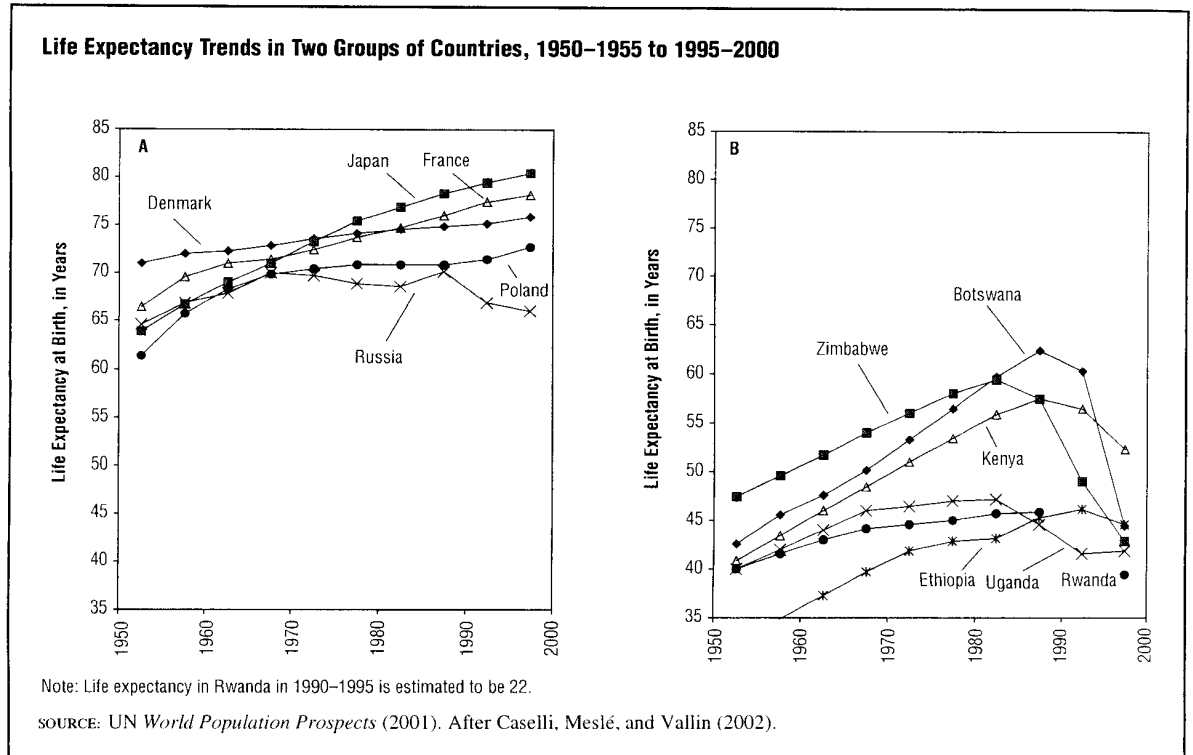


FIGURE 1

MORTALITY REVERSALS

Declining mortality has long been a routine expectation in most of the world, aside from wartime interruptions. Many forecasts envisage a global convergence to low mortality over coming decades. Mortality reversals refer to exceptions to this long-run trend—situations in which the decline ceases or is even reversed.

Until the last decades of the twentieth century, significant mortality reversals were nearly unknown. The only example occurred in Europe in the first half of the nineteenth century during the early stages of the industrial revolution. Since the 1970s, however, many countries have experienced mortality reversals—most remarkably in Eastern Europe, where mortality increased from the 1970s through the 1990s, and in sub-Saharan Africa, with rising AIDS-related mortality beginning in the 1980s. In both regions, adult-age mortality was much more affected than was the mortality of children or the elderly.

Figure 1 displays trends in life expectancy for two groups of countries. Panel A illustrates a widening of the life expectancy gap between Russia and Poland and selected high-income countries.

Panel B shows striking cases of abrupt drops of life expectancy to extremely low levels in Africa.

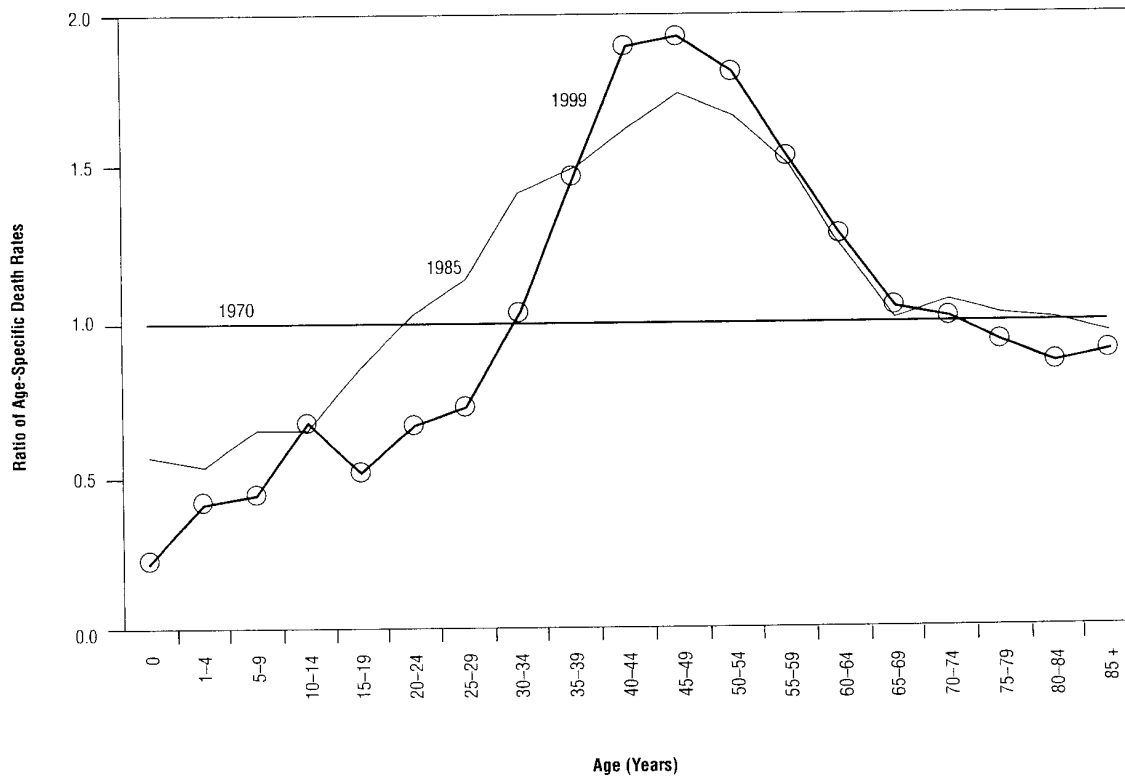
Mortality Reversals in Eastern Europe

Panel A in Figure 1 shows that converging trends in life expectancy between East and West were observed only in the 1950s and the early 1960s. Later the trends in the former Communist countries diverge from those in the market-economy countries. Most remarkably, Russia (and other countries of the former Soviet Union) experienced a gradual decline in life expectancy in the 1970s and a further drop in the 1990s to a low of 66 years. In the 1990s, a previously small gap between Russia and Poland widened, reflecting the probable emergence of a new mortality divide between the former Soviet Union and the rest of Eastern Europe.

The health crisis in Eastern Europe and the former Soviet Union has been analyzed extensively. The effects were seen predominantly in the male population. In the year 2000 male life expectancy at birth in Russia was 59 years—below its level of 60 years in 1955–1956. The corresponding figures for the female population were 72 and 68 years, respec-

FIGURE 2

Proportional Changes in Male Age-Specific Mortality Rates, Hungary: Rates for 1985 and 1999 Compared to 1970



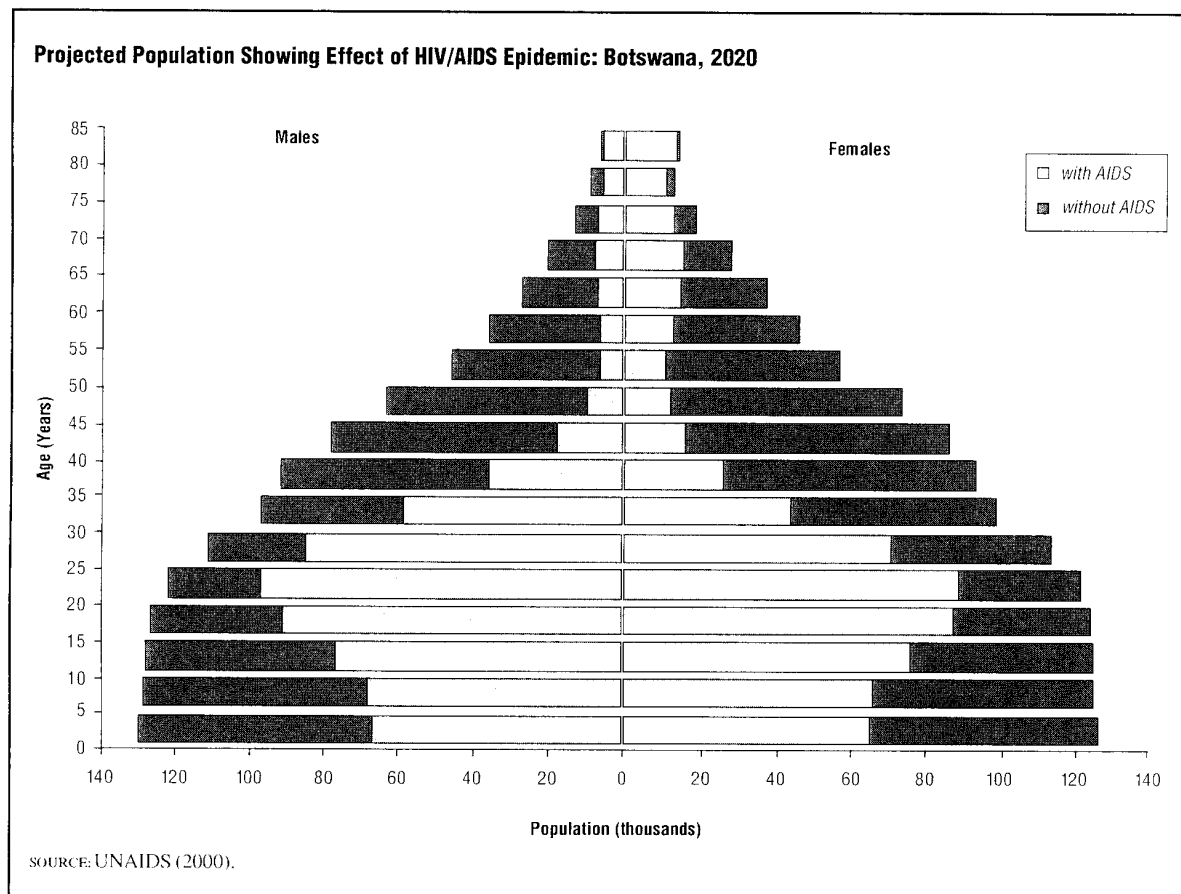
SOURCE: Calculation from data in WHO Mortality Database (2002).

tively. The gender gap in life expectancy varies from 8 to 13 years across the Eastern European region. The concentration of increasing mortality at adult ages is shown for Hungary in Figure 2. In Russia in 2000, men aged 20 had only a 45 percent probability of surviving to age 65; the equivalent probability in Western Europe was about 80 percent.

At the same time, in contrast, child mortality in Eastern Europe has been continuously decreasing. Cardiovascular disease, lung cancer, liver cirrhosis, and other behaviorally-linked diseases and injuries were contributing to the mortality increase at adult ages. In countries of the former Soviet Union, mortality from accidents and violence had reached very high levels by the late 1970s and increased through the 1990s. In the 1990s in Russia, mortality attributed to homicide approached the world's highest levels.

Excess mortality in Eastern Europe has been increasingly concentrated among manual workers and low education groups. It is important to note that the worst patterns of excess mortality affecting population groups in Western countries are quite similar to those in Eastern Europe according to age and cause-of-death structures.

The factors underlying the unfavorable mortality trends probably include lack of preventive health programs and inadequate quality of medical services; smoking and alcohol abuse; general neglect of individual health and other individual societal values; and stress, whether caused by a lack of life choices under the former Communist regimes, or by unemployment, relative deprivation, and inability to cope with the economic challenges of post-Communist times.

FIGURE 3

Mortality Effects of Infectious Disease in Sub-Saharan Africa

Panel B in Figure 1 shows the UN estimates of decreases in the African life expectancies after the late 1980s. Losses are especially high in Zimbabwe and Botswana, bringing life expectancy down to levels not seen in these countries since the 1950s. In Rwanda, the natural trend in life expectancy was severely disrupted by the 1994 genocide and subsequent civil war.

Regular mortality statistics are generally unavailable in the region. Existing estimates are based on household surveys or censuses that include questions about recent household deaths, orphanhood, and survival of children, and *verbal autopsy* questions on causes of death. Mortality increases are found mostly among young adults. The male probability of death between ages 15 and 55 in Zimbabwe increased from 0.15 in the mid-1980s to 0.5 in the late 1990s. The probability of dying between ages 20

and 60 doubled in Uganda and Zambia. In rural Uganda, mortality rates among HIV-positive adults were 15 times higher than those among HIV-negative adults and the probability of death between ages 20 and 60 was about 0.5. Adult mortality rose substantially in East, Central, and Southern Africa; adult mortality also rose in West Africa, but to a far lesser extent. Survey data also show increases in child mortality in countries with the highest prevalence of HIV.

High levels of adult-age mortality and consequent drops in the number of children born will result in profound changes in future population size and age structure, as indicated in the projections for Botswana given in Figure 3.

The factors facilitating a rapid spread of HIV/AIDS in the region are poverty, lack of education, spread of violence, increased spatial mobility (inducing greater promiscuity), gender inequalities, and inadequate health systems.

Poverty increases the risk of infectious diseases in general. Low education is an obstacle to promoting healthy behavioral patterns.

Wars, which have affected many countries in the region, spread HIV through increased prostitution and sexual violence. HIV transmission may also be promoted by polygyny, extramarital sex, and sex between teenage girls and older men.

Economic hardships and an already high burden of infectious diseases account for a lack of access to medical care, resulting in untreated sexually transmitted diseases, unchecked mother-to-child HIV transmission, and a lack of treatment of AIDS-related illnesses.

Conclusion

The experience of the last several decades of the twentieth century suggests that health progress does not continue automatically. Certain combinations of epidemiological situations, socio-economic and socio-psychological conditions, and cultural and behavioral patterns can cause significant mortality reversals.

See also: *AIDS; Alcohol, Health Effects of; Mortality Decline.*

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MULTIPLE BIRTHS

Nearly one in every hundred deliveries is a twin birth. Triplet, quadruplet, and higher order deliveries occur far less frequently—only 1 in 10,000 deliveries. This article concerns only twins.

Twins are of two kinds: identical and fraternal. Biologists call the former monozygotic twins and the latter dizygotic twins, in reference to their different origins.

Identical (monozygotic) twins derive from a single fertilized egg, or zygote, that has divided in two in the course of its development. The two resulting embryos are genetically identical, which explains the close resemblance of monozygotic twins. They are always of the same sex.

Fraternal (dizygotic) twins derive from the ovulation and fertilization of two different ova during the same menstrual cycle. Each of these ova is fertilized by a spermatozoon and the twins resulting from these two eggs or zygotes are no more similar, from a genetic point of view, than ordinary brothers and sisters. Fraternal twins can be of the same sex or male and female, both variants occurring with equal frequency.

Fraternal and identical twins thus correspond to two distinct biological processes, and their incidence depends on different factors.

The Twinning Rate

The twinning rate is the proportion of twin deliveries in the total number of deliveries.