6. Looking ahead: the health of the world in 2020

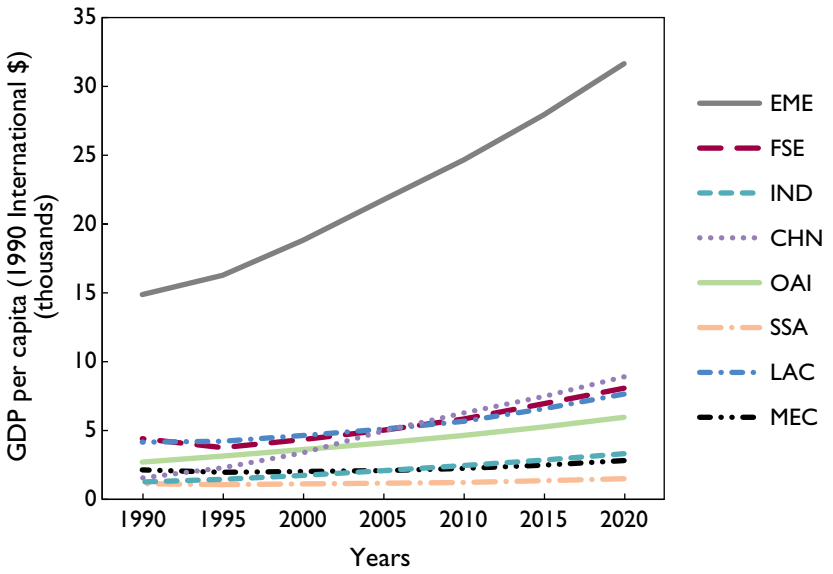
To plan health services effectively, policy-makers need to know how current health needs could develop in the future. For this study, the GBD developed projections of mortality and disability for each five year period from 1990 to 2020, by cause, for all regions and both sexes. The findings have striking implications for public policy.

6.1 How the projections were developed

The GBD researchers used a set of relatively simple models to develop projections of future health trends. Rather than attempt to model the effects of the many separate direct, or proximal, determinants of disease from the limited data that are available, it was decided to consider a limited number of socio-economic variables: (1) income per capita; (2) the average number of years of schooling in adults, termed "human capital"; and (3) time, a proxy measure for the secular improvement in health this century that results in part from accumulating knowledge and technological development. These socio-economic variables show clear historical relationships with mortality rates: for example, income growth is closely related to the improvement in life expectancy that many countries have

Figure 17 The rich get richer: baseline projections of income per capita by region, 1990-2020

Vol 1 p 340



6. This section summarizes Volume 1, Chapter 7, pp 325 to 395.

achieved this century. Because of their relationships with death rates, these socioeconomic variables may be regarded as indirect, or distal, determinants of health. In addition, a fourth variable, tobacco use, was included, because of its overwhelming impact on health status, using information from more than four decades of research on the time lag between persistent tobacco use—measured in terms of "smoking intensity"— and its effects on health.

Death rates for all major causes based on historical data for 47 countries since 1950–91 were related to these four variables to generate the projections. A separate model was used for HIV and modifications for the interaction between HIV and tuberculosis. Three projection scenarios were developed using different projections of the independent variables.

6.2 Results: patterns of death—and life—in the 21st century

Life Expectancy Grows Almost Everywhere, but Men Fare Worse

Life expectancy at birth is expected to grow for women in all regions. By 2020, infant girls born in the Established Market Economies may expect to survive to almost 88 years (Figure 18). For men, life expectancy will grow much more slowly, mainly because of the impact of the tobacco epidemic. Nevertheless by 2020, males born in Sub-Saharan Africa, whose life expectancy at birth was below 50 in 1990, may expect to reach 58 years. Males born in Latin America and the Caribbean, who in 1990 could have expected to live to 65, may expect to reach 71 years.

However, for men in the Formerly Socialist Economies of Europe, life expectancy is not expected to grow at all between 1990 and 2020. This is partly due to the fact that it has actually fallen between 1990 and 1995, so that any positive change is likely to be merely recovering to the 1990 position.

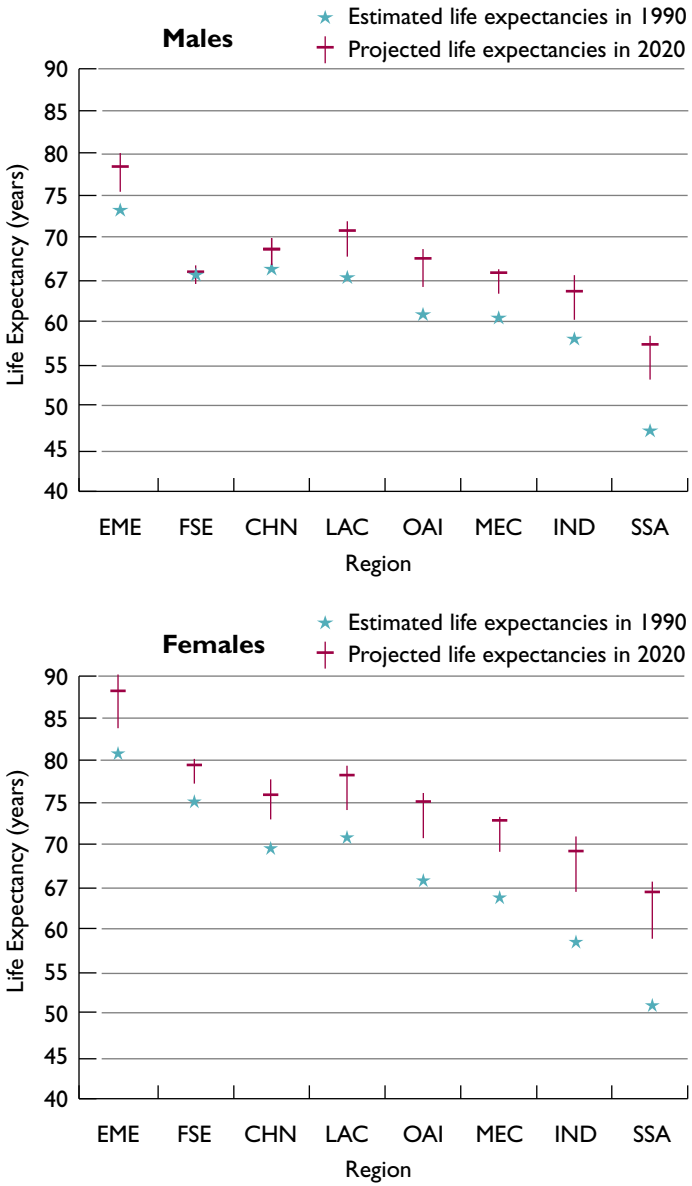
In young children and adolescents under the age of 15, the risk of death is projected to decline dramatically in all regions, falling by about two-thirds in Sub-Saharan Africa and India. In adult women, too, the risk of death is expected to fall in all regions. For men, the picture is more complex. Because of the tobacco epidemic, men in the Formerly Socialist Economies of Europe and China may expect a higher risk of dying between the ages of 15 and 60 than they do today. In other regions, the risk of death for men in this age group is expected to fall, but more modestly than in women. Remarkably, by 2020, men of this age group in the Formerly Socialist Economies of Europe could face a higher risk of death even than men in Sub-Saharan Africa.

The Impact of Infectious Disease May Be Reduced

Deaths from communicable, maternal and perinatal conditions and nutritional deficiencies (Group I) are expected to fall from 17.3 million in 1990 to 10.3 million in 2020. As a percentage of the total burden, Group I conditions are expected to drop by more than half, from 34 per cent to 15 per cent.

Figure 18 Projected life expectancy at birth in 2020, by region: baseline, optimistic and pessimistic scenarios, compared with 1990 estimates

Vol I p 354



Note: The stars in the figure denote life expectancies at birth in 1990. Baseline life expectancies projected for 2020 appear as a horizontal bar crossed by a vertical bar that gives upper and lower limits defined by the optimistic and pessimistic projection scenarios.

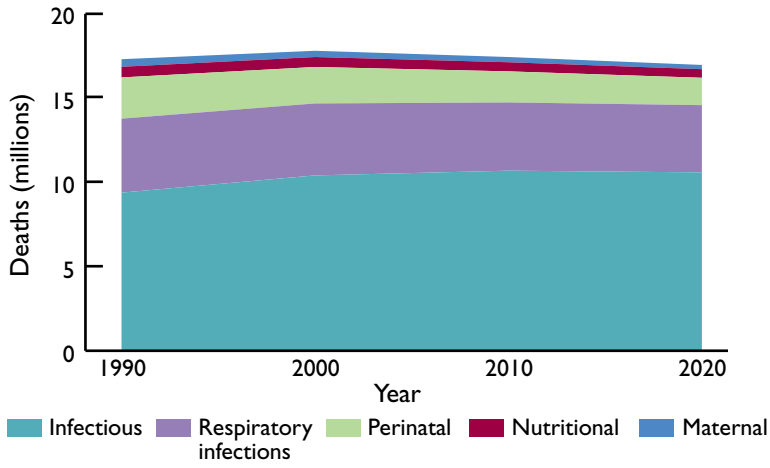
Even under the pessimistic scenario, deaths from infectious diseases, maternal and perinatal conditions and nutritional deficiencies are expected to fall slightly.

This projected reduction overall, despite increased burdens due to HIV and tuberculosis, runs counter to the now widely-accepted belief that infectious diseases are making a comeback worldwide. It reflects, in part, the *relative* contraction of the world's "young" population: the under-15 age group is expected to grow by only 22 per cent between 1990 and 2020, whereas the cohort of adults aged between 15 and 60 is expected to grow by more than 55 per cent. In addition, the projection reflects the observed overall decline in Group I conditions over the past four decades, due to increased income, education and technological progress in the development of antimicrobials and vaccines. Even under the pessimistic scenario, in which both income growth and technological progress are expected to be minimal, deaths from these conditions are still expected to fall slightly to 16.9 million (Figure 19).

Clearly, it should not be taken for granted that the progress of the past four decades against infectious diseases will be maintained. It is possible, for example, that antibiotic development and other control technologies

Figure 19 Pessimistic projection of deaths from Group I causes, world, 1990–2020

Vol 1 p 360



will not keep pace with the emergence of drug-resistant strains of important microbes such as *Mycobacterium tuberculosis*. If such a frightening scenario were to prove correct, and if, in addition, case-fatality rates were to rise because of such drug-resistant strains, the gains of the present century could be halted or even reversed. Undoubtedly, the continuing high toll of Group I causes today leaves no room for complacency. Nonetheless, the evidence to date suggests that, as long as, and only if, current efforts are maintained, Group I causes are likely to continue to decline.

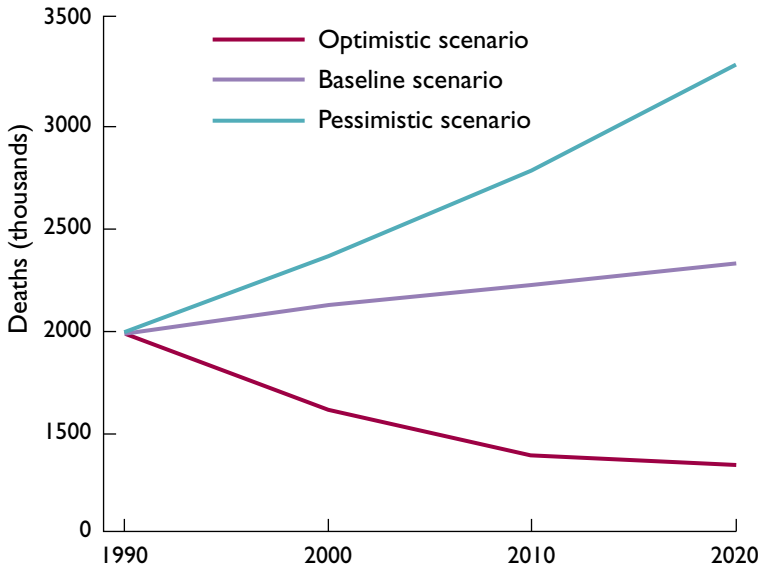
HIV and Tuberculosis

Projections for HIV mortality were developed using a separate model. The GBD projections for HIV demonstrate that the death toll from the AIDS epidemic may be even greater than feared in future.

In Sub-Saharan Africa, death rates from HIV/AIDS are expected to peak around 2005 with around 800 000 deaths per year. In India, death rates are expected to peak a little later, around 2010, at about half a million a year. The worldwide peak for HIV deaths is expected to be around 2006, with perhaps 1.7 million deaths that year. Clearly, these estimates are subject to considerable uncertainty.

Projections of the future impact of tuberculosis are also subject to large uncertainties, but the results are no more reassuring than those for AIDS. The figure shows baseline, optimistic and pessimistic projections of the deaths the disease is expected to cause between 1990 and 2020 (Figure 20).

Figure 20 Projections of deaths from tuberculosis, world, 1990–2020



The Rise of Noncommunicable Diseases

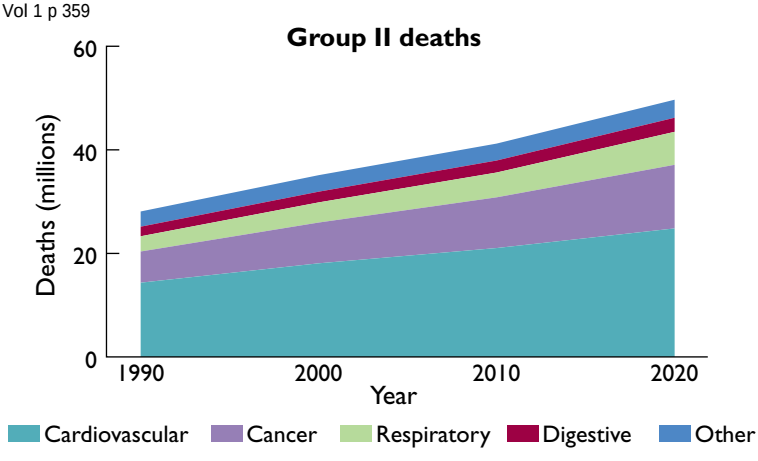
While overall, Group I conditions are expected to decline, deaths from noncommunicable diseases (Group II) are expected to climb from 28.1 million deaths in 1990 to 49.7 million in 2020, an increase of 77 per cent in absolute numbers. In proportionate terms, Group II deaths are expected to increase their share of the total from 55 per cent in 990 to 73 per cent in 2020. These global figures, impressive as they are, mask the extreme nature of the change that is projected in some developing regions because they incorporate the projections for the rich nations, which show little change. In India, deaths from noncommunicable diseases are projected to almost double, from about 4 million to about 8 million a year, while Group I deaths are expected to fall from almost 5 million to below 3 million a year. In the developing world as a whole, deaths from noncommunicable diseases are expected to rise from 47 per cent of the burden to almost 70 per cent.

The steep projected increase in the burden of noncommunicable diseases worldwide is largely driven by population aging, augmented by the large numbers of people in developing regions who are now exposed to tobacco. It is important to stress that aging will result in a rise in the absolute numbers of cases of noncommunicable diseases and in their increased share of the total disease burden for the population as a whole, but not in any change to the rates of those diseases *in any given age group*.

As studies in the Established Market Economies show, the age-specific rates of some important noncommunicable diseases, such as ischaemic heart disease and stroke, have been falling steadily for at least two decades. Whether these rates are also falling in other regions is much less clear.

Figure 21 The rise of noncommunicable diseases: Group II deaths by causes, world, 1990–2020

Vol 1 p 359



However, any age-specific decrease in the rates of these diseases that may also emerge in low-income countries is likely to be outweighed by the large and demographically driven increase in the *absolute numbers* of adults at risk for these diseases, augmented by the tobacco epidemic.

As with noncommunicable diseases, deaths from injury are also expected to rise for mainly demographic reasons. Young adults are generally exposed to greater risks of injury.

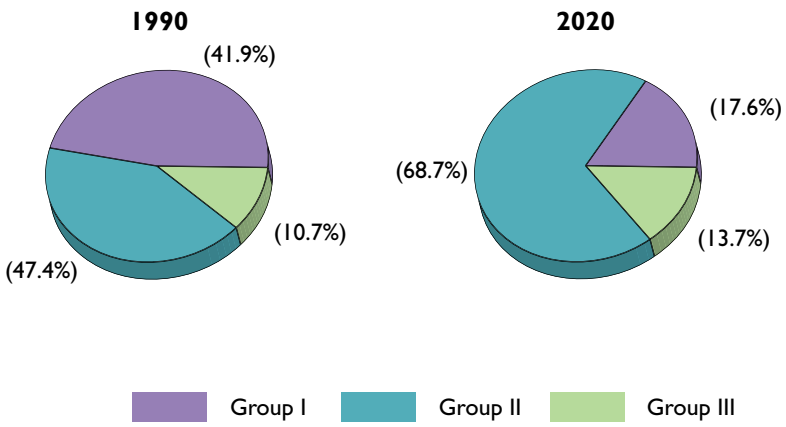
6.2 The burden of disease in 2020

When disability is taken into account as well as death, a different view of the future emerges — and one that emphasizes adult health problems still further. By 2020, the disease burden due to communicable, maternal and perinatal conditions and nutritional deficiencies (Group I) is expected to fall to a fifth of the total. The burden attributable to Group II, accordingly, is expected to rise sharply, and the burden from injuries is also expected to rise to that of Group I conditions (Figure 22).

Mental Health: Unmet and Growing Needs

As with the 1990 assessments, psychiatric diseases emerge as a highly significant component of global disease burden when disability, as well as death, is taken into account. The projections show that psychiatric and neurological conditions could increase their share of the total global burden by almost half, from 10.5 per cent of the total burden to almost 15 per cent in 2020. This is a bigger proportionate increase than that for cardiovascular diseases.

Figure 22 Change in the distribution of DALYS, by broad cause Group, developing regions, 1990–2020.



Tobacco's Legacy

By 2020, the burden of disease attributable to tobacco is expected to outweigh that caused by any single disease. From its 1990 level of 2.6 per cent of all disease burden worldwide, tobacco is expected to increase its share to just under 9 per cent of the total burden in 2020, compared with just under 6 per cent for ischaemic heart disease, the leading projected disease. This is a global health emergency that many governments have yet to confront.

Leading Causes of Disease Burden in 2020

Figure 2 on page 8 shows how the global pattern of disease burden is expected to shift over the next 24 years. In 1990, the three leading causes of disease burden were, in descending order, pneumonia, diarrhoeal diseases and perinatal conditions. The three conditions projected to take their place by 2020 are ischaemic heart disease, depression and road traffic accidents. Pneumonia is expected to fall to sixth place, diarrhoeal diseases to ninth and perinatal conditions to eleventh. Notably, measles, currently in eighth place, is expected to drop to twenty-fifth. However, not all infectious diseases are expected to decline, despite the projected overall collapse of Group I conditions. Tuberculosis is expected to remain at its current level of seventh place, a substantial source of disease burden for the foreseeable future. Of equally great concern is the finding that HIV, currently twenty-eighth in the ranking, could be as high as tenth by 2020.

Road Traffic Accidents and Violence

Because of the growth of the adult fraction of the population, the burdens of several important types of injury are also likely to increase. For example, young men are the group most frequently involved in road traffic accidents, so if the young-adult proportion of the population increases sharply, road traffic accidents are likely to increase too. Indeed, according to the baseline projection, road traffic accidents could rise to third place from ninth worldwide. Violence, currently nineteenth, could rise as high as twelfth place and suicide could climb from seventeenth to fourteenth place.

Not surprisingly, these changes are not expected to be evenly dispersed worldwide. The total number of lost years of healthy life in the Established Market Economies is likely to fall slightly, while it will increase slightly in the Formerly Socialist Economies of Europe. Strikingly, however, Sub-Saharan Africa's future looks disturbingly poor *despite* the decline in the burden of Group I conditions that currently dominate its health needs. Overall, the region faces an increase in the number of lost years of healthy life between 1990 and 2020, due mainly to a steep projected rise in the burden of injuries from road accidents, war and violence.

Conclusion

The GBD study has provided a new and much needed picture of current and projected health needs. In particular, it has shown that noncommunicable diseases are rapidly becoming the dominant causes of ill-health in all developing regions except Sub-Saharan Africa; it has revealed the extent to which mental health problems have been underestimated worldwide; and it has shown the significance of injuries as a problem for the health sector in all regions. The findings pose new and immediate challenges to policy-makers and are certain to provoke debate. Ultimately, the study's impact will be judged in two ways: first, by the degree to which it stimulates other researchers to apply the same rigorous methods of measuring disease burden in all regions; and second, to the extent that it changes priorities for public health in the decades ahead.