ORIGINAL CONTRIBUTION

Trends in Infectious Disease Mortality in the United States During the 20th Century

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Context Recent increases in infectious disease mortality and concern about emerging infections warrant an examination of longer-term trends.

Objective To describe trends in infectious disease mortality in the United States during the 20th century.

Design and Setting Descriptive study of infectious disease mortality in the United States. Deaths due to infectious diseases from 1900 to 1996 were tallied by using mortality tables. Trends in age-specific infectious disease mortality were examined by using age-specific death rates for 9 common infectious causes of death.

Subjects Persons who died in the United States between 1900 and 1996.

Main Outcome Measures Crude and age-adjusted mortality rates.

Results Infectious disease mortality declined during the first 8 decades of the 20th century from 797 deaths per 100 000 in 1900 to 36 deaths per 100 000 in 1980. From 1981 to 1995, the mortality rate increased to a peak of 63 deaths per 100 000 in 1995 and declined to 59 deaths per 100 000 in 1996. The decline was interrupted by a sharp spike in mortality caused by the 1918 influenza epidemic. From 1938 to 1952, the decline was particularly rapid, with mortality decreasing 8.2% per year. Pneumonia and influenza were responsible for the largest number of infectious disease deaths throughout the century. Tuberculosis caused almost as many deaths as pneumonia and influenza early in the century, but tuberculosis mortality dropped off sharply after 1945. Infectious disease mortality increased in the 1980s and early 1990s in persons aged 25 years and older and was mainly due to the emergence of the acquired immunodeficiency syndrome (AIDS) in 25- to 64-year-olds and, to a lesser degree, to increases in pneumonia and influenza deaths among persons aged 65 years and older. There was considerable year-to-year variability in infectious disease mortality, especially for the youngest and oldest age groups.

Conclusions Although most of the 20th century has been marked by declining infectious disease mortality, substantial year-to-year variation as well as recent increases emphasize the dynamic nature of infectious diseases and the need for preparedness to address them.

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OVER THE LAST 100 YEARS, North America and Europe have experienced a substantial decline in mortality and an increase in life expectancy. The "theory of epidemiologic transition" attributes these trends to the transition from an "age of pestilence and famine," in which the mortality pattern was dominated by high rates of infectious disease deaths, especially in the young, to the current "age of degenerative and man-made diseases" in which mortality from chronic diseases predominates.[1,2] According to estimates from the Global Burden of Disease Study, infectious diseases now account for only 4.2% of all disability-adjusted life years lost (DALYs, a measure of the burden of diseases and injuries) in countries like the United States with established market economies, whereas chronic and neoplastic diseases account for 81.0%.[3]

Until recently, it was assumed that the epidemiologic transition had brought about a permanent reduction in infectious disease mortality in the United States. However, the emergence or reemergence in the 1980s of such diseases as the acquired immunodeficiency syndrome (AIDS) and tuberculosis demonstrated that gains against infectious diseases cannot be taken for granted.[4,5] An outbreak of avian influenza in Hong Kong in late 1997 by a strain (H5N1) not previously known to infect humans[6] is a reminder that pandemic influenza continues to pose a threat.

In the United States, mortality due to infectious diseases increased 58% from 1980 to 1992,[7] a trend that was unforeseen. To determine when this trend began and to characterize longer-term trends in the United States, we examined US mortality records since 1900, when the federal government first began to track mortality data annually.

METHODS

Sources of Mortality Data

Data were obtained from yearly tabulations of causes of death on file at the Division of Vital Statistics of the Centers for Disease Control and Prevention's National Center for Health Statistics and from public use mortality data tapes from 1962 through 1996.

The US federal government began publishing mortality statistics on an annual basis in 1900 after establishment of the

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