



Human Longevity.

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throughout the Report, but an opportunity was missed to establish firmer and higher ground for the dialogue between health ministries and ministries of economic development. Only with a more explicit treatment of this issue would we be able to appreciate the basis for the Report's recommendation that the share of development aid targeted for health be raised to 7 percent.

Despite its skirting of this issue, the Report is a most valuable contribution to international and national discussions of health policy. It is authoritative, comprehensive, and written with grace and lucidity. The Bank has become the largest single source of external funds for health. With this Report and related research activities, it has also clearly established itself as the leading source of information and advice about health policy.

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DAVID W. E. SMITH

Human Longevity

New York: Oxford University Press, 1993. ix + 175 p. \$35.00.

David W. E. Smith offers us a sweeping and unusually lucid review on the subject of human longevity. The work provides an impressively detailed discussion of the current state of knowledge about this important topic, drawing simultaneously and judiciously from the fields of biology, medicine, demography, epidemiology, and gerontology. Each chapter is intended as a review of one subject area: human mortality (chapter 1), causes of death (2), the biology of aging (3), socioeconomic and sex differentials in mortality (4, 5), and the evolution and future of longevity (6, 7).

The task of writing a book on such a broad topic, summarizing research from various disciplines, and aiming the discussion at diverse audiences presents formidable challenges. An author must employ a terminology that is comprehensible to readers who may not be keenly familiar with the research of a particular discipline. In addition to breadth of coverage, he must offer depth as well, and he must maintain similar levels of detail and sophistication for the different subjects being reviewed. In all these matters, Smith's book is exemplary. As a demographer, I might have expected to learn nothing new from the chapter on mortality, but the discussion about the longevity of premodern humans, for example, was informative nonetheless. The book describes the major causes of death in humans from both demographic and biomedical perspectives, and it offers a needed reminder to demographers of the clinical ambiguities involved in assigning an underlying cause of death, especially among very elderly people. In spite of this generally favorable reaction, however, the book is not beyond criticism.

Some of the most interesting and authoritative material is in the chapter on male-female differences in human mortality (that impression is perhaps unsurprising given the author's research record on the topic, which includes all three bibliographic citations listed under his name). Nevertheless, the discussion of the demo-

graphic evidence on this topic seems incomplete. Excess male mortality in the United States is greatest in the age range 15–40 years (the male–female ratio of age-specific death rates is above 2 in this range but below 2 elsewhere). Smith presents sex differences by cause of death, but unfortunately he does not discuss the interaction between age and cause. The male–female ratio of age-adjusted total mortality rates is greatest for suicide, homicide, motor vehicle accidents, and lung cancer. Two of these causes (homicide and motor vehicle accidents) are concentrated in the age range 15–40; therefore, they probably explain a significant portion of the sex difference in mortality rates at those ages and, ultimately, in life expectancy at birth.

Smith's discussion of the sex differential in human mortality emphasizes differences in male and female biology. Certainly, biology is important in explaining, for example, the large gap in death rates due to cardiovascular disease (although in this case, as with accidents and suicide, there is an important behavioral component as well). The causes of death and the interrelated age profile that contribute to the male–female gap in life expectancy also draw attention to the important role of social and behavioral aspects of this difference, and this fact could have received more emphasis.

The nature–nurture debate regarding sex differentials in life expectancy is a relatively minor point, however. My major criticism of this book relates to its use of the term “maximum species life span.” The problem with such a concept is that it can have no fixed value. It is implausible to suggest, for instance, that an individual of a given species could survive n years but not n years and one day. At the beginning of the book, Smith defines this concept in terms of the maximum value ever observed, on the stipulation that reliable records of age at death are available for large numbers of individuals living under “favorable conditions.” If “favorable conditions” are taken to be synonymous with “optimum conditions,” then by definition the maximum life span for a species can be determined only when such conditions have been achieved (and even then, the observed maximum will depend on the size of the population being observed). Smith seems to employ a more fluid definition of “favorable,” however, and speculates in his concluding chapters about the possibility of future increases in the maximum human life span. So, by definition apparently, the maximum human life span (currently 120 years according to the *Guinness Book of World Records*) is not necessarily a fixed constant influencing trends in human mortality and survivorship.

How, then, is it possible for Smith to assert in his chapter on the evolution of human longevity that “each species has an absolute limit to its longevity” and that “the maximum life span is genetically determined”? Has maximum life span now become a fixed constant, an absolute limit derived from evolution and changing only as slowly as evolution permits (excepting the possibility of more rapid manipulation through genetic engineering)? It would seem pointless to deny that the maximum human life span, no matter how defined, is heavily influenced by genetics. At the same time, the phrase “genetically determined” seems to be a particularly unfortunate exaggeration of the current scientific understanding of this topic. Empirically, it is now well documented that the observed maximum age at death has been increasing steadily for at least the past 130 years in countries for which very accurate vital records are available, and this trend has shown no sign of leveling off in recent years. An emphasis on genetic determinism may perpetuate the

already widespread belief that the rise in human life expectancy is constrained by a fixed biological limit on the maximum age attainable by humans, which is thus far a mere conjecture, not a proven scientific fact. Given the difficulties inherent in defining the notion of "maximum life span," any scientifically valid discussion of the biological limits affecting human mortality should be based on age-specific mortality rates, probabilities of survival to advanced ages, or some other well-defined quantity.

Overall, this book is informative reading for anyone interested in the topic of human longevity. It provides a well-written review of the existing state of knowledge in the field, with relatively few errors or obvious flaws as noted by this reader. It does not contain original theoretical arguments or data that have not been published elsewhere, but that is not its purpose. For a demographer interested in the future of human mortality, its conclusions are unstartling and uncontroversial: human life expectancy should continue to increase slowly over the next century, and the maximum life span (whatever that means) may go up as well. The book does not provide strong evidence for doing something other than what demographers already do best—projecting past trends into the future; but it may make our projections a little more insightful, it will definitely teach us something about the biomedical aspects of longevity, and it could stimulate a variety of interesting research questions.

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DAVID R. PHILLIPS (ED.)

Ageing in East and South-East Asia

London: Edward Arnold, 1992. xii + 252 p. \$59.95.

By now most demographers must be aware that the population of Asia is aging, in some regions (notably East Asia) very rapidly. There is no shortage of documentation of this trend, thanks to the reality-instilling tool of demographic projection. The demographic explanation for the aging of Asia is twofold: in most countries in the region fertility has declined since the early 1960s (the chief cause), and throughout the region adult mortality has also declined. Where fertility declined precipitously (Japan, China, Thailand), the population is likely to age at a much faster rate than has been the case in Europe and North America. Adding to the demographic analysis of the aging of Asia is not the chief aim of this book. Rather, it considers nondemographic consequences of population aging in East and South-East Asia. These consequences fall into two general classes: impacts on the economy; and impacts on care for the elderly. The latter class of impacts is the focus of this book.

Care for the elderly is defined broadly (the editor, David Phillips, prefers the term "social care") to include income support, health care, living arrangements, assistance with daily activities, recreation, and social activities. Two introductory chapters (one by Phillips, the other by Gary Andrews) describe the concerns motivating the volume, identify methodological problems that encumber empirical re-