

RECENT TRENDS IN MORTALITY IN THE UNITED STATES¹

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ALTHOUGH the death rate cannot be taken as an adequate criterion of the health of the population, the continued low level of mortality through the fifth year of the depression has been both surprising and encouraging. Undoubtedly we are justified in accepting it as a favorable sign that, in general, unemployment, lowered standards of living, and even privation have not produced a rising death rate. However, gross death rates for a population of 126 million may easily conceal unfavorable conditions affecting only certain elements in the population, and downward trends in the mortality for some groups may offset a rising mortality for other groups. The data are not available for any complete interpretation of the death rate during the past few years, but an analysis of the trends in the mortality from the principal causes of death and the extent to which the decline in deaths has affected different age groups gives us at least a clearer picture of what has been happening. Also, data from the large industrial insurance companies provide an index of mortality for the wage-earning class which is of considerable interest when compared with mortality in the general population. When the death rates for certain specific groups are considered, it becomes apparent that all have not shared equally in the improvement in mortality.

The gross death rate for each of the past five years has been lower than in any pre-depression year. From 1930 through 1933, the death rate in each year was slightly lower than in the preceding year, the rates being 11.3, 11.1, 10.9, and 10.7 per 1,000 popu-

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lation. But in 1934, deaths increased and in eighty-six large cities the death rate was about 4 per cent higher than in 1933 and also higher than in 1932. This increase in deaths in 1934 was the result of mortality being on a generally higher level throughout the period from February through July than in the corresponding months of the previous year. Furthermore, the higher mortality is found to have affected sixty-nine of the eighty-six cities. Of the seventeen cities showing no increase, all but five are in New England, New York, or New Jersey, and most of these had shown an increase in 1933 over the 1932 rates.

For the first six months of 1934, which includes most of the period when the excess mortality occurred, preliminary data are available for twenty-four states, including about 80 million population.² These indicate that the important causes of death which showed large increases were pneumonia (18 per cent) and heart diseases (10 per cent), while cancer, diabetes, cerebral hemorrhage, and nephritis showed smaller increases. The infant death rate for twenty-six states was 5 per cent higher than for the corresponding period of 1933, and deaths from diarrhea and enteritis under two years of age also increased, although the summer months, when the disease is especially prevalent, are not included. Also mortality from both measles and whooping cough was higher than in any of the preceding three years. So great an increase in pneumonia deaths is unusual at a time when there was no widespread epidemic of respiratory conditions (influenza deaths were about 40 per cent fewer than in the preceding year).

The following comment on the increased mortality in the *Public Health Reports*² is of interest: "It is not possible to assign reasons for the increased death rates. Decreases in mortality have occurred for many years and the low record of 1933 may stand

²Mortality From Certain Causes During the First Half of 1934. *Public Health Reports*, United States Public Health Service, November 9, 1934.

for some time. Some of the increase in 1934 may be associated with increased industrial activity and its attendant exposure of workers to accidents and other hazards. On the other hand, the severe weather of the first half of 1934, occurring when many of the unemployed were ill-equipped with clothing and shelter to withstand the exposure, may have contributed to the high pneumonia and certain other death rates. Possible lowered resistance to disease in this element of the population may also have played its part."

But the death rate in 1934, though higher than in the previous two years, is still lower than that for any pre-depression year. These low death rates have led some to conclude that, rather than undermining health, the depression has had a beneficial effect on the health of the nation. This is probably true for some groups of people and the decline in some causes of deaths, such as industrial accidents, is a direct "benefit" of the depression. However, mortality rates for the population as a whole and from all causes conceal indications of less favorable mortality trends which affect only some groups in the population.

Thus, among insured persons in wage-earners' families, the mortality in the past five years has not decreased as for the general population, which suggests that conditions have been less favorable for this large group than for the population as a whole. Death rates reported by industrial insurance companies showed no decline in 1931 and 1932, the rates per 1,000 policies being 9.6 in each year; in 1933 the rate increased to 9.8 although the rate for the general population declined, and in 1934 the rate was again 9.8. These rates are for the families of wage-earners who could afford to continue payments on their insurance policies and, therefore, do not represent the families which have suffered most from the depression. In the two years 1932 and 1933, the number of policies in force in these industrial companies declined from 74 to 67 million, a decrease of about 7 million, or approximately

10 per cent. Obviously the people hardest hit financially were being gradually eliminated from the policy holders.³

The only data on mortality among families of the unemployed have been furnished by surveys of wage-earning populations in ten industrial localities which were made by the United States Public Health Service and the Milbank Memorial Fund early in 1933. A history of deaths for the four years 1929 to 1932 was obtained, and a comparison has been made of the death rates for two groups of families classified according to the 1932 employment status. Families with no employed worker or with only part-time workers reported a death rate for the two years 1931-1932 43 per cent higher than that reported by families with at least one full-time worker. Mortality for the two groups in 1929 and 1930 was approximately the same, but the death rate increased in 1931 and 1932 for the families without full-time workers and a decline occurred in families with a full-time wage-earner.⁴

CAUSES OF DEATH WHICH HAVE DECLINED

The downward trend of mortality during the depression years is the result of very striking decreases in deaths from a few causes. Deaths from tuberculosis and accidents, both of which are among the leading causes of death, have been reduced, and diphtheria, typhoid fever, diarrhea and enteritis, though not so important as causes of death, have shown proportionately larger decreases.

³A change in the age distribution of policy holders may have resulted from this great decline in policies in force, but it is unlikely that all the difference in the trend for this group and for the general population would be accounted for by an increase in the proportion of old people among those still insured.

⁴These are preliminary data on the mortality during four years among nearly 50,000 persons for whom illness rates during three months of 1933 have been published. Cf. Perrott, G. St. J., and Collins, Selwyn D.: *Sickness and the Depression*. The Milbank Memorial Fund *Quarterly*, October, 1933; January, 1934; July, 1934; Perrott, G. St. J., Collins, Selwyn D., and Sydenstricker, Edgar: *Sickness and the Economic Depression*. *Public Health Reports*, United States Public Health Service, October 13, 1933. Reprint 1598. Mortality data for a much larger population are being tabulated and will be made available later.

Changes in mortality over a short period can be much better understood if set against a background of trends over a longer time period. It is of interest to consider each of these causes briefly in relation to such a background.

Tuberculosis deaths have been declining for many years, and one might say that the campaign against this disease has been the cornerstone of the modern public health movement. From 1921 to 1927, the latest pre-depression year that was not affected by widespread respiratory epidemics, the tuberculosis mortality declined 20 per cent, and from 1927 to 1933, it declined 27 per cent. Studies have shown that tuberculous infection is less widespread now than even ten years ago. It is believed that facilities for diagnosis of the disease in its early stages and provision of sanatoria for care and isolation of cases of infectious tuberculosis have been effective preventive measures. These preventive measures have continued to function with little or no abatement throughout the depression period.

Deaths from accidental causes were on the increase throughout the decade 1920 to 1929 and reached a high point in 1929. From 1929 to 1932 they declined 12 per cent in the registration states of 1920, and in the same period accidental deaths among industrial policy holders of the Metropolitan Life Insurance Company declined 15 per cent. There was some decline in automobile accidents, but most of the decline was in other accidents, presumably these were chiefly industrial. There was a small increase in accidental deaths in 1933 and again in 1934. As industrial activity increases and improved economic conditions stimulate automobile travel, it seems very probable that accidental deaths will continue to rise.

The benefits of extensive immunization against diphtheria are vividly revealed in the decline in the death rate from this disease. Even though widespread use of immunization was started less than ten years ago, we now begin to foresee the virtual elimina-

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tion of this disease. From 1927 to 1933 the death rate in the registration states of 1920 declined from 7.8 to 3.1 per 100,000, a drop of about 60 per cent. While diphtheria is a small part of the total death rate, this has meant a saving of the lives of about 5,000 children annually.

Deaths from diarrhea and enteritis among infants and young children have been declining since the beginning of the twentieth century, and from 1929 to 1933 the same general trend is shown. The continued decline in these and other infant deaths during the depression is convincing evidence that the efforts of public health and relief groups to protect infants against some of the effects of poverty have been successful. Preliminary data indicate that the decline in infant deaths was halted in 1934.

One small contribution to the decline in the total death rate has resulted from the marked drop in the birth rate. Although the death rate from maternal causes among women who bore a child has not decreased, the number of women dying from child-birth decreased 20 per cent from 1930 to 1933.

These improvements in mortality may be summed up briefly. Deaths from tuberculosis, diarrhea and enteritis, typhoid fever, and diphtheria, which accounted for about 7 per cent of all deaths, dropped 24 per cent from 1930 to 1933 compared with a decline of 13 per cent in the preceding three-year period. Deaths from accidents accounted for another 7 per cent of the total in 1930 and declined 12 per cent from 1929 to 1932. The improvement in the death rate from these causes was as great among the industrial policy holders of the Metropolitan Life Insurance Company as among the general population.

When the influence of these few causes of death on the general death rate is eliminated, we find that the death rate from all other causes for the population of the registration states of 1920 remains on a level during the depression years and is approximately the same as in 1923, 1924, 1925, and 1927, earlier years

which were also free of definite respiratory epidemics. But for the industrial policy holders of the Metropolitan Life Insurance Company the death rate from all other causes has increased during the past five years.

CAUSES OF DEATH WHICH HAVE INCREASED

The specific causes of death which have shown the principal increases in the years since 1930 are diabetes, cancer, and heart diseases. All of these diseases have caused an increasing number of deaths over a long period. Part of this increase has been due to our aging population, but the increase has exceeded an amount which could be accounted for in this way. A study⁵ of the rising mortality from these diseases made a few years ago showed that the death rates from heart diseases and cancer increased considerably between 1921 and 1927, at ages as young as 35 to 44, especially among males. For diabetes the increase began in the age group 55 to 64.

In the period from 1930 to 1933, the rate of increase in the mortality from diabetes and cancer was faster than in the preceding three-year period from 1927 to 1930 for the population of the registration states of 1920. Thus, the death rate from diabetes in 1933 was 15 per cent higher than in 1930, whereas the rate in 1930 was only 10 per cent higher than in 1927 and a similar increase of 10 per cent occurred between 1924 and 1927. The death rate from cancer in 1933 was about 7 per cent higher than in 1930 as against an increase of 4 per cent in the preceding three-year period, but the same as the increase from 1924 to 1927.

It is not apparent why the rate of increase in mortality from diabetes and cancer should be accelerated during these depression years. One possible explanation is that lack of early medical care has been a factor, since both are diseases which, if medical care

⁵Wichl, Dorothy G.: Some Recent Changes in the Mortality Among Adults. *Journal of Preventive Medicine*, iv, No. 3, May, 1930.

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is neglected or sought too late, may advance to the fatal stage quite rapidly.

Among the industrial policy holders of the Metropolitan Life Insurance Company, between 1930 and 1933, the percentage increase in the crude mortality rates from these causes was much greater than for the general population, although in the three-year period from 1927 to 1930 the rate of increase had been similar. For this insured wage-earning group, the diabetes death rate increased 30 per cent and the cancer rate 20 per cent, compared with 15 and 7 per cent respectively for the general population. Some of this difference is to be explained by a less favorable age distribution of the policy holders⁶ but the general indication seems to be that the increase in mortality from these diseases has been greater among the wage-earning group. The increase in both cancer and diabetes deaths was especially marked from 1930 to 1932, and rates adjusted for age for 1933 and 1934 show a slight decline in the mortality from both these diseases in 1934 among the insurance group.

Although mortality from heart diseases and other circulatory conditions increased 5.5 per cent from 1930 to 1933 in the registration states of 1920, this is a slightly lower rate of increase than was recorded from 1927 to 1930. Early indications are that the death rate from these diseases has risen again in 1934.

MORTALITY CHANGES FOR SPECIFIC SEX-AGE GROUPS

The diseases which have increased are important causes of mortality chiefly at the older ages, while those that have decreased are among the principal causes of death in middle life and in childhood. Therefore, it is not surprising to find that persons of different ages have shared very unequally in the improvement in mortality and that at some ages there has been no improvement.

⁶Data for mortality among industrial policy holders of the Metropolitan Life Insurance Company are from the *Statistical Bulletin*, Metropolitan Life Insurance Company, January, 1935.

Before discussing in detail the change in mortality at specific ages, it will be helpful to review very briefly the trends in the mortality for specific sex-age groups which had been evident for the previous decade and to some extent for a much longer period. From 1921 to 1930, death rates for adult males in the age groups 25 to 34 and 35 to 44 had remained about on a level, and at older ages the rates had shown a steady increase. For women, on the other hand, death rates had declined in the age groups 25 to 34 and 35 to 44; and above 45 years of age, although the rates had shown an increase, the percentage increase was less than for males. As a result, the difference between the male death rate and the female rate in adult ages had been widening.

The percentage changes in the mortality rates for specific sex-age groups between 1930 and 1933 are shown in Figure 1 and are compared with the changes in the three-year period, 1927-1930. The total mortality for all ages combined declined a little over 5 per cent for both males and females in the depression period, and at specific ages a decline is shown for males up to age 55 and for females up to age 65. The rate of decline decreases, in general, with advancing age. Only for persons 75 years of age or over of either sex is the trend of mortality less favorable in the later period (1930-1933) than it was in the three years preceding 1930.

The most striking improvement in mortality, aside from the accelerated drop in childhood mortality, is the decrease in the death rates at ages 15-24 both for males and females, and the decrease among males at ages 25 to 34 and 35 to 44. It is in these age groups that mortality from tuberculosis and accidents is heaviest and the decline in these causes, as already noted, has contributed a major share of the decline in mortality.

The trend in the mortality for males at all ages except in childhood has been relatively more favorable than for females during the depression years when the changes which have occurred are considered in relation to the trends in previous years in the mortality

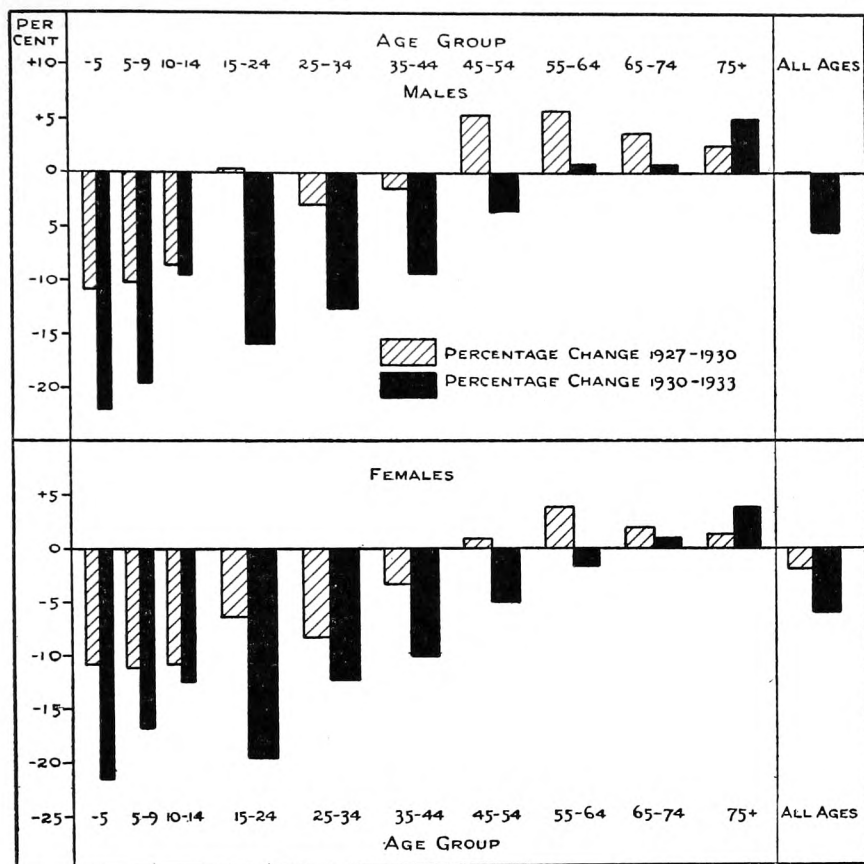


Fig. 1. The percentage change in the mortality for specific sex-age groups in the registration states from the period 1930 to 1933 compared with the percentage change from 1927 to 1930.

at specific ages. Thus, at ages 35 to 44 the decline for both males and females was about 10 per cent from 1930 to 1933, but in the preceding three-year period the decline for males had been less than one-half that for females.

SUMMARY

General mortality in the United States from 1930 to 1934 has been somewhat lower than in any pre-depression year but the 1934 death rates for eighty-six large cities was higher than in 1933 or 1932, though no widespread epidemic occurred. There

have been fewer accidental deaths, a natural corollary to the reduced industrial activity, and tuberculosis, diphtheria and other childhood diseases have continued the downward trend which had been in progress a number of years. Mortality for young and middle-aged adults, especially males, shows the greatest improvement since these ages benefit most by a reduction in accidents and tuberculosis deaths.

On the other hand, deaths from diseases of middle life and old age, especially diabetes, cancer, and heart diseases, have increased during the depression, and for cancer and diabetes the rate of increase has been greater than in the years immediately preceding. This has produced a rising death rate at older ages, which, however, has exceeded the expected increase only for the age group 75 and over.

Mortality for industrial policy holders has shown a less favorable trend than for the population as a whole. In a group of families of wage-earners in ten cities, a special survey showed that death rates were 43 per cent higher in 1931 and 1932 among those with no full-time worker than among those with a full-time worker.