



POLICY FORUM: GLOBAL POPULATION GROWTH

# Demographic Consequences of Declining Fertility

John Bongaarts

A revolution in reproductive behavior has swept the globe since the 1960s. In the developing countries of Asia, Africa, and Latin America, contraceptive use, once rare, is now widespread and the average number of births per woman has fallen by half, from the traditional six or more to closer to three today. In the industrialized world, fertility has already dropped below two children per woman. This unprecedented development has led the United Nations (UN) to revise downward its latest forecast of world population. As a result, some fear a "population implosion" or claim that the world population explosion is over (1).

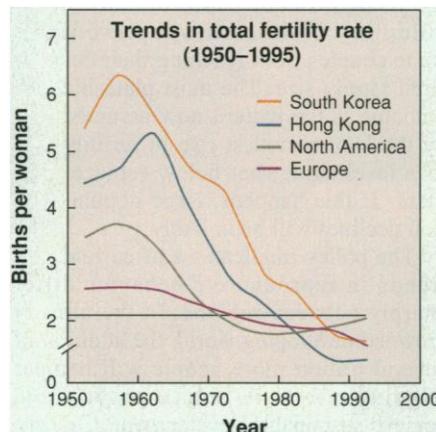
However, instead of being near the end of an explosion at today's population of 5.9 billion, we are in fact just past its midpoint, according to the newly revised UN projection (2). After a record-breaking increase of 2 billion people over the past 25 years, an increase of another 2 billion is projected to occur over the next 25 years and a further expansion to 10.4 billion is expected by 2100. Nearly all of this growth will occur in the developing countries, in which four-fifths of the world's population lives. Despite the plummeting fertility rates, large increases in the populations of Africa, Asia, and Latin America are expected.

These population increases are expected for three reasons. First, the average decline from six to three births per woman (bpw) still leaves fertility about 50% above the two-child rate needed to bring about population stabilization. With more than two surviving children per woman, every generation is larger than the preceding one, and as long as that is the case, population expansion continues.

Second, declines in mortality—historically the main cause of population growth—will almost certainly continue. Higher standards of living, better nutrition, expanded health services, and greater investments in public health measures have increased life expectancy by 50% since 1950, and a further rise is likely. The unhappy exceptions will be mostly in sub-

Saharan African countries with severe AIDS epidemics. As more people live longer, there will be more people alive.

The final and most important factor is what demographers call "population momentum." This term refers to the tendency of a population to keep growing even if fertility could immediately be brought to the replacement level of 2.1 bpw, with constant mortality and zero migration. The reason for this growth is a young population age structure, which includes the historically largest generation of women about to enter the childbearing years. These women will produce more than enough births to maintain population



growth for decades, even if they each have only two children. Further large increases in the population of the developing world are therefore virtually certain.

Europe, North America, and Japan face a quite different demographic future. In these countries, the key concerns are aging and potential population decline, because measured fertility has remained below the replacement level since the mid-1970s. Although populations in most developed countries are still growing today because of population momentum, rising life expectancy, or immigration, reductions in population numbers are likely if fertility remains below replacement levels. The UN expects this decline to begin in Europe in 2000 and in Japan in 2005, whereas the populations of the United States, Australia, and New Zealand are expected to grow until at least 2050. For the developed world as a whole,

population size is projected to rise slowly until 2025 and then decline, leaving the total in 2050 about the same as today. The proportion of the population over age 65 is expected to rise to 25% in 2050, up from 14% today. This trend will make it increasingly difficult for pay-as-you-go social security systems to meet their obligations to retirees.

All UN projections are based on assumptions about future trends in fertility, mortality, and migration. The most crucial of these assumptions is that over the next few decades, fertility will move (up or down) in both developed and developing countries to the replacement level of 2.1 bpw and will remain at that level after 2050. This simple assumption ensures zero population growth in the long run. Unfortunately, future population trajectories are highly sensitive to small deviations from replacement. For example, if future fertility were to level off just half a birth above replacement, world population in 2100 would reach 17.5 billion instead of 10.4 billion; conversely, fertility at half a birth below replacement would lead to population decline in the second half of the next century to 5.6 billion in 2100 (3). This sensitivity increases the uncertainty of long-range projections, but it is good news for policy-makers: Even modest efforts to change fertility can have a substantial impact on future population size.

The UN's replacement assumption has become increasingly controversial, however, because fertility has dropped below 2.1 bpw (sometimes by a substantial margin) in virtually every industrialized country. Europe's fertility now stands at 1.5 bpw. Similarly, rapidly developing southeast Asian countries have experienced steep declines in birth rates since 1960, leaving fertility today at 1.7 in South Korea and at 1.3 in Hong Kong (see figure at left). A review of this evidence led an Expert Group Meeting, convened by the UN in November 1997, to accept a proposal that the UN abandon the replacement assumption, at least for countries that are now below replacement (4). This change, which will be implemented in the forthcoming 1998 projections, should lead to a downward revision of projections in a number of countries. The effects on future world population totals are likely to be fairly small, because the adjustments are modest and they do not apply to the large majority of developing countries.

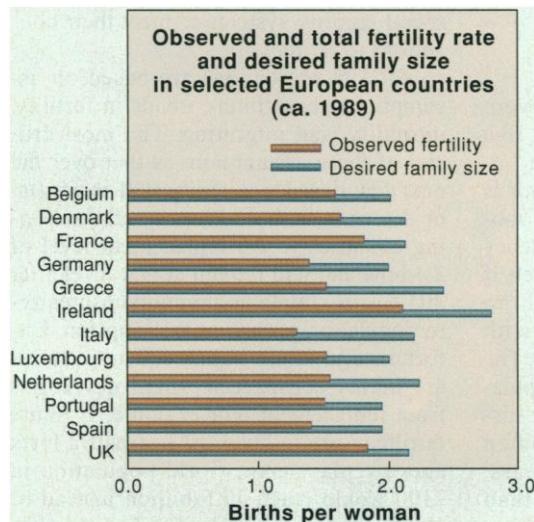
These adjustments are clearly warranted, but the issue may remain controversial, because in many cases the new future fertility assumptions exceed the current level of fertility. This implies that

SOURCE: ADAPTED FROM (2)

The author is in the Policy Research Division, The Population Council, New York, NY 10017, USA. E-mail: Jbongaarts@PopCouncil.org

## SCIENCE'S COMPASS

fertility is assumed to rise between 2000 and 2050 in many industrialized countries. The UN does not provide a detailed justification for this projected fertility trajectory, but there are good reasons to believe that it is reasonable. A key factor



putting upward pressure on fertility is that the average desired family size is close to two children, according to surveys in Europe and the United States (typically, couples want one boy and one girl). This finding implies a puzzling discrepancy between expressed preferences and the observed rate of childbearing. This difference in a number of European countries is around 0.5 births per woman (see figure above). It is of course possible that fertility preferences will decline in the future, but they have changed little since the 1970s and they could well remain close to current levels.

Why do fertility preferences exceed measured fertility in most low-fertility societies today? One of the most important causes of this discrepancy is the fact that the most widely reported measure of annual fertility (the so-called total fertility rate) often does not accurately reflect the actual childbearing experiences of women. For example, in France, women who have reached the end of their childbearing years report having 2.1 births on average, which is close to their preferred number, but the annual total fertility rate has been well below replacement since the mid-1970s (5). Similar discrepancies exist in many other developed countries. The downward distortion in the total fertility rate is caused by women's decisions to postpone childbearing, which has led to a rise of several years in the mean age at childbearing since 1970. These delays are temporarily contributing to today's baby bust, just as younger childbearing ages in the 1950s temporarily contributed to a baby boom.

These distortions can reach as high as 0.4 births per woman, but they are temporary because they exist only while the age at childbearing is rising (6). Once women stop deferring births, the distortion disappears and the very low fertility rates observed in the developed world should rise closer to the two children most couples want. This has already happened in the United States, where fertility rose from 1.77 to 2.08 births per woman between 1975 and 1990 as birth deferment stopped. It is therefore plausible to assume that fertility in Europe will not decline further and might even turn upward soon. However, it is unlikely that fertility will rise all the way to the replacement level even in countries where couples continue to want two children, because various constraints (such as divorce, the desire to remain employed,

the rising costs of children, and involuntary childlessness) prevent some couples from reaching their desired family size. The most plausible outcome is the pattern now assumed by the UN: a modest rise in fertility to a level somewhat below replacement. If this happens, large population declines will be unlikely.

The policy implications of current trends in reproductive behavior differ sharply between regions. In the already crowded developing world, the addition of several billion more people will hamper ongoing efforts to reduce poverty and achieve sustainable development. Concern over these adverse consequences has provided the principal rationale for past investments in voluntary family planning and reproductive health programs that help couples avoid unwanted childbearing. This vital effort should be strengthened and expanded to include social investments in young people. For example, raising education levels of girls reduces fertility and offsets momentum by delaying the onset of childbearing, in addition to having many direct benefits for the quality of individual lives (7).

In the developed world, the potential adverse consequences of prolonged below-replacement fertility have led to extensive discussions but little action. Numerous policy options have been proposed to encourage childbearing: free or subsidized childcare, reduced taxes for families with children, paid parental leaves, subsidized housing for young couples, and so on (8). There is unfortunately

little useful experience to draw on in assessing the potential effectiveness of various options. In the rare instances where new measures to raise fertility were successfully implemented (such as in Sweden in the late 1980s), it is difficult to disentangle the roles of the specific components in a package of measures. The reluctance of most governments to pursue explicit pronatalist policies is due to a range of factors. These include the awkwardness of promoting domestic pronatalism while subsidizing fertility reduction in the developing world and a reluctance on the part of governments to interfere in the personal matter of reproductive choice. In addition, implementation

POPULATION ESTIMATES (1995) AND PROJECTIONS TO 2050 BY REGION  
Population (billions)

	1995	2025	2050
Africa	0.72	1.45	2.05
Asia*	3.47	4.82	5.49
Latin America	0.48	0.69	0.81
Europe	0.73	0.70	0.64
North America	0.30	0.37	0.38
Developing world	4.52	6.82	8.20
Developed world	1.17	1.22	1.16
World	5.69	8.04	9.37

\*includes Oceania

of effective intervention is expensive, and there is a lack of a feeling of urgency about the problem, especially considering the benefits to the global environment of fewer rich consumers of natural resources. It is quite possible, however, that the population declines expected to become more widespread after 2000 in the developed world will lead to greater concern about their negative consequences and hence to more vigorous action.

### References and Notes

1. N. Eberstadt, *The Public Interest* 129, 3 (1997); B. Wattenberg, "The population explosion is over" *New York Times*, 23 November 1997, p. 61.
2. UN, *World Population Prospects, The 1996 Revision* (UN, New York, 1997).
3. UN, *World Population Projections to 2150* (UN, New York, 1998).
4. UN Population Division, in *Proceedings of Expert Group Meeting on Below Replacement Fertility* (Population Division, UN, 1997, ESA/P/WP.140).
5. Council of Europe, *Recent Demographic Developments in Europe* (Council of Europe Publishing, Strasbourg, France, 1996).
6. J. Bongaarts and G. Feeney, *Pop. Dev. Rev.* 24, 2 (1998).
7. J. Bongaarts, *Science* 263, 771 (1994).
8. P. Demeny, in *Proceedings of Expert Group Meeting on Below Replacement Fertility* (Population Division, UN, 1997, ESA/P/WP.140).
9. D. Coleman, in *Europe's Population in the 1990s* (Oxford Univ. Press, 1996).

SOURCE FOR FIGURE: ADAPTED FROM (9). SOURCE FOR TABLE: ADAPTED FROM (2)