

## CHANGE IN MORTALITY TREND IN THE UNITED STATES AND CERTAIN OTHER COUNTRIES

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After a long period of rapid decline in mortality, the downward trend lost its momentum during the 1950 decade in the United States (See Figure 1). The death rate began to level off about 1950 and has been stagnant for the past 15 years.

A number of countries under enemy occupation experienced excess mortality during the war years, but after the cessation of hostilities there appeared to be a resumption of the downward trend of the prewar period. However, in the 1950 decade a marked slowing down in the rate of decline began to take place. The same phenomenon has occurred elsewhere. There has been either a marked change in the rate of decline or relatively little change in the death rates since 1950 in the following countries: Sweden, Finland, Norway, Denmark, the Netherlands, England and Wales, Austria, Belgium, Czechoslovakia, France, Italy, Chile, Japan, Australia and New Zealand. The movement of the death rate in recent years has been distinctly upward in Norway, the Netherlands and Denmark.

In the United States, the change in trend has occurred in the death rates for both males and females, and for whites and nonwhites. The death rate has leveled off for residents of almost every State. In a number of States, the crude death rate is now rising.

The leveling off effect may be seen in the death rate for each age group up to 55 years (See Figure 2). The effect is much more marked in the younger ages where the slope of the trend line has been steeper.

Of particular interest and significance is the trend of the infant mortality rate (See Figure 3). During the period 1933 to 1949, the infant mortality rate for the United States decreased about 4 percent each year. Beginning about 1950, the rate of decrease in infant mortality dropped to 1 percent per annum. For nonwhite infants the deceleration in the downward trend is even more marked. During the years 1933 to 1949, the mortality rate for nonwhite infants decreased 4.6 percent per annum. Between 1950 and 1964, the rate of decline slowed down to 0.6 percent per year. As a consequence, the gap between the rate for white and nonwhite infants has widened during the past decade.

The trend of neonatal mortality rates as well as that for the postneonatal period has been affected. The infant mortality rate for residents of urban places has leveled off as has the rate for rural residents. The change in infant mortality trend has not been limited to any particular section of the country, although the degree of leveling off of the rates has not been uniform.

Because of the change in the infant mortality trend in the United States, the present situation in this country is less favorable relative to other countries than was the case 25 to 30 years ago. The infant mortality rate for the United States is currently significantly higher than the rates for the various Scandina-

vian countries, the Netherlands, Switzerland, England and Wales, Australia, New Zealand and several other countries such as Japan, Czechoslovakia and France. Although there are indications of changes in trend for other countries such as Australia, England and Wales, New Zealand, Norway and Sweden, these changes are not nearly as great as those experienced in the United States. On the other hand, the rates for other countries of low mortality continue to decline. Therefore, the United States is steadily losing ground with respect to its international ranking of infant mortality rates.

There are a number of possible reasons for the change in the mortality trends. For example, it is possible for the death rate to level off as a result of changes in completeness of death registration, definitions or in statistical practices. It may be due to errors in intercensal population estimates, or in the statement of age on death certificates or in the census enumeration. However, there does not seem to be any evidence to support the view that the changes in trend are statistical artifacts.

The studies of mortality trends in the United States, England and Wales and in Chile indicate that the leveling off of the death rates can be accounted for by a combination of two sets of factors. The first is the dramatic drop in the death rates for diseases of infectious origin with the successive introduction and application of pneumonia serum therapy, the sulfa drugs and the antibiotics. The accelerated decline started about 1938 and then lost its impetus in the 1950's. By that time, the mortality from diseases of infectious origin had reached a level where it no longer contributed in a major way to the total number of deaths. Even if the trend of the death rates for the infective and parasitic diseases, including pneumonia and influenza, had continued downward without interruption, this would not have accounted for all of the leveling off of the total death rate.

The long-term decline in mortality from the infectious diseases resulted in a major realignment of the principal causes of death which uncovered a second set of factors. These factors involve the trends of mortality from the presently numerically important causes of death, namely, malignant neoplasms and cardiovascular-renal diseases at all ages, congenital malformations through the childhood years, accidents and other violence from childhood through middle age, cirrhosis of the liver in middle age, and diabetes mellitus from middle age into old age. Also, new problems are emerging. The dramatic upward trend of the chronic bronchopulmonary disease mortality from middle age onward seems particularly significant. The combined effect of these various trends is to slow down the rate of decline of the total death rate.

It is difficult to determine precisely the roles played by the different factors in affecting the general mortality trend. The indications are that the leveling off of the death rates for

the infective and parasitic diseases, influenza and pneumonia, and the other diseases of the respiratory system did not account for a large part of the deceleration of the rate of decline of the death rates for all causes for most age groups. Much more important seem to be the trends for the chronic diseases such as cardiovascular-renal diseases and malignant neoplasms in the adult population, malignant neoplasms and accidents and other violence in the younger population, and congenital malformations among children. These diseases and conditions constitute the hard core for which prevention of deaths is more difficult.

An interesting and important question is why the rate of decline of the pneumonia death rate changed during the past decade after a period of impressive decrease. These changes in the rate for age groups in which the death rate has reached a low level are understandable. However, the pneumonia death rates are still high for the older age groups, and for infants and preschool children. Similarly, the rates for nonwhites are still higher than those for whites and the rates for males are higher than those for females. There is considerable spread in the level of the death rates for the various age, color, and sex groups, but the leveling off of the pneumonia death rate for all groups has taken place about the same period. This parallelism in the trends by sex, color, and age appears too regular to be true. It seems strange that these changes should have occurred at about the same time. For some segments of the population the pneumonia death rates are so low that for all practical purposes, the notion of an irreducible minimum can be accepted. For the other subgroups of the population, it would seem that there should be further prospects of reduction in the death rate. Actually, the pneumonia death rate is now increasing for the older age groups, indicating the possibility of antibiotic-resistant organisms playing an increasing role in older pneumonia patients.

With regard to the total death rate, there may be some question as to whether the irreducible minimum has been reached. The examination of the death rates by cause of death indicates that further declines are possible. Also, comparison of death rates by age and sex for the various countries of low mortality for the years 1959 and 1960, depending upon their availability, shows that the structure of the death rate for the United States is far from the lowest. If the lowest age-sex specific death rate achieved

by any country of low mortality in 1959 and 1960 had been obtained in the United States in 1960, there would have been about 397,000 fewer deaths in the United States. This means that the crude death rate for the United States would have been 7.3 per 1,000 population as compared with the recorded death rate of 9.5 per 1,000 population. For males, the expected death rate would have been 7.8 as compared with the recorded rate of 11.0 per 1,000 population. For females the corresponding rates would have been 6.9 as compared with 8.1 per 1,000 population.

It is difficult to say what the biological irreducible minimum is. However, it is obvious that the death rates in the United States are far above the low levels established in the Scandinavian countries and in the Netherlands. Even for these countries, the rates cannot be considered the lowest possible figures because lower mortality rates than those recorded in 1959 or 1960 have been observed for some age groups in the years prior to 1959.

The recent change in the rate of decline of the death rates in the United States does not appear to be a temporary phenomenon. The provisional death rate of 9.4 per 1,000 population in 1964 and 1965 are low relative to past rates, but they are far from the continuation of the downward trend established between 1938 and 1954. Further decreases may be recorded in the future, but it seems unlikely that the death rate for the United States will soon approach the levels already attained by various other countries.

#### Summary and Conclusions

After a long period of rapid and substantial decline, the death rate for the United States has reached the point where further decreases as experienced in the past cannot be anticipated. Similar changes in the trend of the crude death rate may be observed in the data for a number of other countries.

In the United States, the mortality trends for every age group from infancy to late middle age or old age--whites as well as nonwhites, and females as well as males--have changed in recent years.

Further declines in mortality are possible but they are likely to be modest ones. In view of the mortality experience for the past decade, it does not seem likely that the death rate for the United States will soon approach the levels already attained by various other countries.







