CHAPTER 15

Human Mortality Throughout History and Prehistory

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Accurate data for estimating life expectancy at birth in sizable populations do not become available until the sixteenth century. For earlier times, the analyst must rely on sources of questionable quality or representativeness: skeletal remains, burial inscriptions, and, after 1300 or so, records of unusual groups such as the European aristocracy or members of religious orders.

Most of these records suggest that life expectancy from prehistoric times until 1400 or so was in the range of 20–30 years. A detailed and comprehensive account of life expectancy estimates through classical antiquity is found in Acsadi and Nemeskeri (1970). The most satisfactory collection of skeletal remains is drawn from the Maghreb peninsula (North Africa, between Egypt and the Atlantic) during the Neolithic period. This population evidently had a life expectancy at birth of about 21 years. Its age pattern of mortality was remarkably similar to that of modern populations at similar levels of mortality (Acsadi & Nemeskeri, 1970, p. 173).

Burial inscriptions, mummies, and skeletons drawn from the Roman Empire suggest that life expectancy was in the twenties for most of the geographic and occupational subgroups falling under its sovereignty. Few of these sources provided an adequate representation of infant deaths, so that some extrapolation to this age is required based on typical age patterns of mortality observed more recently.

Confidence in the range of 20–30 for life expectancy in the era before 1600 is enhanced by the use of demographic models. Since the world's population was growing very slowly during this period, life expectancy at birth was, to a very close approximation, the reciprocal of the birth rate. Given the age pattern of fecundity and the apparent absence of significant antinatal practices, the birth rate was quite unlikely to have fallen outside the range of 0.033–0.050 births per capita per year, implying life expectancies in the range of 20–30 years.

Mortality rates among members of religious orders provide a very useful bridge between antiquity and the advent of modern death statistics. In an unusually well-documented study, Hatcher (1986) shows that mortality among Benedictine monks in Canterbury, England from 1395 to 1505 corresponded to a life expectancy at birth of 22 years. He notes that nutrition, clothing, sanitation, and shelter were much better for this group than for the population as a whole, although its denser living conditions were undoubtedly a negative factor in its survivorship.

The earliest satisfactory series achieving national coverage is based on demographic reconstructions by a group of scholars at Cambridge. Using a large sample of parish registers and adjusting their data to achieve national representativeness, Wrigley and Schofield (1981) provide estimates of life expectancy at birth in England from 1541 to 1875. Their

quinquennial series of life expectancies is plotted in Figure 15.1. It is clear that, by the middle of the sixteenth century, life expectancy was typically in the mid-thirties, with substantial fluctuation from period to period. Some mild secular deterioration, possibly associated with increasing population density and repeated visitations of the plague, is evident for a century and a half, followed by a slow advance. At the dawn of the nineteenth century, life expectancy was about 37 years, much the same level as it had been two centuries earlier. Life expectancy in France in 1800 was about 30 years, a disparity that Fogel (1989) attributes to poorer nutritional standards in France than in England.

The series of English life expectancies in figure 15.1 is completed by using life tables computed from national vital statistics and censuses for England and Wales. It is clear that a steady advance begins just after the turn of the nineteenth century, and accelerates after about 1871–5. After the 1860s, there is no instance in which life expectancy declines from one period to the next. Not only were average conditions improving rapidly, but there was also less slippage from the gains that had been secured.

The first nation to produce reliable measures of mortality based on complete national counts of deaths and population is Sweden. A quinquennial series of Swedish life expectancies at birth beginning in 1778–82 is also plotted in Figure 15.1. While its series begins at a level similar to that of England, Sweden gains an advantage in the course of the nineteenth century, probably because of much less rapid urbanization (urban areas exposed people more frequently to infectious diseases through direct personal contact and indirectly through contamination of water and food supplies). As the urban health

Figure 15.1 Life expectancy, England and Sweden, 1541–1985

For England and Wales: 1741–1875, Wrigley & Schofield (1981, table 7.15); 1876–1970, Case, et al. (1970); 1970–85 (individual years), Keyfitz & Flieger (1990). For Sweden: 1778–1962, Keyfitz & Flieger (1968); 1965–85, Keyfitz & Flieger (1990).

disadvantage is removed through public works during the twentieth century, the series for the two countries converge. As in England, life expectancy advances accelerate in the 1870s; the only instance of backsliding reflects the influenza epidemic after World War I. It has been argued that the acceleration in rates of mortality decline after the 1870s reflects primarily the implementation of personal and public health practices that took advantage of much clearer understandings of the nature of infectious diseases (Ewbank & Preston, 1990; Preston & Haines, 1991).

Thus far in the twentieth century, life expectancy in Sweden has increased by 24 years and in England and Wales by 27 years. These gains are typical for western European countries and areas of overseas European settlement. Increases were larger in southern and eastern Europe, which began the century at lower levels. Italian life expectancy has increased by 32 years, from 43.0 to 74.7, and Czechoslovakian life expectancy by 31 years, from 40.3 to 71.1 (Keyfitz & Flieger, 1990; Preston & Haines, 1991, table 2.3). If we set prehistoric life expectancy at a midrange value of 25 years, it is clear that about half of the progress in European populations since prehistoric times has occurred during the short span of the twentieth century. The only notable setbacks have been the influenza epidemic after World War I and mild reversals in male mortality in eastern Europe during the past two decades associated with alcohol consumption and other factors (Eberstadt, 1989).

The United States completed its death registration system in 1933, the last industrialized country to do so. Nevertheless, it is evident from partial statistics that the course of mortality during this century was quite similar to that of England. In an innovative and convincing analysis, Lee and Carter (1992) show that the pace of decline in American age-specific death rates during the century has been virtually constant right through the 1980s. Projections by the US Census Bureau and Social Security Administration have repeatedly been too conservative about future gains in life expectancy, and it appears that these errors are being repeated in recent forecasts (Preston, 1993).

Developing Countries

Mortality improvements in developing countries during the twentieth century have been even more dramatic than in industrialized countries. The data base is less secure but there is little doubt that turn-of-the-century life expectancy for the aggregate of developing countries was less than 30 years, i.e. in the range that appears applicable to prehistoric populations. In China around 1930, a valuable demographic survey suggests, life expectancy was around 24 years (Barclay, et al., 1976). Intercensal analysis in India indicates a life expectancy of 24–25 years during 1901–11 (Bhat, 1987). Life tables for Taiwan in 1920 give a life expectancy of 27.9 years and for Chile in 1909—one of the most advanced countries of the developing world—a life expectancy of 30.6 years (Preston, et al., 1972).

According to United Nations' (1991) estimates for 1985–90, China has a life expectancy of 69.4 years, India of 57.9, and Chile of 71.5. Taiwan's life expectancy, not available in UN sources, was 73.6 in 1985 (Keyfitz & Flieger, 1990). Thus, the mean increase from a level recorded earlier in this century for these four countries is about 42 years. Life expectancy more than doubled during the century for each of them. Since life expectancy for developing countries as a whole is estimated by the United Nations to be 61.4 years in 1985–90, it is apparent that this doubling also pertains to the aggregate of developing countries. Figure 15.2 presents a regional breakdown of the UN's life expectancy estimates. Even the poorest region, Africa, has a life expectancy (52.0 years) that would have been the envy of Europe at the turn of the century.

In 1909, impressed by recent discoveries in bacteriology and their application to health practices, economist Irving Fisher declared that 'the crowning achievement of science in the present century should be, and probably will be, the discovery of practical methods of making life healthier, longer, and happier than before' (p. 64). As the century closes, there is no doubt about the accuracy of Fisher's prophesy.

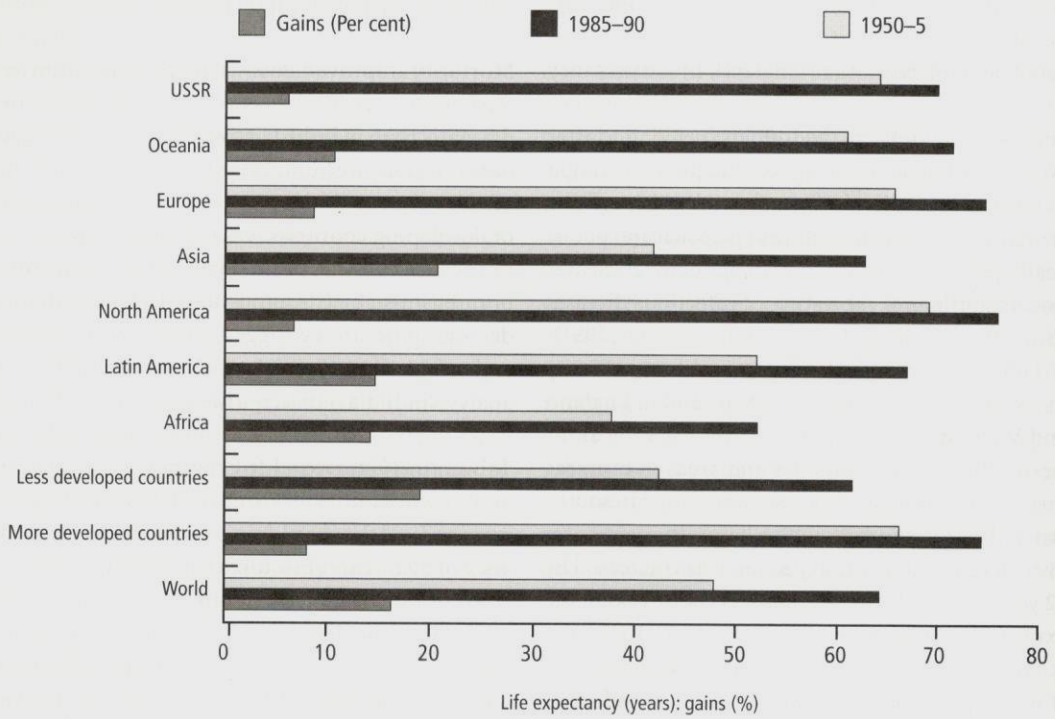

Figure 15.2 Life expectancy around the world, 1950–5, 1985–90, and gains
United Nations (1991, p. 28).

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