SIX BILLION AND COUNTING: GLOBAL POPULATION TRENDS AT THE TURN OF THE CENTURY

Graeme Hugo

The 1998 United Nations population projections for the world show that we may be set to add nearly five billion extra people by 2050, but growth rates have fallen. This is largely because of dramatic falls in fertility, particularly in Asia. The projections are, however, very sensitive to small changes in fertility.

Almost all of the projected growth will take place in the less developed countries and, as fertility falls, it is inevitable that the average age of the world's population will rise.

The United Nations estimates that on the 12th of October 1999 the world's population will reach six billion. This major event draws attention to the fact that rapid growth of the world's population is a relatively recent event. See Table 1. However, it is important to note that the rate of this growth is slowing down.

The annual growth rate for the world's population for 1998-2000 is 1.33 per cent per annum, compared with a peak of 2.04 per cent between 1965 and 1970. Indeed, the United Nations Population Division had previously earmarked 16 June 1999 as the six billion day but the latest revision of their projections indicated that they needed to put the date back several months.

This paper seeks to summarise the findings of the latest biennial revision of world population projections made by the United Nations Population Division in 1998.[1] It is worth noting that these projections are not intended as forecasts. Rather, they indicate the population outcomes of a number of well defined and plausible (but hypothetical) scenarios of demographic change. The projections are prepared for five main fertility assumptions (medium, high, high/medium, low/medium and low) as well as two illustrative (but unrealistic) scenarios, one of instant achievement of replacement fertility (which shows 'the momentum' of population growth) and one of keeping current levels of fertility constant.

All seven sets of projections have the same overall mortality assumptions although these are different for the eight major regions of the world. For each region life expectancy is assumed to improve and the eight values tend to converge toward a nearly identical value. In the 1992 projections this value had been an expectation of life at birth of 85 years but in the 1998 projections this has been increased to 90 years (87.5 for men and 92.5 for women). For the projections of major areas of the world, international migration assumptions are included. These were the same as the revised assumptions developed for the 1996 projections.[2] Both projections assume no net migration after 2025.

Table 1: World population growth

World population reached	It is expected to reach
1 billion in 1804	
2 billion in 1927 (123 years later)	6 billion in 1999 (12 years later)
3 billion in 1960 (33 years later)	7 billion in 2013 (14 years later)
4 billion in 1974 (14 years later)	8 billion in 2028 (15 years later)
5 billion in 1987 (13 years later)	

Source: *Populi,* December 1998, p. 3

A DECLINE IN THE MOMENTUM OF POPULATION GROWTH

The most striking feature of the 1998 projections is the decline in the momentum of global population growth. Table 1 shows that the length of time taken to add an extra billion to the world's population telescoped with each extra billion up until the four billion mark, but that this dramatic trend then eased. The intervals between the fourth and fifth billion and the fifth and sixth were only one year shorter than the intervals which immediately preceded them. Indeed, it is projected that the seventh and eighth billions will take slightly longer to add than the fifth and sixth.

Another way of looking at this pattern of slower growth is to compare the United Nations projections prepared in 1990 on the basis of then current trends with those prepared in 1996 and 1998. (See Table 2.) In 1990 the UN projection for the world's population in 2025 (medium variant) was 8.504 billion, a figure 5.8 per cent higher than the projection (medium variant) for the 1998 series (8.039 billion). This points to the massive and sustained falls in fertility which have occurred, especially over the last two decades. The effect of these falls in reducing population growth rates has been counterbalanced to some degree by improved life expectancy but they are still clearly evident in the new projections.

The fall in global fertility levels has been striking. The changes in Indonesia are set out in Figure 1. These give an indication of the extent to which fertility has declined in Asian countries. Figure 1 shows that the total fertility rate (TFR)[3] in Indonesia has more than halved over the last quarter century. Globally fertility has continued to fall and the number of countries with declining or low fertility has increased. Caldwell points out that 44 per cent of the world's population now lives in countries with below replacement fertility.[4] Asian fertility has been declining for two decades but, more recently, fertility has also started to decline in parts of Sub-Saharan Africa. The fertility assumptions used in the 1998 projections range from the global TFR declining by the year 2050 to a high of 2.5, or a medium of 2.0, or a low of 1.6. The medium fertility scenario is the one which is seen as being most indicative of likely future patterns and this scenario assumes that the global TFR will ultimately stabilise by the year 2055 at replacement levels (2.1).

RESULTS OF THE 1998 UNITED NATIONS PROJECTIONS

Growth and distribution

The results of the 1998 projections based on the seven different fertility scenarios are presented in Table 3 and Figure 2. Although the usual practice is to adopt the medium fertility scenario as the most

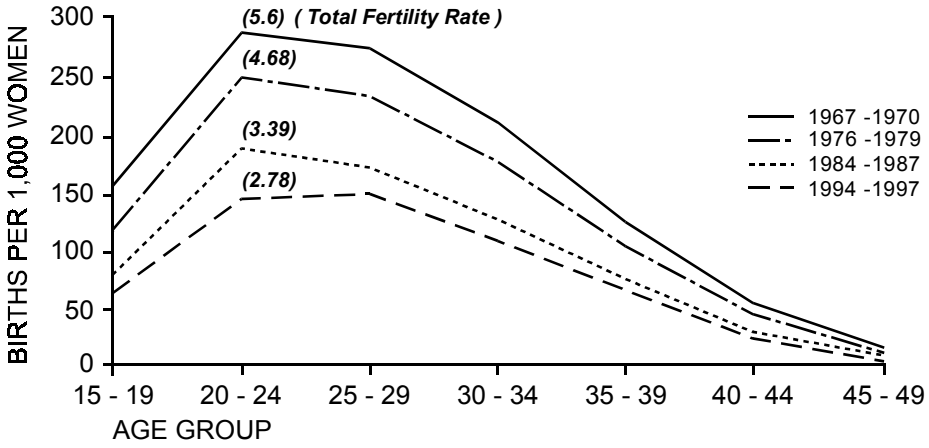
Table 2: The world's population in 2025 as projected in: 1990, 1996 and 1998, medium variants

Region	1990	1996	1998
World	8,504	8,309	8,039
More developed regions	1,354	1,319	–
Less developed regions	7,150	6,721	–
Europe	515	502	701*
North America	332	369	369
Former USSR	352	297	–
Oceania	38	41	41
Africa	1,597	1,454	1,454
Latin America/Caribbean	757	690	690
Asia	4,912	4,686	4,784*

Source: United Nations Population Division, *World Population Projections to 2150*, United Nations, New York, 1998

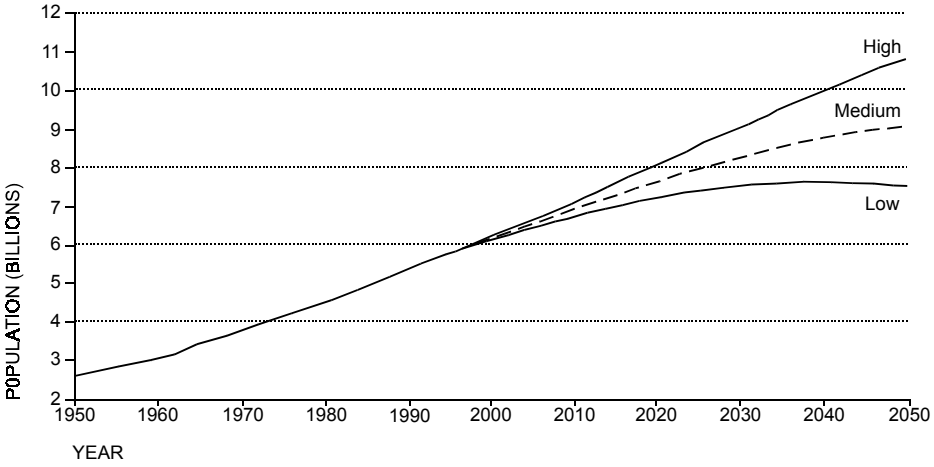
* Includes part of the former USSR.

Figure 1: Indonesia: age-specific fertility rates (and TFR), 1967-1997



Sources: Central Bureau of Statistics (Indonesia); State Ministry of Population/National Family Planning Coordinating Board and Ministry of Health; Macro International Inc. 1998, *Indonesia Demographic and Health Survey 1997*, Calverton, Maryland, USA

Figure 2: World population size: past estimates and medium, high and low fertility variants, from 1950 to 2050, 1998 projections



Source: United Nations Population Division, *World Population Prospects: The 1998 Revision*, United Nations, New York, 1999

Table 3: World population projections based on seven fertility scenarios, 1950-2150 (in billions), 1998 projections

Year	Fertility Scenarios						
	Medium	High	High/ Medium	Low/ Medium	Low	Constant	Instant Replacement
1950	2.5	2.5	2.5	2.5	2.5	2.5	2.5
1995	5.7	5.7	5.7	5.7	5.7	5.7	5.7
2050	9.4	11.2	10.8	8.0	7.7	14.9	8.4
2100	10.4	17.5	14.6	7.2	5.6	57.2	9.0
2150	10.8	27.0	18.3	6.4	3.6	296.3	9.5

Source: *Population and Development Review*, vol. 24, no. 1, 1998, p. 186

likely outcome, it is clear that the various fertility assumptions result in a wide range of possible outcomes by 2150. The huge variations indicate the sensitivity of the projections to shifts in fertility and the critical importance of government action relating to fertility in shaping the world's future population.

If we concentrate on the medium variant, the projections illustrate two main trends: the world's population is projected to grow, albeit it an ever decreasing rate, and the geographical distribution of the world's people is projected to change.

The medium fertility scenario sees the population growing from six billion at present to 9.4 billion in 2050, 10.4 billion in 2100 and 10.8 billion in 2150 and suggests that it will stabilise at slightly under 11 billion persons around 2200. The annual population increment declined from its peak of 86 million people in 1985-90 to 78 million at present and, under this scenario, is projected to decline to 64 million between 2015 and 2020 and then drop sharply to 30 million per year between 2045 and 2050. The annual rate of population growth will also decline from its present level of 1.33 per cent to 0.34 per cent in 2045-2050.

Although the high and low fertility scenarios differ by just under one child per couple (high, TFR of 2.5; low, TFR of 1.6), around half a child above and half a child below the replacement level of 2.1, the effect on the projections for 2150 is dramatic. The low TFR would produce a population of 3.6 billion persons; the high TFR one of 27 billion!

The medium variant also projects a continued geographical shift in the distribution of the global population away from the more developed areas. These

Table 4: Population of the major regions of the world, 1950, 1998 and 2050 (in millions), medium variant, 1998 projections

	Number			Per cent		
	1950	1998	2050	1950	1998	2050
World	2,521	5,901	8,909	100	100	100
More developed regions	813	1,182	1,155	32.2	20.0	13.0
Less developed regions	1,709	4,719	7,754	67.8	80.0	87.0
Africa	221	749	1,766	8.8	12.7	19.8
Asia	1,402	3,585	5,268	55.6	60.8	59.1
Europe	547	729	628	21.7	12.4	7.0
Latin America and the Caribbean	167	504	809	6.6	8.5	9.1
North America	172	305	392	6.8	5.2	4.4
Oceania	13	30	46	0.5	0.4	0.6

Source: *Population and Development Review*, vol. 24, no. 4, 1998, p. 894

areas had 20 per cent of the population in 1998 but are projected to have only 10 per cent in 2150. Table 4 shows that Africa's share of the global population increased from 8.8 to 12.7 per cent between 1950 and 1998 and that it will account for one fifth of the world's population by 2050. Asia will still dominate the global population but, as the low fertility common in the region takes effect, its share will decline marginally.

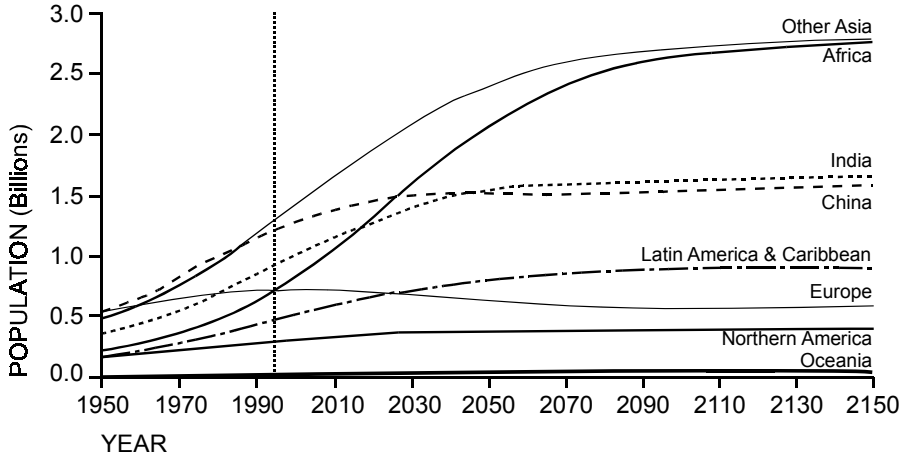
The proportion of the world's population living in Europe fell from more than a fifth in 1950 to 12.4 per cent in 1998. Under the medium variant Europe's share will continue to drop, falling to seven per cent in 2050.

Ninety-seven per cent of the world's increase will take place in the less developed countries. Every year the population of Asia grows by 50 million and that of Africa by 17 million. Currently, sixty per cent of global population increase is contributed by 10 countries (India, China, Pakistan, Indonesia, Nigeria, USA, Brazil, Bangladesh, Mexico and the Philippines). Two out of five of the world's citizens live in China (1.256 billion people) or India (982 million) and there are eight other nations with more than 100 million residents (the USA, Indonesia, Brazil, Pakistan, Russian Federation, Japan, Bangladesh, Nigeria). By 2050 eight additional countries will be added to this list (Ethiopia, Democratic Republic of the Congo, Mexico, Philippines, Viet Nam, Iran, Egypt and Turkey). But by 2045-50 some 56 countries will be experiencing a decline in population numbers. The projected changing population size of the world's regions is shown in Figure 3.

Age

The medium variant also shows a

Figure 3: Population size of the major areas of the world, 1950-2150, medium variant, 1998 projections



Source: *Population and Development Review*, vol. 24, no. 2, 1998, p. 188

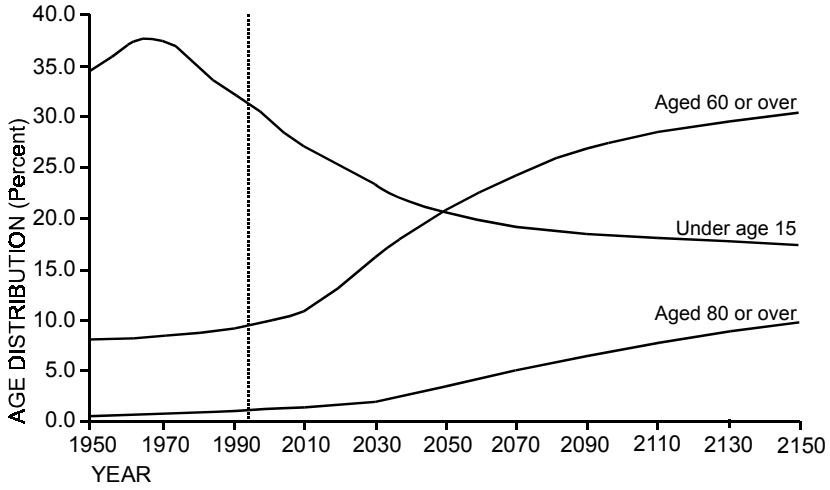
substantial shift in age structure. (See Figure 4.) Under the medium variant's assumptions, the average (median) age of the world's population will rise from 25.4 years in 1995 to 36.5 years in 2050 and 42.9 years in 2150. The proportion of the global population aged under 15 years will decline from 31 per cent in 1995 to 17 per cent in 2150 while that of people aged 60 and over will increase from nine to 30 per cent. The number aged 80 and over will grow from 61 million in 1995 to 320 million in 2050. These figures show that the proportion of the world's population aged 60 plus is increasing at an unprecedented rate.

But past high fertility means that there are now more young people (over one billion aged between 15 and 24) than ever before. These young people are entering the workforce-entry age groups, putting pressure on the available job opportunities, and unprecedented numbers of young women are also entering the child-bearing age groups.

HIV/AIDS

An interesting element in the projections is an analysis of the demographic impact of HIV/AIDS. This was carried out for 34 countries, those which had a population of at least one million persons and an adult HIV prevalence of two per cent or more (29 countries in Sub Saharan Africa, three in Asia and two in South America). These countries have 26 million of the global 30 million persons with HIV/AIDS. In Africa, life expectancy at birth in 1995-2000 is 47 years. It would have been expected to be 54 without HIV/AIDS. However, even in the countries most severely affected, HIV/AIDS will not lead to population decline.

Figure 4: Percentage of the world's population under age 15, aged 60 or over, and aged 80 or over, 1950-2150, medium variant, 1998 projections



Source: *Population and Development Review*, vol. 24, no. 2, 1998, p. 188

DISCUSSION

The current annual global population growth rate is 1.33 per cent. In 1997 the Australian TFR was 1.8 but Australia's population growth rate between 1997 and 1998 is 1.22 per cent.[5] It is interesting to note that, despite below replacement fertility, Australia's growth rates are on a par with global levels. This is because of continued net migration gains and the country's age structure. But as Caldwell has pointed out, natural increase is almost a thing of the past in Australia and will be so within another decade.[6] In future if the population is not to decline after around 2021, net immigration gains will be necessary.[7]

Some respected commentators have suggested that the global fertility decline will not only continue but that the global TFR will be even lower than the UN's low projection of 1.6. Caldwell and Caldwell have suggested that this might lead to a maximum global population that would peak at eight billion. Moreover, they argue that it is likely that once global numbers peaked, the world population would not remain stationery but would then gradually decline and perhaps pass the current global population on the way down some hundred years into the future.[8] During the twentieth century the world's population grew from 1.5 billion to six billion. Caldwell has characterised this as the 'demographic century'. He points out that this rapid growth was unprecedented and argues that it will never be repeated.[9]

Some commentators have suggested that the current slowing of the world's population growth rates was inevitable. As Caldwell points out, '[T]hey imply that there was no need for the fuss or the organisation and even that the making of contraception easily available and its use respectable was a mistake'.[10] In the Australian context Brunton, for example, has argued that fears that the earth is about to exceed its carrying capacity are without foundation. He questions the motives of those advocating population control and argues that Australia should not be involved in assisting with family planning programs.[11] Others (for example, Bongaarts)[12] have maintained that despite the achievements of lower fertility, population growth in developing countries remains a major problem and will continue to hamper ongoing efforts to reduce poverty and achieve sustainable development. As Gelbard, Haub and Kent have pointed out:

> One of the greatest success stories of the 20th century has been the dramatic decline in child bearing brought about by investments in family planning and other health programmes, in education and in greater social and economic opportunities, especially for women. In the 1990s, the world community made financial and program commitments to continue investments in these areas. Both the future size of the world's population and the quality of people's lives will be closely linked to the extent to which these commitments are met.[13]

References

1. United Nations Population Division, *World Population Projections to 2150*, United Nations, New York, 1998
2. United Nations Population Division, *World Population Prospects: The 1996 Revision*, United Nations, New York, 1998
3. The TFR can be defined as the sum of age-specific fertility rates (live births at each age of mother per female population of that age). It represents the number of children a women would bear during her lifetime if she experienced current age-specific fertility rates at each age of her reproductive life.
4. J. C. Caldwell, Population...Explosion or Implosion? Address to the National Press Club, Canberra, 17 March 1999 (unpublished)
5. *Australian Demographic Statistics September Quarter 1998*, Cat. no. 3101.0, Australian Bureau of Statistics, Canberra, 1999
6. Caldwell, 1999, op. cit.

[7] P. McDonald and R. Kippen, Population Futures for Australia: The Policy Alternatives, Vital Issues Seminar, Canberra, 31 March 1999 (unpublished)

[8] J. C. Caldwell, and B. K. Caldwell, 'Is fertility in developing countries likely to fall and stay below long-term replacement level? Precedents and mechanisms in developing countries', report to the US National Academy of Science, 1999

[9] Caldwell, 1999, op. cit.

[10] ibid., p. 2

[11] R. Brunton, 'The End of the Overpopulation Crisis?' *IPA Backgrounder*, vol. 10, no. 5, 1998, p. 18

[12] J. Bongaarts, 'Demographic Consequences of Declining Fertility', *Science*, vol. 282, pp. 419-420

[13] A. Gelbard, C. Haub, and M. M. Kent, 'World population beyond six billion', *Population Bulletin*, vol. 54, no. 4, 1999, pp. 1-44

THE END

Following article appears here in print journal.