0.1
45-54 years.....	1.7	1.1
55-64 years.....	2.3	.9
65-74 years.....	1.1	.9
75-84 years.....	1.2	- .5
85 years and over.....	.3	1.1

### *Summary and discussion*

In the absence of statistics for the entire United States it is impossible to make a quantitative statement about the increase in mortality attributed to heart disease between 1900 and 1930 other than that the mortality probably rose more rapidly than the rates for the registration States would seem to indicate. Since 1930, when the registration area was virtually complete, the mortality assigned to heart disease has definitely increased for every age group over 45 years of age and has remained the same or declined in all the younger age groups. At ages over 45 years, however, there has also been a compensating decrease in the mortality from a certain group of causes of death known to be closely associated with heart disease, such as intracranial lesions of vascular origin, chronic nephritis, arteriosclerosis, and high blood pressure. This compensating effect is sufficient to remove all signs of an upward trend when the entire class of causes is considered together. This much is demonstrated by mortality statistics.

Changes in the terminology and detail in which the causes of death are reported on death certificates, owing to evolution in the practices of medical nomenclature and death certification, and changes in the rules for selection of the primary cause of death, have almost certainly resulted in corresponding alterations in the death rates for the diseases involved. Nevertheless, the fact that there is no consistent trend when mortality from the cardiovascular-renal-senility group is examined as a whole is not of itself a proof that changes in nomenclature and coding are solely responsible for the upward trend in heart diseases. It is still possible that a true increase may have taken place in the risk of dying from one or more of the various forms of heart disease and a true decline may have occurred in the rate of dying from intracranial lesions of vascular origin and chronic nephritis.

Opinions in the literature on this question tend to be very cautious. For example, after a study of the trend of death rates for heart disease and other cardiovascular-renal diseases in New York City, Bolduan, C. F., and Bolduan, N. W., stated (3) that "the registered rise in the death rate from heart disease is largely, if not wholly, fictitious." On the other hand, Dublin, L. I., and Armstrong, D. B., discussed the same subject and came to the conclusion (4) that "it is logical—to assume that at least a part of the recorded rise in heart disease is authentic."

It may be, however, that it is a matter of lesser importance to be able to establish definitely, amid the conflicting and sometimes unmeasurable limitations of heart disease statistics, whether the mortality from heart disease is, or is not, increasing. Perhaps the fact of significance is that which emerges when an effort is made to set up a comparable time series to avoid the extraneous influences. This fact is that for the group of diseases which reflect the damage to the heart, kidneys, and arterial system resulting from hypertension and arteriosclerosis the basic risk of dying for persons over 35 years of age is neither rising nor falling.

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## APPENDIX

Table 1. Crude death rates (per 100,000 population) for diseases of the heart and other causes of death;<sup>1</sup> Registration States, 1900-1945

Year	All causes (1-200)	Diseases of the heart (90-95) <sup>2</sup>	Diseases of the coronary arteries (94a)	Angina pectoris (94b)	Intracranial lesions of vasculor origin (85) <sup>3</sup>	Nephritis (all forms) (130-132) <sup>4</sup>	Major cardiovascular-renal diseases (83, 90-95, 130-132) <sup>5</sup>	Arteriosclerosis (97)	High blood pressure (102)	All cardiovascular-renal diseases (83, 90-95, 97, 102, 130-132) <sup>3, 5</sup>	Senility (102)	Undefined causes (199, 200)
1945 <sup>5</sup>	1,062.1	321.5	95.8	3.8	97.9	66.7	486.1	19.7	1.4	507.2	8.2	13.8
1944 <sup>5</sup>	1,064.7	315.4	89.6	4.3	93.7	69.2	478.3	19.3	1.3	498.9	8.2	14.0
1943 <sup>5</sup>	1,089.5	318.3	85.3	4.8	95.0	74.1	487.4	20.3	1.4	509.1	8.7	14.5
1942 <sup>5</sup>	1,035.5	295.2	80.2	4.8	90.2	72.4	457.8	18.2	1.3	477.3	7.9	14.4
1941 <sup>5</sup>	1,050.4	290.2	75.6	5.0	89.1	75.1	454.4	17.2	1.2	472.8	7.3	15.0
1940 <sup>5</sup>	1,074.1	291.9	71.3	5.6	90.8	81.4	464.1	17.2	1.0	482.3	7.7	16.0
1939 <sup>5</sup>	1,060.4	275.5	61.9	6.5	87.8	82.9	446.2	17.0	.9	464.1	7.3	15.1
1938 <sup>5</sup>	1,064.0	269.7	52.2	7.5	85.9	77.4	433.0	16.3	.8	450.1	7.1	15.1
1937 <sup>5</sup>	1,125.9	268.9	45.9	8.3	86.7	79.9	435.5	17.1	.8	453.4	7.7	16.0
1936 <sup>5</sup>	1,155.2	266.6	38.0	13.9	91.0	83.5	441.1	17.9	.7	459.7	8.9	16.5
1935 <sup>5</sup>	1,094.5	245.4	31.9	15.1	85.7	81.3	412.4	16.9	.6	429.9	7.9	16.2
1934 <sup>5</sup>	1,105.4	240.3	27.0	15.8	85.5	84.3	410.1	18.0	.6	428.7	8.7	16.6
1933 <sup>5</sup>	1,068.7	228.0	21.9	15.9	84.1	83.0	395.1	16.8	.5	412.4	9.0	17.5
1932 <sup>5</sup>	1,087.7	224.1	14.5	16.5	87.5	87.4	399.0	17.2	.4	416.6	8.5	17.3
1931 <sup>5</sup>	1,106.5	213.4	10.7	16.1	86.8	87.4	387.6	17.7	.5	405.8	8.7	18.4
1930 <sup>5</sup>	1,132.1	214.2	7.9	16.2	89.0	91.0	394.2	18.5	.4	413.1	9.9	20.5
1929 <sup>5</sup>	1,187.8	211.2	( <sup>6</sup> )	15.9	90.8	91.1	393.1	( <sup>6</sup> )	( <sup>6</sup> )	( <sup>6</sup> )	10.5	20.4
1928 <sup>5</sup>	1,198.6	207.7		15.7	92.0	94.9	394.6				11.5	20.1
1927 <sup>5</sup>	1,131.5	195.3		14.7	88.1	91.7	375.1				10.5	17.1
1926 <sup>5</sup>	1,211.0	198.6		14.4	91.3	97.3	387.2				11.3	17.5
1925 <sup>5</sup>	1,168.1	184.8		13.2	89.5	95.0	369.3				11.8	17.0
1924 <sup>5</sup>	1,159.0	175.7		11.0	97.2	87.8	360.7				12.5	16.9
1923 <sup>5</sup>	1,213.0	174.0		10.3	95.7	89.0	358.7				13.6	16.5
1922 <sup>5</sup>	1,169.3	165.0		9.9	92.1	87.7	344.8				13.1	17.2
1921 <sup>5</sup>	1,149.8	156.2		9.0	89.2	84.3	329.7				12.2	15.7
1920 <sup>5</sup>	1,298.9	159.6		8.6	93.0	88.8	341.4				14.2	17.5
1919 <sup>5</sup>	1,289.4	147.9		7.7	89.9	88.2	326.0				14.4	18.3
1918 <sup>5</sup>	1,810.0	171.6		7.5	94.0	97.4	363.0				15.1	18.9
1917 <sup>5</sup>	1,397.1	169.9		7.9	95.9	104.9	370.7				15.9	18.3
1916 <sup>5</sup>	1,381.1	167.2		7.7	94.7	103.1	365.0				17.4	15.5
1915 <sup>5</sup>	1,317.6	163.9		7.8	94.5	101.5	359.9				18.7	10.3
1914 <sup>5</sup>	1,330.2	158.2		7.3	93.6	99.2	351.0				20.1	11.3
1913 <sup>5</sup>	1,380.6	154.6		7.4	91.1	99.7	345.4				22.3	13.6
1912 <sup>5</sup>	1,359.7	158.7		7.5	91.9	99.7	350.3				24.0	10.8
1911 <sup>5</sup>	1,390.5	156.4		7.3	91.8	94.2	342.4				23.9	11.2
1910 <sup>5</sup>	1,468.0	158.9		7.4	95.8	94.8	349.5				25.5	22.0
1909 <sup>5</sup>	1,424.7	153.0		7.1	95.5	92.5	341.0				26.3	24.1
1908 <sup>5</sup>	1,468.2	152.0		6.7	95.6	91.0	338.6				29.2	28.8
1907 <sup>5</sup>	1,592.5	166.6		7.2	104.5	100.9	372.0				31.1	32.9
1906 <sup>5</sup>	1,571.8	154.2		6.9	98.6	95.9	348.7				33.4	37.9
1905 <sup>5</sup>	1,588.9	161.9		7.4	105.9	101.2	369.0				37.9	37.6
1904 <sup>5</sup>	1,640.0	163.7		7.1	108.6	102.4	374.7				40.8	39.0
1903 <sup>5</sup>	1,562.8	151.8		7.6	105.2	96.3	353.3				41.1	41.2
1902 <sup>5</sup>	1,548.1	145.4		7.2	103.9	90.6	339.9				45.2	46.3
1901 <sup>5</sup>	1,641.5	140.0		6.9	106.9	89.9	336.8				48.3	52.0
1900 <sup>5</sup>	1,719.1	137.4		6.9	106.9	88.6	332.9				50.2	67.4

<sup>1</sup> Crude death rates include deaths at unknown ages.<sup>2</sup> Excludes diseases of coronary arteries for the years 1900-29, inclusive, and excludes for the years 1939-45 certain terms relating to combined cardiorenal conditions which were transferred to nephritis.<sup>3</sup> Includes all embolism and thrombosis, except puerperal, for the years 1900-20, inclusive.<sup>4</sup> Includes, for the years 1939-45 inclusive, certain terms relating to combined cardiorenal conditions which were transferred from diseases of the heart.<sup>5</sup> Excludes the armed forces overseas.<sup>6</sup> Not available on a comparable basis before 1930.



Table 2. Age-adjusted death rates (per 100,000 population) adjusted by the direct method for diseases of the heart and other causes of death<sup>1</sup>; Registration States, 1900-1945

Year	All causes (1-200)	Diseases of the heart (90-95) <sup>2</sup>	Diseases of the coronary arteries (94a)	Angina pectoris (94b)	Intracranial lesions of vasculogenesis (93) <sup>3</sup>	Nephritis (all forms) (130-132) <sup>4</sup>	Major cardiovascular-renal diseases (83, 90-95, 130-132) <sup>5</sup>	Arteriosclerosis (97)	High blood pressure (102)	All cardiovascular-renal diseases (83, 90-95, 97, 102, 130-132) <sup>6</sup>	Senility (162)	Ill-defined causes (196, 200)
1945 <sup>1</sup>	961.8	288.3	86.3	3.4	87.3	60.1	435.7	17.2	1.3	454.2	7.1	11.3
1944 <sup>1</sup>	983.6	290.8	82.9	4.0	86.1	64.0	440.9	17.4	1.2	459.6	7.4	11.6
1943 <sup>1</sup>	1,024.0	301.9	81.2	4.6	89.9	70.3	462.1	18.9	1.3	482.4	8.0	12.1
1942 <sup>1</sup>	997.2	285.3	77.7	4.6	87.0	70.0	442.3	17.4	1.2	460.9	7.5	12.6
1941 <sup>1</sup>	1,031.5	285.4	74.4	4.9	87.6	73.9	446.9	16.8	1.2	464.9	7.1	13.6
1940 <sup>1</sup>	1,069.8	290.6	71.0	5.6	90.3	80.9	461.8	17.1	1.0	480.0	7.6	15.8
1939 <sup>1</sup>	1,074.8	381.0	63.0	6.6	89.6	84.5	455.1	17.4	1.0	473.5	7.4	15.1
1938 <sup>1</sup>	1,092.4	280.0	54.1	7.7	89.4	80.3	449.7	17.1	.8	467.6	7.4	15.3
1937 <sup>1</sup>	1,171.9	284.2	48.4	8.7	91.9	84.3	460.4	18.3	.8	479.5	8.2	16.4
1936 <sup>1</sup>	1,217.5	286.9	40.7	14.9	96.3	89.7	474.9	19.6	.8	495.3	9.7	17.0
1935 <sup>1</sup>	1,165.8	269.0	34.8	16.5	94.4	89.0	452.4	19.0	.7	472.0	8.8	16.7
1934 <sup>1</sup>	1,190.9	268.0	30.0	17.5	96.1	94.0	458.1	20.6	.6	479.3	10.0	17.2
1933 <sup>1</sup>	1,164.1	258.9	24.7	18.0	96.2	84.1	449.2	19.6	.6	469.4	10.6	18.2
1932 <sup>1</sup>	1,187.2	256.5	16.5	18.9	101.0	99.8	457.3	20.3	.5	478.2	10.1	17.8
1931 <sup>1</sup>	1,210.9	247.9	12.4	18.7	102.0	101.3	451.2	21.4	.5	473.1	10.6	18.7
1930 <sup>1</sup>	1,246.1	252.7	9.3	19.1	106.5	107.1	466.3	22.8	.5	489.7	12.3	20.7
1929 <sup>1</sup>	1,320.0	253.6	(e)	19.1	110.8	108.9	473.3	(e)	(e)	(e)	13.5	20.9
1928 <sup>1</sup>	1,337.5	253.2	.....	19.1	114.2	115.1	482.4	.....	.....	.....	15.2	20.5
1927 <sup>1</sup>	1,256.9	238.3	.....	17.9	109.8	111.5	459.6	.....	.....	.....	14.1	16.9
1926 <sup>1</sup>	1,346.5	244.9	.....	17.8	115.0	119.5	479.3	.....	.....	.....	15.5	17.4
1925 <sup>1</sup>	1,299.9	229.6	.....	16.5	114.2	117.9	461.7	.....	.....	.....	16.5	16.8
1924 <sup>1</sup>	1,290.7	219.9	.....	13.9	125.2	109.6	454.6	.....	.....	.....	17.5	16.6
1923 <sup>1</sup>	1,352.1	219.4	.....	13.1	124.3	111.9	455.7	.....	.....	.....	19.2	16.1
1922 <sup>1</sup>	1,306.0	210.8	.....	12.8	121.4	111.6	443.8	.....	.....	.....	18.5	16.5
1921 <sup>1</sup>	1,266.4	198.5	.....	11.6	117.5	106.8	422.8	.....	.....	.....	17.1	14.9
1920 <sup>1</sup>	1,423.6	203.6	.....	11.2	122.6	112.7	439.0	.....	.....	.....	19.8	16.8
1919 <sup>1</sup>	1,404.1	186.9	.....	9.9	117.4	110.8	415.1	.....	.....	.....	19.5	17.4
1918 <sup>1</sup>	1,906.6	212.8	.....	9.6	121.2	120.5	454.4	.....	.....	.....	20.3	17.9
1917 <sup>1</sup>	1,527.0	214.9	.....	10.3	125.7	131.7	472.3	.....	.....	.....	21.6	17.3
1916 <sup>1</sup>	1,511.5	212.3	.....	10.0	124.6	129.7	466.7	.....	.....	.....	23.9	14.7
1915 <sup>1</sup>	1,443.4	206.3	.....	10.1	123.3	126.4	455.9	.....	.....	.....	25.4	10.0
1914 <sup>1</sup>	1,447.3	199.8	.....	9.5	122.7	123.8	446.4	.....	.....	.....	27.5	10.9
1913 <sup>1</sup>	1,495.4	196.1	.....	9.7	123.2	124.7	444.0	.....	.....	.....	30.8	13.0
1912 <sup>1</sup>	1,483.2	201.8	.....	9.8	121.3	124.8	447.9	.....	.....	.....	33.2	10.8
1911 <sup>1</sup>	1,513.5	199.6	.....	9.5	121.7	118.2	439.5	.....	.....	.....	33.3	11.2
1910 <sup>1</sup>	1,578.8	210.7	.....	9.7	126.4	118.1	446.2	.....	.....	.....	35.4	20.1
1909 <sup>1</sup>	1,530.1	193.8	.....	9.2	125.7	114.6	434.0	.....	.....	.....	36.4	22.3
1908 <sup>1</sup>	1,574.9	194.4	.....	8.9	127.2	113.3	434.9	.....	.....	.....	41.4	26.6
1907 <sup>1</sup>	1,710.0	212.5	.....	9.5	138.7	125.0	476.2	.....	.....	.....	44.3	30.4
1906 <sup>1</sup>	1,667.0	196.2	.....	9.1	130.7	118.7	445.7	.....	.....	.....	47.8	35.4
1905 <sup>1</sup>	1,673.5	198.7	.....	9.3	134.4	121.5	454.6	.....	.....	.....	50.2	35.1
1904 <sup>1</sup>	1,729.0	201.4	.....	8.9	137.8	122.8	462.0	.....	.....	.....	54.1	36.9
1903 <sup>1</sup>	1,645.6	186.7	.....	9.6	133.2	115.0	434.8	.....	.....	.....	54.5	39.6
1902 <sup>1</sup>	1,616.4	177.7	.....	9.0	131.1	107.9	416.8	.....	.....	.....	60.0	44.0
1901 <sup>1</sup>	1,721.2	171.0	.....	8.7	134.5	106.9	412.4	.....	.....	.....	63.9	50.0
1900 <sup>1</sup>	1,778.5	167.3	.....	8.6	134.4	105.2	406.9	.....	.....	.....	66.2	66.1

<sup>1</sup> Age-adjusted death rates exclude deaths at unknown ages.

<sup>2</sup> Excludes diseases of coronary arteries for the years 1900-29, inclusive, and excludes for the years 1939-45, certain terms relating to combined cardiorenal conditions which were transferred to nephritis.

<sup>3</sup> Includes all embolism and thrombosis, except puerperal, for the years 1900-20 inclusive.

<sup>4</sup> Includes, for the years 1939-45, inclusive, certain terms relating to combined cardiorenal conditions which were transferred from diseases of the heart.

<sup>5</sup> Excludes the armed forces overseas.

<sup>6</sup> Not available on a comparable basis before 1930.

**Table 3. Crude death rates (per 100,000 population) for all causes, diseases of the heart, and certain other causes of death, and age-adjusted death rates by the direct method (per 100,000 population) for all causes and diseases of the heart; Registration States of 1900 (1900-1940)**

Year	Crude rates <sup>1</sup>									Age-adjusted (direct method) <sup>1</sup>	
	All causes (1-200)	Diseases of the heart (90-96) <sup>2</sup>	Intracranial lesions of vascular origin (83) <sup>3</sup>	Nephritis (all forms) (130-132) <sup>4</sup>	Major cardiovascular-renal diseases (83, 90-96, 130-132) <sup>5</sup>	Arteriosclerosis (97)	High blood pressure (102)	All cardiovascular-renal diseases (83, 90-96, 97, 102, 130-132) <sup>5</sup>	Senility (162)	All causes (1-200)	Diseases of the heart (90-96) <sup>2</sup>
1940	1,114.1	362.1	90.7	74.8	527.6	21.4	0.8	549.8	2.9	1,062.4	338.5
1939	1,108.1	347.4	88.2	78.7	514.3	21.1	.7	536.1	3.0	1,075.9	331.9
1938	1,096.8	335.5	85.0	74.3	495.7	20.5	.4	516.6	2.9	1,084.9	326.8
1937	1,154.7	333.6	88.2	76.4	498.2	22.3	.5	521.0	3.1	1,161.2	351.3
1936	1,166.9	329.4	91.9	80.0	501.3	22.4	.3	524.0	3.7	1,189.2	353.8
1935	1,126.9	307.1	87.9	80.7	475.7	22.1	.3	498.1	3.4	1,163.3	316.9
1934	1,140.0	305.3	88.9	85.4	479.6	23.7	.3	503.6	3.8	1,195.7	319.8
1933	1,132.1	294.5	89.4	86.5	470.4	23.0	.2	493.6	4.2	1,197.6	315.2
1932	1,133.9	281.2	90.0	90.0	461.2	22.9	.2	484.3	4.3	1,210.2	306.6
1931	1,141.0	266.2	89.4	88.7	444.3	24.1	.2	468.6	4.4	1,221.9	294.6
1930	1,154.8	265.1	90.4	91.2	446.7	25.5	.1	472.3	5.1	1,246.2	297.8
1929	1,240.9	267.8	95.6	91.2	454.6	( <sup>b</sup> )	( <sup>b</sup> )	( <sup>c</sup> )	5.8	1,348.2	305.7
1928	1,245.6	262.6	98.5	95.9	457.0				6.3	1,359.9	303.4
1927	1,192.6	242.6	96.1	96.2	434.9				6.3	1,301.8	283.0
1926	1,288.6	251.6	100.5	103.7	455.8				7.0	1,407.8	297.0
1925	1,237.0	233.7	98.9	101.2	433.8				7.4	1,353.7	277.6
1924	1,223.7	219.8	108.6	92.4	420.8				7.8	1,336.8	262.7
1923	1,287.1	222.4	108.3	95.8	426.5				9.0	1,408.0	267.5
1922	1,258.7	210.7	106.0	95.3	412.0				9.1	1,371.9	254.3
1921	1,215.3	194.0	102.4	90.1	386.5				8.4	1,312.0	234.7
1920	1,385.7	199.0	107.5	98.1	404.6				10.1	1,496.3	240.6
1919	1,355.5	184.5	105.1	96.8	386.4				10.4	1,446.9	223.3
1918	1,916.4	213.5	110.6	108.8	432.9				11.0	1,984.8	258.7
1917	1,495.4	209.6	110.4	118.7	438.7				12.6	1,607.4	254.3
1916	1,496.7	205.3	107.2	117.6	430.1				14.9	1,604.1	249.4
1915	1,427.2	193.6	105.7	112.9	412.2				16.7	1,537.6	235.5
1914	1,438.8	188.9	107.5	114.2	410.6				19.0	1,541.3	230.1
1913	1,469.9	181.2	102.7	113.0	396.9				22.8	1,568.2	221.0
1912	1,461.4	181.0	103.9	114.1	399.0				25.8	1,561.5	221.0
1911	1,502.5	182.5	104.7	110.0	397.2				24.8	1,608.1	223.1
1910	1,562.4	180.9	105.4	107.3	393.6				26.2	1,655.0	221.4
1909	1,493.8	169.3	103.6	103.1	376.0				27.3	1,582.5	207.4
1908	1,513.5	167.5	103.5	99.1	370.1				29.9	1,599.0	205.4
1907	1,611.2	177.8	109.8	107.1	394.7				33.5	1,710.4	218.1
1906	1,589.8	164.4	104.0	102.8	371.2				37.9	1,667.3	201.8
1905	1,588.9	161.9	105.9	101.2	369.0				37.9	1,674.5	198.7
1904	1,640.0	163.7	108.6	102.4	374.7				40.8	1,729.4	201.4
1903	1,562.8	151.8	105.2	96.3	353.3				41.1	1,646.0	186.7
1902	1,548.1	145.4	103.9	90.6	339.9				45.2	1,616.4	177.7
1901	1,641.5	140.0	106.9	89.9	336.8				48.3	1,718.9	161.0
1900	1,719.1	137.4	106.9	88.6	332.9				50.2	1,779.7	167.3

<sup>1</sup> Crude rates include deaths at unknown ages; age-adjusted rates (direct method) exclude such deaths.

<sup>2</sup> Excludes diseases of coronary arteries for the years 1900-29 inclusive, and excludes for the years 1939 and 1940 certain terms relating to combined cardiorenal conditions which were transferred to nephritis.

<sup>3</sup> Includes all embolism and thrombosis, except puerperal, for the years 1900-20 inclusive.

<sup>4</sup> Includes, for the years 1939 and 1940, certain terms relating to combined cardiorenal conditions which were transferred from diseases of the heart.

<sup>5</sup> Not available on a comparable basis before 1930.

Table 4. *Age-adjusted death rates (per 100,000 population) for diseases of the heart and certain other causes of death, in the registration States of 1900; also crude and age-adjusted death rates for diseases of the heart in the registration States of 1910 and 1920*

[All age-adjusted rates in this table were adjusted by the indirect method]

Year	Registration States of 1900								Diseases of the heart (90-95) <sup>2</sup>			
	Age-adjusted rates <sup>1</sup>								States of 1910		States of 1920	
	Diseases of the heart (90-95) <sup>3</sup>	Intracranial lesions of vascular origin (83) <sup>3</sup>	Nephritis (all forms) (130-132) <sup>4</sup>	Major cardiovascular-renal diseases (83, 90-95, 130-132) <sup>3</sup>	Arteriosclerosis (97)	High blood pressure (102)	All cardiovascular-renal diseases (83, 90-95, 97, 102, 130-132) <sup>3</sup>	Senility (162)	Crude rates <sup>1</sup>	Age-adjusted <sup>1</sup>	Crude rates <sup>1</sup>	Age-adjusted <sup>1</sup>
1940.....	340.0	85.2	70.5	495.7	20.2	0.8	516.7	2.8	343.9	320.5	315.1	306.0
1939.....	333.2	84.8	75.7	493.7	21.7	0.7	516.1	2.9	326.7	310.7	297.6	295.2
1938.....	328.1	84.1	72.8	485.0	20.4	0.4	505.8	2.9	316.8	307.0	290.8	294.6
1937.....	332.6	88.1	76.3	497.0	22.8	0.5	520.3	3.2	317.5	313.4	290.7	300.5
1936.....	334.7	93.7	81.4	500.8	23.5	0.3	533.6	3.0	311.2	313.4	287.7	303.5
1935.....	318.2	91.5	83.7	493.4	23.7	0.3	517.4	3.7	290.8	298.4	265.6	285.5
1934.....	322.4	94.4	90.3	507.1	26.1	0.3	533.5	4.3	284.5	207.6	260.4	285.4
1933.....	318.9	96.8	93.1	506.8	25.9	0.2	532.9	4.8	272.9	290.9	248.0	276.8
1932.....	308.2	99.4	98.6	506.2	26.4	0.2	532.8	5.1	262.3	285.1	238.8	271.0
1931.....	296.8	100.5	98.9	496.2	28.3	0.2	524.7	5.3	248.5	274.8	227.3	262.3
1930.....	300.1	103.2	103.1	506.4	30.5	0.1	537.0	6.2	247.1	278.0	227.1	265.2
1929.....	308.0	110.9	104.8	528.7	(5)	(5)	(5)	7.3	244.5	279.7	224.2	266.6
1928.....	305.7	115.7	111.6	533.0	.....	.....	.....	8.2	239.7	278.5	220.5	265.7
1927.....	285.8	114.3	113.1	513.2	.....	.....	.....	8.3	222.3	261.9	203.2	248.1
1926.....	299.2	120.6	123.2	543.0	.....	.....	.....	9.4	225.0	268.2	204.7	252.8
1925.....	280.9	120.1	121.4	522.4	.....	.....	.....	10.0	209.3	252.8	190.2	237.6
1924.....	266.2	122.9	111.7	510.8	.....	.....	.....	10.7	197.3	240.7	179.8	226.7
1923.....	270.7	133.2	116.3	520.2	.....	.....	.....	12.3	198.4	244.0	177.8	226.2
1922.....	257.7	131.0	116.3	505.0	.....	.....	.....	12.3	188.1	233.1	168.0	215.2
1921.....	238.4	127.2	110.4	476.0	.....	.....	.....	11.3	174.1	217.3	156.2	201.3
1920.....	244.4	133.5	120.1	498.0	.....	.....	.....	13.3	177.6	222.4	159.6	206.7
1919.....	224.2	129.0	117.0	470.2	.....	.....	.....	13.3	165.6	205.5	.....	.....
1918.....	257.3	134.6	130.6	522.5	.....	.....	.....	13.9	190.2	234.7	.....	.....
1917.....	258.2	137.3	145.4	540.9	.....	.....	.....	16.3	185.8	234.9	.....	.....
1916.....	254.4	134.2	144.9	533.5	.....	.....	.....	19.4	181.5	231.2	.....	.....
1915.....	241.0	133.1	139.8	513.9	.....	.....	.....	21.7	172.5	221.3	.....	.....
1914.....	236.1	135.8	141.8	513.7	.....	.....	.....	24.8	167.4	216.1	.....	.....
1913.....	227.4	130.1	140.9	496.4	.....	.....	.....	29.8	162.1	210.4	.....	.....
1912.....	227.9	132.2	142.6	502.7	.....	.....	.....	33.8	164.2	214.4	.....	.....
1911.....	230.3	133.6	137.8	501.7	.....	.....	.....	32.5	162.1	212.8	.....	.....
1910.....	228.8	134.6	134.0	496.2	.....	.....	.....	34.4	158.9	209.7	.....	.....
1909.....	214.8	132.8	129.8	477.4	.....	.....	.....	36.0	.....	.....	.....	.....
1908.....	213.2	133.2	125.3	471.7	.....	.....	.....	39.7	.....	.....	.....	.....
1907.....	227.0	141.6	135.7	504.3	.....	.....	.....	44.8	.....	.....	.....	.....
1906.....	210.4	134.4	130.7	475.5	.....	.....	.....	50.9	.....	.....	.....	.....
1905.....	207.4	137.0	128.7	473.1	.....	.....	.....	51.0	.....	.....	.....	.....
1904.....	210.2	140.9	130.5	481.6	.....	.....	.....	55.1	.....	.....	.....	.....
1903.....	195.2	136.7	122.9	454.8	.....	.....	.....	55.6	.....	.....	.....	.....
1902.....	187.0	135.0	115.7	437.7	.....	.....	.....	61.1	.....	.....	.....	.....
1901.....	180.2	138.9	114.8	433.9	.....	.....	.....	65.2	.....	.....	.....	.....
1900.....	176.8	138.9	113.1	428.8	.....	.....	.....	67.6	.....	.....	.....	.....

<sup>1</sup> Both crude and age-adjusted rates (indirect method) include deaths at unknown ages.

<sup>2</sup> Excludes diseases of coronary arteries for the years 1900-29, inclusive, and excludes for the years 1939 and 1940 certain terms relating to combined cardiorenal conditions which were transferred to nephritis.

<sup>3</sup> Includes all embolism and thrombosis, except puerperal, for the years 1900-20, inclusive.

<sup>4</sup> Includes, for the years 1939 and 1940, certain terms relating to combined cardiorenal conditions which were transferred from diseases of the heart.

<sup>5</sup> Not available on a comparable basis before 1930.

# 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

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REPORTS FROM STATES FOR WEEK ENDED SEPTEMBER 4, 1948

### Summary

The incidence of poliomyelitis increased from 1,407 last week to 1,512 for the current week, as compared with 1,780 for the corresponding week in 1946 and a 5-year (1943-47) median of 956. Of 32 States reporting currently 10 or more cases, 18 showed a combined increase of 216 (828 to 1,044), 13 reported a decline from 467 to 351, and Virginia reported 31 cases for each week. The 19 States reporting more than 16 cases and showing changes are as follows (last week's figures in parentheses): *Increases*—New York 101 (87), New Jersey 56 (50), Pennsylvania 51 (47), Indiana 39 (19), Illinois 87 (62), Wisconsin 39 (31), Minnesota 90 (89), North Dakota 38 (5), South Dakota 21 (10), Kansas 28 (18), North Carolina 138 (133), Tennessee 34 (18), California 264 (226); *decreases*—Ohio 65 (76), Michigan 48 (53), Iowa 53 (57), Nebraska 27 (54), South Carolina 23 (27), Texas 52 (71). Since March 20, approximate average date of seasonal low incidence, 12,311 cases have been reported, as compared with 11,967 for the same period in 1946 and a 5-year median of 5,759. The 16 States reporting more than 190 cases since March 20 are as follows: California 2,109, North Carolina 1,875, Texas 1,287, New York 565, Ohio 530, Minnesota 449, Illinois 438, Iowa 368, New Jersey 314, Pennsylvania 300, Nebraska 300, Virginia 290, Michigan 263, South Carolina 249, Oklahoma 228, and Tennessee 209.

Of 27 cases of Rocky Mountain spotted fever reported (last week 24, 5-year median 16), 16 occurred in 7 South Atlantic and South Central States, 8 in 4 North Central States, and 1 each in New York, New Mexico, and Nevada. One case of anthrax was reported in Pennsylvania.

Deaths recorded during the week in 93 large cities in the United States totaled 10,547, as compared with 8,702 last week, 7,629 and 7,914, respectively, for the corresponding weeks of 1947 and 1946, and a 3-year (1945-47) median of 7,914. For the year to date the total is 336,313, as compared with 334,532 for the same period last year. Infant deaths totaled 736, as compared with 699 last week and a 3-year median of 659. The cumulative figure is 24,166, as compared with 26,861, for the same period last year.

Telegraphic cases reported from State health officers for week ended September 4, 1948

(Leaders indicate that no cases were reported)

Division and State	Diphtheria	Erysiphe- litis, infectious	Influenza	Measles	Menin- gitis, menin- gococcal	Pneu- monia	Polio- myelitis	Rocky Mt. spotted fever	Scarlet fever	Small- pox	Tulare- mia	Typhoid and para- typhoid fever 4	Whoop- ing cough	Rabies in ani- mals
<b>NEW ENGLAND</b>														
Maine.....				18			4		2			1	10	0
New Hampshire.....				2			3						5	0
Vermont.....				7			2		1				60	0
Massachusetts.....	4			78		22	12		18			1	6	0
Rhode Island.....				8		6			6				10	0
Connecticut.....				12		24	9		1			1		0
<b>MIDDLE ATLANTIC</b>														
New York.....	2		b2	92	5	131	101	1	23			8	136	12
New Jersey.....	1			45	2	37	56		4				60	3
Pennsylvania.....	4		(c)	30	1		51		17			4	77	2
<b>EAST NORTH CENTRAL</b>														
Ohio.....	3		1	13	1	22	65		34			5	39	9
Indiana.....	4		8	113		10	69	2	8			2	13	10
Illinois.....	1		3	9	2	65	87	2	16			2	42	4
Michigan.....	1			48	1	14	48		13			1	46	5
Wisconsin.....			1	87		3	39		4				21	
<b>WEST NORTH CENTRAL</b>														
Minnesota.....	2			3			90		4			1	4	0
Iowa.....	2			2			53					1	9	0
Missouri.....	2			3	2	13	12	2	5		4	5	4	0
North Dakota.....			11	9			12					1	6	0
South Dakota.....				1		7	21	2					2	0
Nebraska.....				2		1	27		5				1	0
Kansas.....	1			5		11	28		2				14	0
<b>SOUTH ATLANTIC</b>														
Delaware.....				1			7		2					0
Maryland.....	5		1	19		9	3	1	7			1	13	
District of Columbia.....				1		18	11		6				2	
Virginia.....	3		134	9		17	131		4			5	2	2
West Virginia.....			6	2		12	7		4			1	1	
North Carolina.....	10			3	1	138	12	1	5			1	24	
South Carolina.....	20		95	3		138	138	2	8				8	
Georgia.....	13		3	8	3	123	13	2	9			5	13	1
Florida.....	8		4	4	1	10	12		3		1	3	8	

See footnotes at end of table.

State Reports—Continued

(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	Tulariaemia	Typhoid and paratyphoid fever z	Whooping cough	Rabies in animals
<b>EAST SOUTH CENTRAL</b>														
Kentucky	3			3	4	10	11	3	12			4	5	
Tennessee	5	1	7	2	5	24	34	5	12		2	5	24	0
Alabama	4		2	12	1	10	10		10			2	11	5
Mississippi	8			1	1	20	8		1			3		
<b>WEST SOUTH CENTRAL</b>														
Arkansas	3		15	5	2	10	9				3	10	13	1
Louisiana	2	2	1	1		27	10					2		0
Oklahoma					2	4	14	2	2			2	4	4
Texas	17		328	116	5	51	52		6			10	70	21
<b>MOUNTAIN</b>														
Montana	1	2	1	3			6		6			1	3	0
Idaho			21	3		2	3		6		2	1	8	0
Wyoming							2							
Colorado	1		2	12		6	13		2			2	7	0
New Mexico	1			4		4	5	1	2			2	9	0
Arizona	4		14	4		11	11		1				12	1
Utah	2			20			3	1			1		12	0
Nevada							1							
<b>PACIFIC</b>														
Washington			4	15		7	9		4				2	0
Oregon			5	45		13	8		5				12	0
California	7	5	5	72	3		284		20			2	37	4
Total	144	14	687	839	43	628	1,597	27	296	2	15	100	891	
Median, 1943-47	198	29	565	680	61		956	16	654		11	149	2,124	
Year to date, 35 weeks	5,598	363	142,483	1,651,414	2,387		112,681	461	56,616	50	701	2,369	59,250	
Median, 1943-47	7,698	425	193,041	530,146	6,329		6,156	389	87,912	279	615	3,111	88,869	
Seasonal low week ends	July 10		(30th)	(36th)	(37th)		(11th)		(24d)	(36th)		(11th)	(36th)	
Since seasonal low week	July 10		July 31	Sept. 4	Sept. 4		Mar. 20		Aug. 14	Sept. 4		Mar. 20	Oct. 2	
Median, 1943-47	1,466		3,668	1,656,282	3,189		12,315		1,000	356		1,896	90,516	
			2,740	577,159	8,781		5,759		1,961			2,487	110,916	

a Period ended earlier than Saturday.  
 b New York City and Philadelphia only, respectively.  
 c Including cases reported as streptococcal infections and septic sore throat.  
 d Including paratyphoid fever and salmonella infections; currently reported separately, as follows: Connecticut 1; New York (salmonella infection) 4; Ohio 1; North Dakota 1; Virginia 2; Florida 2; Tennessee 1; California 3.  
 Alaska: Mumps 1; Chickenpox 6; Scarlet fever 2; Measles 1; Cerebrospinal meningitis 1. Territory of Hawaii: Measles 7; Whooping cough 4.  
 Antwar: Pennsylvania 1.  
 1 Correction: Poliomyelitis, Virginia, 3 cases deducted from cumulative totals; delayed reports, Indiana, week ended July 17, measles 37 cases; South Carolina, week ended Aug. 21, poliomyelitis 1 case, pneumonia 14 cases.

# FOREIGN REPORTS

## CANADA

*Provinces—Communicable diseases—Week ended August 14, 1948.—*

During the week ended August 14, 1948, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox.....		12		32	56	25	6	29	25	185
Diphtheria.....				3	5	3	1		1	13
Dysentery, bacillary.....				1						1
Encephalitis, infectious.....					1		1			2
German measles.....		1			6		1	1	1	10
Influenza.....		17			18				3	38
Measles.....		2	1	29	45	21	13	21	15	147
Meningitis, meningococcus.....				1			1			2
Mumps.....		1		9	25	20	7	11	7	80
Poliomyelitis.....				3	16	4	4	23	2	52
Scarlet fever.....		4	2	2	20	3				31
Tuberculosis (all forms).....		6	13	88	23	73	15		47	265
Typhoid and paratyphoid fever.....			1	4		2			4	11
Undulant fever.....					2					4
Veneral diseases:										
Gonorrhoea.....		12	13	112	101	39	16	49	83	425
Syphilis.....		11	3	66	38	7	6	5	13	149
Whooping cough.....		50		111	5	3		2		171

## 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 June 1948	July 1948	August 1948—week ending—			
			7	14	21	28
AFRICA						
Egypt.....	1					
Cairo.....	1					
ASIA						
Burma.....	37	2	3			
Akyab.....	5					
Bassein.....	1					
Rangoon.....	2					
China:						
Hupeh Province.....	1	1				
Wuchang.....	1	1				
Kiangsi Province.....	19					
Kiangsu Province.....	1					

## CHOLERA—Continued

Place	January-June 1948	July 1948	August 1948—week ending—			
			7	14	21	28
ASIA—continued						
India.....	81,008	23,513	3,834	3,546		
Ahmadabad.....	2	52	3	8		
Alleppey.....	1					
Bombay <sup>2</sup> .....	5	21	1	1		
Calcutta <sup>2</sup> .....	6,224	589	73	71	64	
Cawnpore.....	76	27	6	12	9	
Cocanada.....	2					
Colachel.....	12					
Cuddalore.....	12					
Jodhpur <sup>2</sup> .....	1	2				
Kilakarai.....	21					
Lucknow.....	29	11	1	1		
Madras.....	59	63	17	45	42	
Nagpur.....	6	42	6			
Negapatam.....	16					
New Delhi.....	25	1				
Raj Samand.....	6					
Tuticorin.....	16					
Vizagapatam.....	1					
India (French):						
Chandernagor.....	21					
Karikal.....	300					
Pondicherry.....	59	106	40			
India (Portuguese).....	1					
Indochina (French):						
Cambodia.....	1,231	106	1	5		
Cochinchina.....	577	10				
Bien Hoa.....	1					
Chaudoc.....	2					
Cholon.....	29					
Giadinh.....	23					
Longxuyen.....	7					
Mytho.....	54	2				
Rachgia.....	132					
Saigon.....	132	4				
Laos.....	12	20				
Tonkin.....	1	19				
Pakistan.....	23,419	220	40			
Chittagong.....	34					
Karachi.....	2					
Lahore <sup>4</sup> .....	2,634					
Siam.....	40	2	1			
Syria.....	3					

<sup>1</sup> Suspected.<sup>2</sup> Includes imported cases.<sup>3</sup> Deaths.<sup>4</sup> Lahore City and District.

## PLAGUE

(Cases)

AFRICA					
Belgian Congo.....	15	1	1		
British East Africa:					
Kenya.....	16	8			
Tanganyika.....	275	3			
Madagascar.....	346	1		2	
Tamatave.....	1				
Tananarive.....	30			1	
Rhodesia, Northern.....	26				
Union of South Africa.....	37				
ASIA					
Burma <sup>2</sup> .....	524	62	13	1	1
Mandalay.....	17				
Rangoon.....	15	2	1	1	
China:					
Chekiang Province.....	27	3		1	
Wenchow.....	8	2		1	
Fukien Province.....	291	38			
Foochow.....	4				
Kiangsi Province.....	19				
Kwangtung Province.....	112				
Yunnan Province.....	72				

See footnotes at end of table.



## PLAGUE—Continued

Place	January- June 1948	July 1948	August 1948—week ending—			
			7	14	21	28
ASIA—continued						
India.....	19,816	4 175	4 27	4 46		
Indochina (French):						
Annam.....	142					
Cambodia.....	1	2				
Cochinchina.....	40	3				
Laos.....	2					
Mountain Area South-Indochina.....	12					
Java.....	652	4 10		4 2		
Pakistan.....	11					
Siam.....	103	10	1			
EUROPE						
Portugal: Azores.....	9	1				
SOUTH AMERICA						
Argentina.....	12					
Buenos Aires Province.....	9					
Ecuador.....	15	3				
Chimborazo Province.....	1					
Loja Province.....	14	3				
Peru.....	22					
Cajamarca Department.....	11					
Huacho Department.....	1					
Libertad Department.....	1					
Lima Department.....	5					
Venezuela:						
Aragua State.....	7					
OCEANIA						
Hawaii Territory: Plague-infected rats <sup>3</sup> .....	5					

<sup>1</sup> August 1-10.<sup>2</sup> Includes 4 cases of pneumonic plague.<sup>3</sup> Includes imported cases.<sup>4</sup> Preliminary figures.<sup>5</sup> Plague infection was also reported in Hawaii Territory, under date of Feb. 27, 1948, in a mass inoculation of tissue from 19 rats.

## SMALLPOX

(Cases)

(P = present)

AFRICA					
Algeria.....	206	30			
Angola <sup>1</sup> .....	122				
Basutoland.....	3				
Belgian Congo <sup>1</sup> .....	1,229	195			
British East Africa:					
Kenya.....	87	12			
Nyasaland.....	2,635	434	86	79	
Tanganyika.....	674	71			
Uganda.....	193	9			
Cameroon (French).....	3				
Dahomey.....	271	17		2 9	3 16
Egypt <sup>4</sup> .....	465	8			
Eritrea.....	9				
Ethiopia.....	1				
French Equatorial Africa.....	13	1			
French Guinea.....	124	1		2 3	3 1
French West Africa: Haute-Volta.....	418	4		2 24	
Gambia.....	27				
Gold Coast.....	947	87	5		
Ivory Coast.....	521	46		2 21	3 1
Libya.....	255				
Mauritania.....	1				
Mauritius.....		1			
Morocco (French).....	32	1			
Mozambique.....	50	77			
Nigeria.....	3,444				
Niger Territory.....	328	1			
Rhodesia:					
Northern.....	351	129			1
Southern.....	493				1
Senegal.....	8				
Sierra Leone.....	153	2			

See footnotes at end of table.

## SMALLPOX—Continued

Place	January-June 1948	July 1948	August 1948—week ending—			
			7	14	21	28
AFRICA—continued						
Sudan (Anglo-Egyptian) <sup>1</sup> .....	1,186	116	41	22	12	
Sudan (French).....	16					
Swaziland.....	5					
Togo (British).....	9					
Togo (French).....	85	6				
Tunisia.....	512					
Union of South Africa.....	25	P	P	P		
ASIA						
Arabia.....	8					
British North Borneo.....	1					
Burma <sup>4</sup> .....	2,569	100	16	3		
Ceylon <sup>4</sup> .....	19					
China.....	3,549	123	11	3	1	
India.....	51,933	3,017	266	218		
India (French).....	6					
India (Portuguese).....	131					
Indochina (French).....	2,556	620	432	52	108	
Iran.....	491	27		4		
Iraq.....	686	45	8	24	24	
Java.....	1					
Japan.....	19	7				
Lebanon.....	57					
Malay States (Federated).....	407	11				
Manchuria.....	78					
Pakistan <sup>4</sup> .....	11,249	209				
Palestine.....	8					
Siam.....	488	3				
Straits Settlements.....	11					
Sumatra.....	1,472	223				
Syria.....	48	15	1		1	
Transjordan.....	13					
EUROPE						
France.....	3					
Germany.....	3					
Portugal.....	69					
Spain.....	19					
Canary Islands.....	9					
NORTH AMERICA						
Guatemala.....	2					
Mexico.....	896	6 12	6 2	6 2		
SOUTH AMERICA						
Argentina.....	9	7 1				
Bolivia.....	31					
Brazil.....	38	6 4				
Chile.....	5					
Columbia.....	4,408	568	6 6	6 7		
Ecuador <sup>1</sup> .....	2,184	238				
Paraguay <sup>1</sup> .....	76					
Peru.....	253					
Trinidad.....	10 12					
Venezuela <sup>1</sup> .....	3,297	11 21			10 12 45	

<sup>1</sup> Includes alastrim.<sup>2</sup> Aug. 1-10, 1948.<sup>3</sup> Aug. 11-20, 1948.<sup>4</sup> Includes imported cases.<sup>5</sup> Imported.<sup>6</sup> In Mexico City only.<sup>7</sup> In Buenos Aires.<sup>8</sup> In Porto Alegre.<sup>9</sup> In Cartagena.<sup>10</sup> Alastrim.<sup>11</sup> In ports only.<sup>12</sup> In Santa Barbara, Barinas State, July 28-Aug. 11, 1948

## TYPHUS FEVER\*

(Cases)

(P=Present)

AFRICA					
Algeria.....	138	10			
Basutoland.....	8				
Belgian Congo.....	152	14			
British East Africa:					
Kenya <sup>1</sup> .....	53	14			
Zanzibar.....		1			
Egypt.....	271	16			
Eritrea.....	33	11			

See footnotes at end of table.

## TYPHUS FEVER—Continued

Place	January-June 1948	July 1948	August 1948—week ending—			
			7	14	21	28
<b>AFRICA—continued</b>						
Ethiopia.....	8					
Gold Coast.....	2					
Libya.....	366	68	1	4	2	
Morocco (French).....	65	8				
Morocco (International Zone).....	2					
Morocco (Spanish) <sup>1</sup> .....	3					
Mozambique <sup>1</sup> .....	3					
Nigeria <sup>1</sup> .....	5					
Rhodesia (Southern).....	2					
Senegal.....	2					
Sierra Leone.....	7	1				
Somalia.....	1					
Tunisia <sup>1</sup> .....	553	17				
Union of South Africa <sup>1</sup> .....	179	P	P	P		
<b>ASIA</b>						
Burma.....	5					
China <sup>1</sup> .....	115	30		1	3	
India (Portuguese).....	5					
Indochina (French) <sup>1</sup> .....	31	11	2	2	2	
Iran <sup>1</sup> .....	105	14		1		
Iraq <sup>1</sup> .....	148	20	7	11	21	
Japan.....	428	23				
Java.....	3					
Manchuria.....	39					
Pakistan.....	22					
Palestine <sup>1</sup> .....	12					
Philippine Islands <sup>1</sup> .....	1	4				
Straits Settlements <sup>1</sup> .....	12	4				
Syria <sup>1</sup> .....	42	12				
Transjordan.....	55	9				
Turkey (see Turkey in Europe).....						
<b>EUROPE</b>						
Albania.....	15					
Bulgaria.....	660	47	1	8		
Czechoslovakia.....	6	1				
France.....	3	2				
Germany.....	14	3				
Great Britain:						
Cyprus.....	1					
England and Wales.....	1	4				
London.....	2	4				
Ireland (Northern).....	1					
Malta <sup>2</sup> .....	1	2				
Greece <sup>1</sup> .....	10					
Hungary.....	72	13	12	8	13	
Hungary.....	45	5				
Italy <sup>1</sup> .....	129	15				
Sicily.....	4					
Netherlands.....	2	1				
Poland.....	230	11				
Portugal—Madeira Islands:						
Funchal.....	1					
Rumania <sup>1</sup> .....	21,494	138				
Spain.....	12	5				
Turkey.....	245	19	3	4	9	
Yugoslavia.....	525	24	4	8		
<b>NORTH AMERICA</b>						
Costa Rica <sup>2</sup> .....	7					
Cuba <sup>2</sup> .....	12	5				
Guatemala.....	89					
Jamaica <sup>2</sup> .....	8	3				
Mexico <sup>1</sup> .....	985	7	28	75		
Panama Canal Zone <sup>1</sup> .....	3					
Puerto Rico <sup>2</sup> .....	27	1				
<b>SOUTH AMERICA</b>						
Argentina.....	20					
Bolivia.....	105					
Brazil.....	96	8				
Chile <sup>1</sup> .....	166	9				
Colombia.....	1,599	322	10	1		
Curacao <sup>1</sup> .....	12	1				
Ecuador <sup>1</sup> .....	285	36				
Peru.....	214					
Venezuela.....	102	7			7	

See footnotes at end of table.

**TYPHUS FEVER—Continued**

Place	January-June 1948	July 1948	August 1948—week ended—			
			7	14	21	28
OCEANIA						
Australia <sup>1</sup> .....	114	12				
Hawaii Territory.....	6	3				
New Caledonia.....	1					

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

- <sup>1</sup> Includes murine type.      <sup>3</sup> In Shanghai.      <sup>5</sup> Suspected.      <sup>7</sup> In sea- and air-ports only.
- <sup>2</sup> Murine type.              <sup>4</sup> Imported.      <sup>6</sup> Includes suspected cases.
- <sup>8</sup> Includes 9 deaths reported as cases in Cochabamba Department in March 1948.
- <sup>9</sup> In Valparaiso.            <sup>10</sup> In Cartagena.    <sup>11</sup> Corrected figure.

**YELLOW FEVER**

(D=Deaths)

AFRICA					
Gold Coast:					
Kumasi.....	D	1			
Accra.....	D		<sup>1</sup>	<sup>1</sup>	
Ivory Coast:					
Gagnoa.....	D	1			
SOUTH AMERICA					
Argentina:					
Cerro Azul, Misiones Territory.....	D	1			
Brazil:					
Sao Luiz Gonzaga, Rio Grande do Sul State	D	1			
Colombia:					
Antioquia Department:					
Maceo.....	D	4			
Yolomba.....	D	1			
Boyaca Department:					
Camperhemoso.....	D	1			
Caldas Department:					
La Dorado.....	D	1			
Samana.....	D	1			
La Victoria.....	D	1			
Cundinamarca Department:					
Medina.....	D	7			
Intendencia of Meta:					
Cumara.....	D	1			
Restrepo.....	D	1			
San Martin.....	D	1			

- <sup>1</sup> Suspected.
- <sup>2</sup> Stated to have been infected in Achimota.
- <sup>3</sup> Stated to have been infected in Christiansborg.

**DEATHS DURING WEEK ENDED AUG. 28, 1948**

[From the Weekly Mortality Index, issued by the National Office of Vital Statistics]

	Week ended Aug. 28, 1948	Corresponding week, 1947
<b>Data for 93 large cities of the United States:</b>		
Total deaths.....	8,702	8,388
Median for 3 prior years.....	8,388	
Total deaths, first 35 weeks of year.....	325,766	326,903
Deaths under 1 year of age.....	699	713
Median for 3 prior years.....	713	
Deaths under 1 year of age, first 35 weeks of year.....	23,430	26,202
<b>Data from industrial insurance companies:</b>		
Policies in force.....	70,939,272	67,209,417
Number of death claims.....	9,590	11,265
Death claims per 1,000 policies in force, annual rate.....	7.1	8.7
Death claims per 1,000 policies, first 35 weeks of year, annual rate.....	9.5	9.4