

Contemporary global population change

The twentieth century can be characterised as the demographic century. The world's population grew more than three fold from 1.8 billion in 1900 to 6.07 billion in 2000. The current century will see the stabilisation of the global population and the speed with which this will occur will be of considerable significance for the environment, resources and the levels of living enjoyed by the world's population.

The slow down in the rate of growth of the world's population from a peak of over 2 percent in some years of the 1970s to a current level of around 1.3 percent has been one of the most profound global changes of the last three decades. As Table 1 shows, it took several million years for the globe's population to increase to one billion but each successive billion took increasingly fewer years until the last (sixth) billion was added in 12 years. However, the seventh and later billions will take increasingly longer periods.

This paper summarises the findings of the latest biannual revision of world population projections made by the United Nations Population Division (2003a). It is worth noting that these projections are not intended as forecasts but indicate the population outcomes of a number of well defined and plausible (but hypothetical) scenarios of demographic change.

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A Decline in the Momentum of Population Growth

A most striking feature of the 2002 revision of world projections is a decline in the momentum of global population growth. This is evident in Table 1 indicating that there was a telescoping of the period taken to add an extra billion to the world's population up to 4 billion and the subsequent two billion have been added in only one year less than the preceding billion.

World Population Reached	It is Expected to Reach
1 billion in 1804	6 billion in 1999 (12 years later)
2 billion in 1927 (123 years later)	7 billion in 2013 (14 years later)
3 billion in 1960 (33 years later)	8 billion in 2028 (15 years later)
4 billion in 1974 (14 years later)	9 billion in 2054 (26 years later)
5 billion in 1987 (13 years later)	

Table 1: World Population Growth
Source: Populi December 1998, p. 3; Population Reference Bureau 1999, p. 2

Region	1990	1996	1998	2002
World	8,504	8,309	8,039	7851
MDCs	1,354	1,319	--	1241
LDCs	7,150	6,721	--	6610
Europe	515	502	701*	696*
North America	332	369	369	394
Former USSR	352	297	--	--
Oceania	38	41	41	40
Africa	1,597	1,454	1,454	1292
Latin America/ Caribbean	757	690	690	687
Asia	4,912	4,686	4,784*	4742*

* includes former part of USSR

Table 2: Changes in the Projections of Population in 2025, 1990, 1996, 1998 and 2002 Revisions of World Population (Medium Variant)
Source: United Nations Population Division 1998 and 2003a

Indeed, it is calculated that the seventh and eighth billion will take longer to add than the last two billion. Table 2 indicates that the UN projections done for 1990 and based on trends at that time projected a world population of 8.504 billion, but the most recent projections done in 2002 project a total of 7,851 million - 653 million or 7.7 % less.

This points to the massive and sustained falls in fertility which have occurred especially over the last two decades. The effect of this in reducing population growth rates has been counterbalanced to a degree by improvements in life expectancy but is still strikingly evident in the new projections.

The change in global fertility levels has been striking. To give an indication of the extent to which fertility has declined in Asian countries, the example of Indonesia is shown in Figure 1, which shows that the Total Fertility Rate¹ 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 (1999) points out that 44 percent of the world's population now lives in countries with below replacement fertility. Asian fertility has been declining for two decades but more recently in parts of Sub Saharan Africa, fertility has begun to decline.

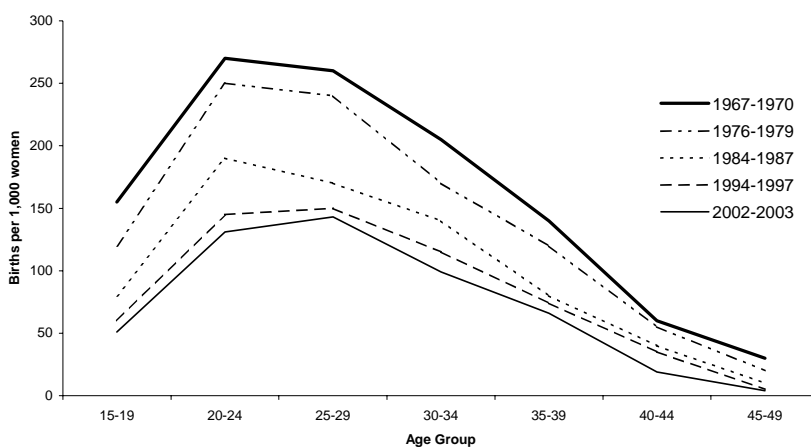


Figure 1: Indonesia: Age-Specific Fertility Rates, 1967-2003
Source: Indonesia Demographic and Health Surveys

Results of the Projections

The results of the world population projections based on five different fertility scenarios are presented in Table 3. It can be seen that the various fertility assumptions result in a wide range of population outcomes by 2150 although the usual practice is to adopt the medium fertility scenario as the most likely outcome

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. The main results flowing from the projections are as follows:

1. The medium fertility scenario sees the world's population growing from 6 billion at present to 8.9 billion in 2050, 9.1 billion in 2100 and 8.5 billion in 2150 and will stabilise around 9 billion persons around 2300. The annual population increment declined from its peak of 86 million in 1985-90 to 74 million at present and is projected to decline to 64 million between 2015 and 2020 and drop sharply to 30 million per year between 2045 and 2050. The rate of annual population growth will decline from a present level of 1.19 percent to 0.42 percent in 2045 to 2050.

Year	Fertility Scenarios				Instant Replacement
	Medium	High	Low	Constant	
1950	2.5	2.5	2.5	2.5	2.5
2000	6.1	6.1	6.1	6.1	6.1
2050	8.9	10.6	7.4	12.8	8.0
2100	9.1	14.0	5.5	43.6	8.5
2150	8.5	16.7	3.9	244.4	8.3

Table 3: World Population Projections Based on Five Scenarios, 1950-2150 (in billions)

Source: United Nations 2003b

2. Although the high and low fertility scenarios differ by just one child per couple, half a child above and half a child below replacement fertility levels, the size of the world population in 2150 would range from 3.9 billion persons to 16.7 billion!! The crucial importance of maintaining the decline in global fertility is evident in Figure 2, which shows different trajectories of future population growth with different fertility levels.
3. The future will see a continued geographical shift in the distribution of the global population which will shift away from more developed areas which had 33.2 percent of the population in 1950, 18.9 percent at present and are projected to have only 10 percent in 2150.

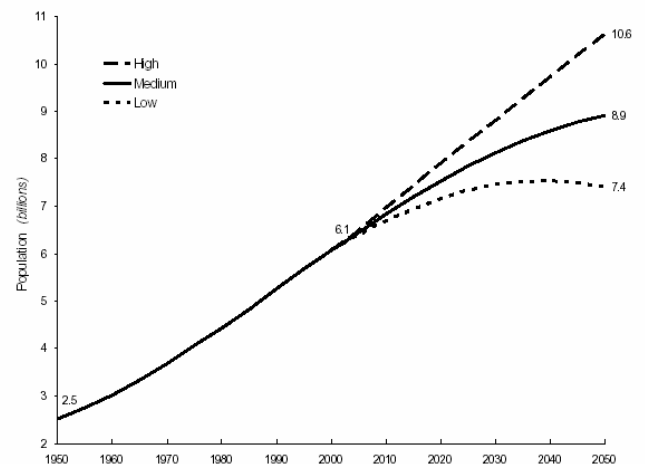


Figure 2: Estimated World Population, 1950-2000, and Projections: 2000-2050
Source: United Nations 2004, 5

Table 4 indicates that Africa's share of the global population increased from 8.8 to 13.8 percent between 1950 and 2004 and will account for over a fifth of the world's population by 2050. Asia still dominates the global population but its share will decline marginally as the low fertility common in the region takes affect.

	Number			Percent		
	1950	2004	2050	1950	2004	2050
World	2,521	6,396	8,919	100	100	100
More developed regions	813	1,206	1,220	32.2	18.9	13.6
Less developed regions	1,709	5,190	7,699	67.8	81.1	86.4
Africa	221	885	1,803	8.8	13.8	20.9
Asia	1,402	3,875	5,222	55.6	60.6	58.1
Europe	547	728	632	21.7	11.4	7.2
Latin America and the Caribbean	167	549	768	6.6	8.6	8.4
Northern America	172	326	448	6.8	5.1	4.9
Oceania	13	33	46	0.5	0.5	0.5

Table 4: Population of the Major Regions of the World 1950, 2004 and 2050 (Population in Millions, Medium Variant)

Source: United Nations 2003a and Population Reference Bureau 2004

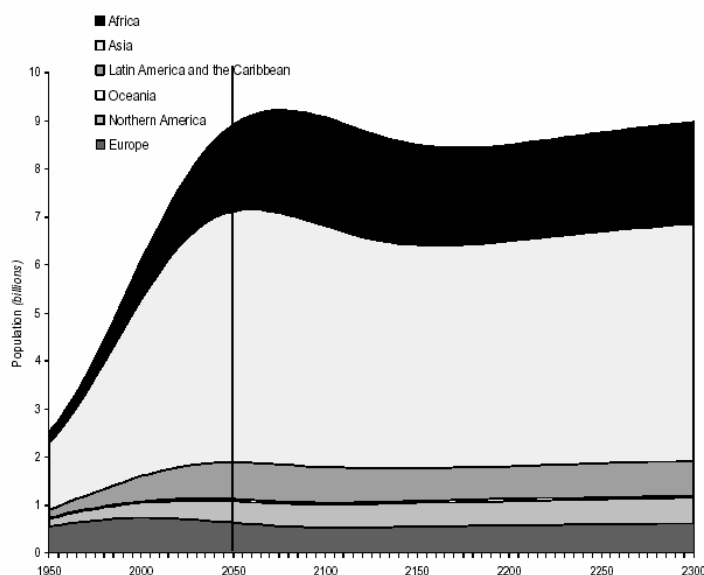
The proportion of the world population living in Europe fell from more than a fifth in 1950 to 11.4 percent in 2004 and will drop to 7.2 percent in 2050. Ninety-seven percent of the world's population increase takes place in less developed countries. Every year the population of Asia is increasing by 50 million and that of Africa by 17 million.

Sixty percent of global population increase is contributed to by 10 countries (Asia, China, Pakistan, Indonesia, Nigeria, USA, Brazil, Bangladesh, Mexico and the Philippines). Currently 2 out of 5 world citizens live in China (1300 billion people) or India (1087 million) and there are nine other nations with more than 100 million residents (USA, Mexico, Indonesia, Brazil, Pakistan, Russian Federation, Japan, Bangladesh, Nigeria).

By 2050 seven additional countries will be added to this list (Ethiopia, Democratic Republic of the Congo, Philippines, Viet Nam, Iran, Egypt and Turkey). 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.

Figure 3: Population in Major Areas, Estimates and Medium Scenario: 1950-2300

Source: United Nations 2004, 23



The projections show a substantial shift in age structure (Figure 4). The median age of the world population will rise from 25.4 years in 1995 to 36.5 years in 2050 to 42.9 years by 2150.

The proportion of the global population aged under 15 years will decline from 31 percent in 1995 to 17 percent by 2150 while that aged 60 and over will increase from 9 to 30 percent. Those aged over 80 will grow from 61 million in 1995 to 320 million in 2050. The proportion of the world's population aged 65 years and over are increasing at an unprecedented rate.

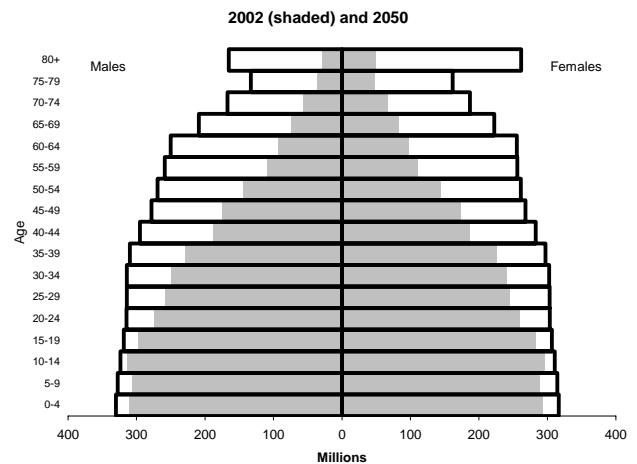


Figure 4: Age-Sex Structure of World Population: 2002 and 2050

Source: U.S. Census Bureau, International Programs Center, International Data Base

An interesting element in the projections was an analysis of the demographic impact of HIV/AIDS in 34 countries with a population of at least 1 million persons and adult HIV prevalence of 2 percent or more (29 in Sub Saharan Africa, 3 in Asia and 2 in South America).

These countries have 26 of the global 30 million persons with HIV/AIDS. In Africa, life expectancy in 1995-2000 was 47 but would have been expected to be 54 without HIV/AIDS.

Past high fertility means that more young people than ever before (over 1 billion aged between 15 and 24) are entering the workforce entry age groups putting pressure on the available job opportunities. Moreover, unprecedented numbers of women are entering the child-bearing age groups.

Discussion

It is interesting to note that while the current global population growth rate is 1.19 percent, this compares to a similar figure (1.18 percent) for Australia between 2002 and 2004 (ABS 2004). Australia's population growth rates are similar to global levels despite fertility levels (2003 TFR=1.7) being below replacement level due to continued net migration gains and its age structure.

As Caldwell (1999) has pointed out, natural increase is almost a thing of the past in Australia and will be so within another decade or so. Net immigration gains will be necessary to prevent a reduction in population size (McDonald and Kippen 1999).

Some respected commentators have suggested that global fertility decline will not only continue but do so beyond the levels suggested by the United Nations. Caldwell and Caldwell (1999) have suggested that this may lead to the maximum that global population will peak at being as low as 8 billion.

Moreover, that it is likely that once global numbers peak, the world population will not remain stationary but will then gradually decline and perhaps pass the current global population on the way down a bit over a century in the future.

Caldwell (1999) has characterised the twentieth century as the "demographic century" which saw the world's population increase from 1.5 to 6 billion and this rapid growth was unprecedented and never to be repeated.

Some commentators have suggested that the current slowing population growth rates were inevitable and as Caldwell (1999, 2) points out "they 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."

In the Australian context Brunton (1998) for example has argued that fears that the earth is about to exceed its carrying capacity are without foundation, questions the motives of those advocating population control and advocates that Australia not be involved in assisting family planning programs.

Others (e.g. Bongaarts 1998) 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 (1999, 40) 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."

1 The Total Fertility Rate 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 woman would bear during her lifetime if she experienced current age-specific fertility rates at each age of her reproductive life.

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