1 Increasing global divergence in population trends

The global population will still be growing midway through the 21st century but at a slower rate than in the past. People will live longer, be better educated and migrate more. Some populations will increase as others shrink. Migration is only one of the unpredictable prospects for Europe and the world.

The main demographic characteristics of this century are expected to be:

- ageing of societies, which will spread to most countries;
- slower global population growth, with major regional differences;
- migration, especially caused by environmental factors.

Today the world population is continuing to grow, although much more slowly than in the recent past. It has more than doubled since the 1960s but is very unlikely to double again during the current century (IIASA, 2007). Instead, it is expected to peak at approximately nine billion by around 2050 (UN Population Division, 2009) or 2070 (IIASA, 2007). There is a less than 10 % chance that in 2100 there will be fewer people than today, or that the total will exceed 11 billion (Lutz et al., 2008).

Considerable differences exist, however, in terms of projected regional population growth. A major decline is forecast in eastern Europe ([1]), where the population is expected to be less than half today's level by 2100. Contrastingly, in many African countries the population is likely to have doubled by 2100 (IIASA, 2007).

([1]) The IIASA grouping for eastern Europe comprises Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, the former Yugoslav Republic of Macedonia, Hungary, Moldova, Montenegro, Poland, Romania, Serbia, the Slovak Republic, Slovenia, Russia and Ukraine.

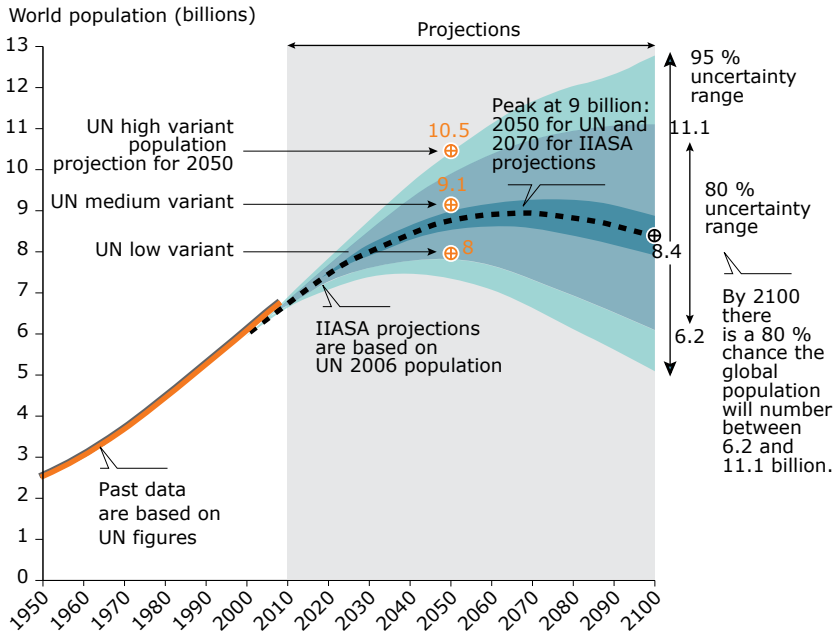
From 2020–2030 onwards, declining populations are also expected in some developing countries, especially in Asia. Most of the countries of North America and western Europe ([2]) are still growing despite ageing, mostly due to migration ([3]). However, it is expected that they will also register declines if policies are not introduced to compensate for the impacts of advanced ageing, for example measures to attract migrants.

China can expect a dramatic demographic transformation with a massive shift in age structure. China's population is projected to start declining around 2030 and the working age population, which currently provides one of the biggest drivers of economic growth, will decline rapidly both in absolute terms and as a proportion of the total population. After initially increasing, by mid-century China's population will have fallen to its size in 2000 and by the end of the century it may have halved from the 2000 level. China's trends are qualified, however, by considerable uncertainty over expected fertility rates, gender balance (the relative number of baby girls born is declining due to the one-child policy), the population's age structure and the current size of the population (IIASA, 2007).

([2]) The IIASA grouping for western Europe comprises Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Greenland, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Malta, Monaco, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

([3]) In developed countries, immigrants accounted for nearly half of the population growth rate in the 1990s (IIASA, 2008, 2009).

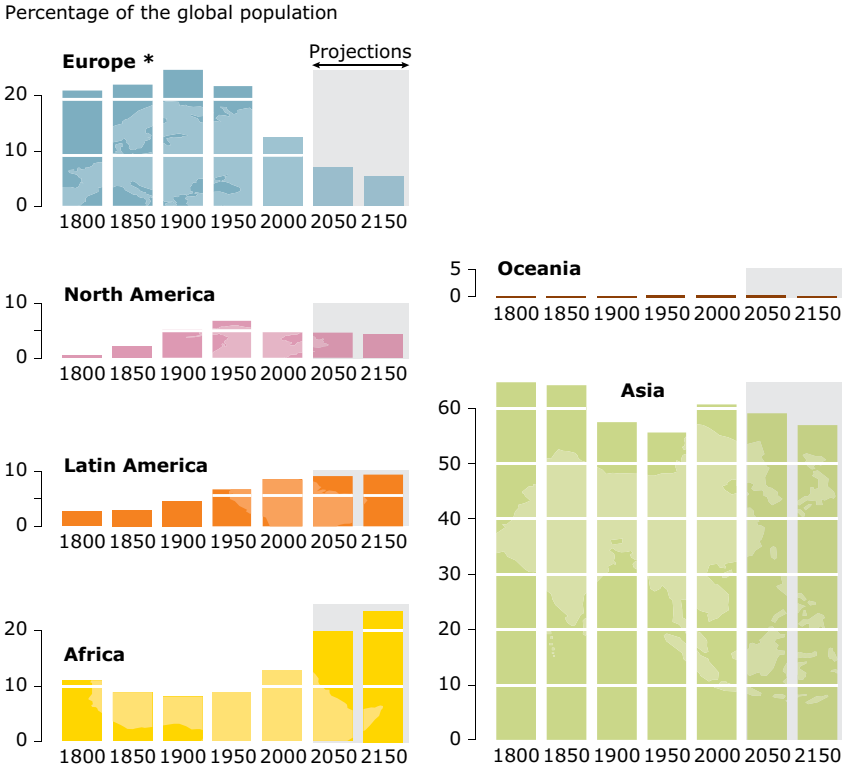
Figure 1.1 World population projections



Note: The UN Population Division studies fertility-evolution scenarios to produce high-, medium- and low-variant figures, whereas IIASA bases its calculations on assumptions for fertility, mortality and migration (with the latter only affecting regional projections).

Source: IIASA, 2007; UN Population Division, 2009.

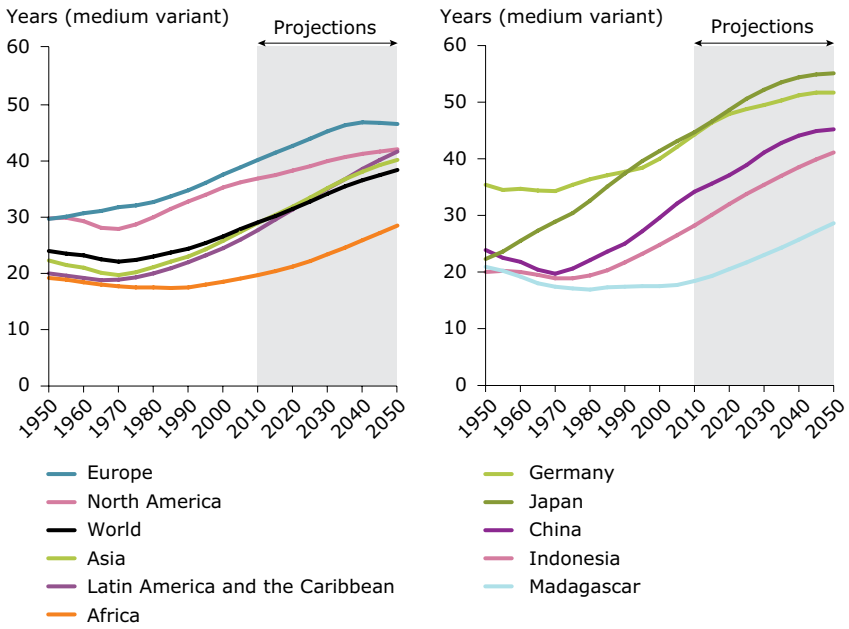
Figure 1.2 Regional shares of the global population



Note: * In its geographical definition (including Russia up to the Ural Mountains).

Source: UN Population Division, 1999; Le Monde Diplomatique, 2009.

Figure 1.3 Median age projections: selected regions and countries



Note: Median age is the age that divides a population into two numerically equal groups: half the people are younger and half are older.

Source: UN Population Division, 2009.

Demographers expect the average age of populations to rise throughout this century. Particularly rapid increases are foreseen in the next few decades, especially in some developing countries (notably China, some Pacific islands and central Asian states). From about 2030 to 2050, this trend will spread to most regions of the world (Lutz et al., 2008; NIC, 2008).

There are obvious differences between developed and developing countries in terms of the speed of ageing. By 2050, developing countries are expected to be ageing as fast as the developed world is now (Jackson and Howe, 2008). Developing countries will have less time to adapt than developed countries and face challenges in addressing changes in the structure of society with limited resources.

One significant impact of ageing is on the size of the working population. It has already peaked in developed countries and is expected to peak in around 2015 in China (Lutz, 2009; CIA, 2001). The oldest in society are also more vulnerable to disease and climate change impacts, placing new demands on society (CIA, 2001; DG ECFIN, 2009).

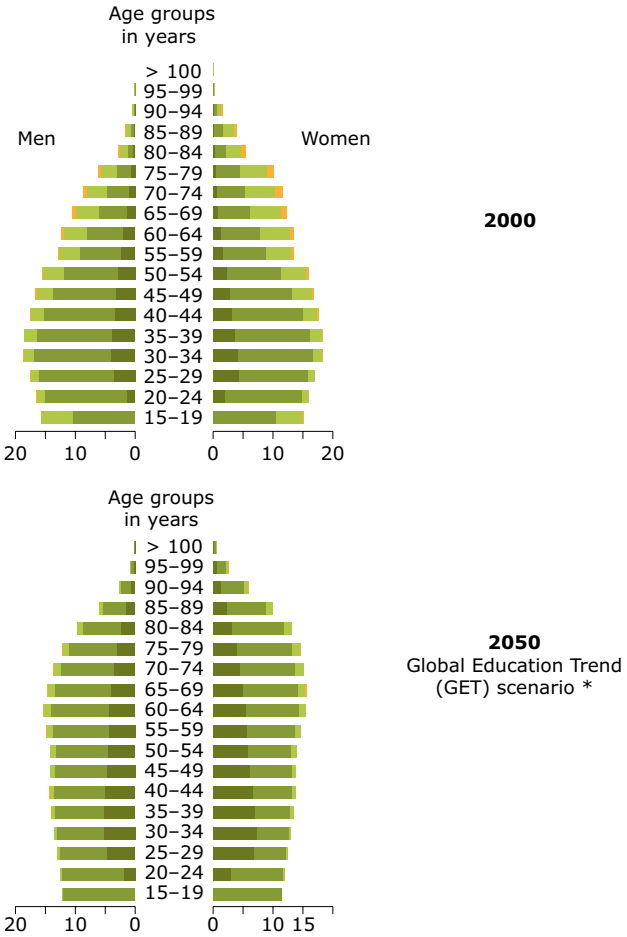
In contrast to the marked ageing of many developed world populations, many developing country populations will have substantial 'youth bulges' (disproportionate concentrations of people in the 15–29 year-old age group) until 2025. Several of the countries with the largest bulges are located in in sub-Saharan Africa and the Middle East and are among the world's most unstable (or potentially unstable) states. Figures 1.4a and 1.4b illustrate among others the growing disparity between the age structure of the European Union and Africa.

These demographic differences, combined with growing economic disparities, are increasing the pressure for migration, which is expected to become a more important factor in demographic change over the next 50 years. Environmentally induced migration will gain in importance (see Map 3.1). Migration significantly affects ethnic diversity, age composition and the size of the workforce in recipient countries.

While there is reasonable confidence over broad trends in the shorter term, substantial uncertainty attaches to the specific trend for any country or region (NRC, 2001).

Figure 1.4a Population pyramids for 2000 and 2050 — European Union

Population by age, sex and educational attainment



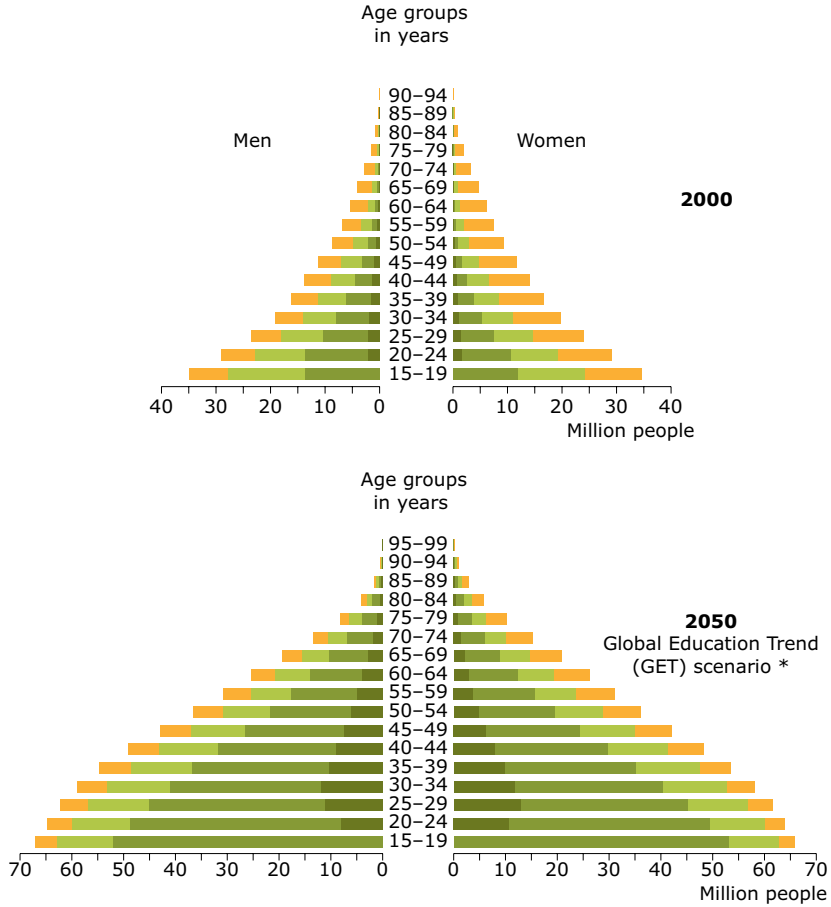
Educational attainment: Higher education; Secondary education; Some primary education; No formal education

Note: * The GET scenario is not derived from a simple assumption. It is based on the country's educational expansion of historical trend.

Source: Samir et al., 2010.

Figure 1.4b Population pyramids for 2000 and 2050 — Africa

Population by age, sex and educational attainment

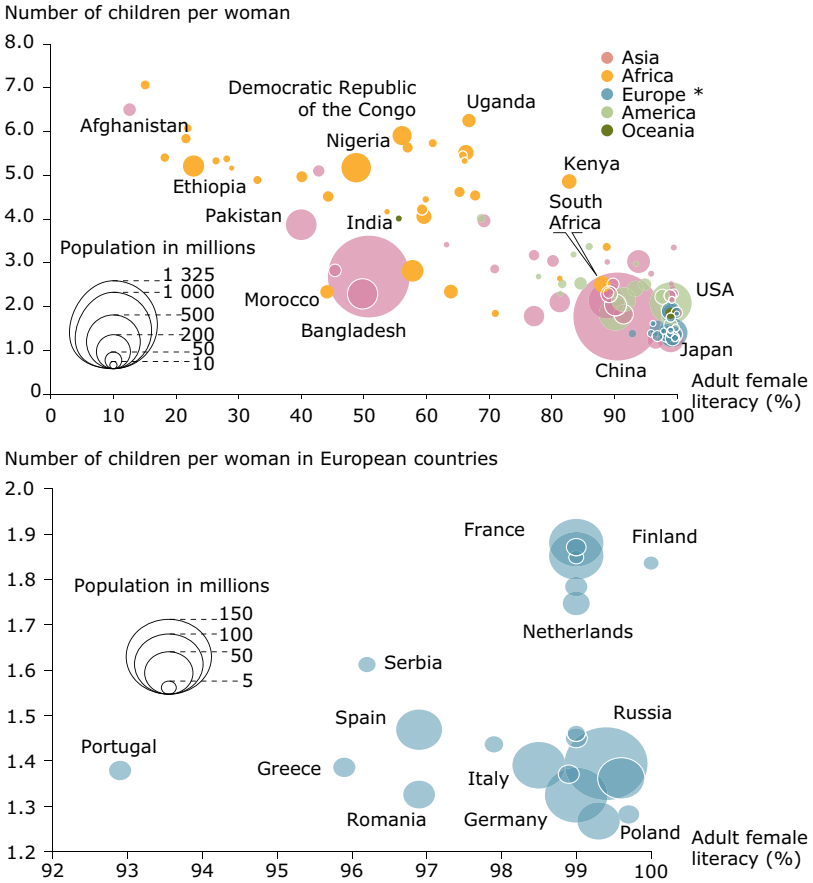


Educational attainment: Higher education; Secondary education; Some primary education; No formal education

Note: * The GET scenario is not derived from a simple assumption. It is based on the country's educational expansion of historical trend.

Source: Samir et al., 2010.

Figure 1.5 Correlation between fertility and female education



Note: Adult literacy rate is the percentage of people aged 15 and above who can, with understanding, read and write a short, simple statement on their everyday life.

Please note the scale difference between the two graphics.

* The European countries considered here are: Belarus, Belgium, Bulgaria, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Poland, Portugal, Romania, Russia, Serbia, Spain, Sweden, Switzerland, the Netherlands, Ukraine, the United Kingdom.
Data: 2000 to 2009.

Source: UNESCO, 2010; World Bank, 2010; UN Population Division, 2009; Gapminder, 2010.

After 1950, migration was driven by the liberalisation of trade in goods and by movements of capital, and was further accelerated by differences in income and by conflict. Migration can benefit both host countries, for example by filling a labour gap, and home countries through remittances. Migrations are complex and uncertain phenomena which depend on a range of undefined social, economic and environmental factors. There is currently no way to consider these uncertainties in projections.

From a development perspective, what matters is not simply the number of people in a country but also the population's productive potential or human capital (DRC, 2008). The shifting distribution of human capital (quantified in terms of the people of working age with at least a secondary education) differs from the main demographic trends. Europe and North America possess the most human capital today but in the future Asia is expected to show the biggest gains, with Africa remaining at the bottom. By around 2015 China's human capital will overtake Europe's and North America's combined (Poncet, 2006).

Box 1.1 Why is demography important for Europe?

Population growth influences most global megatrends. The anticipated end of population growth during the current century will not solve the world's problems but can help efforts towards sustainable development.

A growing population normally increases natural resource use and environmental pollution, and causes land use changes like urbanisation. Shifts in global demographic trends will have indirect impacts on the European environment through climate change and resource consumption. Migration into Europe may partially compensate for the natural decline of Europe's population and workforce, but ensuring that it occurs will require substantial policy interventions at a regional and national level (Nimwegen and Erf, 2010).

Pearce (2010) has questioned that notion that overpopulation itself threatens planetary crisis. It is not that there are too many of us for the planet to sustain but that we are collectively using up more resources than the planet can produce. The use of natural resources is driven more by economic growth than population growth in a growing number of regions.

Key drivers and uncertainties

Fertility, mortality, migration, economic development, poverty and governance are the main drivers of population growth. Uncertainty abounds, however, for example with respect to migration flows, female education and access to birth control, fertility rates, access to health care and life expectancy (NIC, 2008). How will government policies on education, health, migration and urbanisation develop? How will technology improve the lives of elderly people? There is even uncertainty over our current situation, including fertility levels in China and HIV/AIDS prevalence in Africa (IIASA, 2007).

The development of fertility rates in different parts of the world is uncertain, especially after the transition to older societies in developed countries. Half the world already has a fertility rate below the long-term replacement level. That includes all of Europe, and much of the Caribbean and the far East. Even small changes in fertility rates can lead to significant changes in population sizes. Globally, women today have half as many babies as their mothers did, mostly from choice. The average age at which women have children influences population dynamics. In addition, Figure 1.5 illustrates the clear correlation between fertility rates and levels of female education.

Concerning mortality, demographers have historically tended to underestimate gains in life expectancy, which has affected population ageing predictions. New approaches and alternative indicators are being developed to take into account the effect of longer, healthier lives. Uncertainties regarding life expectancy relate to the biological upper limit of the human lifespan (particularly in developed countries) and to the efficiency of local health services (especially in developing countries). Uncertainties also exist regarding how far the positive effects of longer, healthier lives will be cancelled out by other trends such as increased inequalities, decreasing health of poor people and the spread of diseases. The links between ageing and economic growth are now better understood, however, showing that ageing's costs to society may be less than predicted earlier (Pearce, 2010).

Life expectancy rose rapidly in the 20th century, thanks to improvements in public health, nutrition and medicine. It is expected to increase further (Figure 1.3), supported by technology and economic development and access to health care, although the

associated costs could restrict many of the benefits to the wealthiest in society. Access to health care, clean drinking water, sanitation, family planning services, healthy food and advanced treatment varies and could cause increasing health gaps between rich and poor. These inequalities exist between regions but also within countries and cities, especially in emerging economies (EEA, 2010a).

Poverty is a key driver of migration, which is considered the most uncertain driver of population growth (IIASA, 2007). Economic growth, environmental degradation, climate change impacts and migration policies are the main uncertainties influencing international migration flows.

The increasing uncertainties and complexity in projected demographic trends suggest that existing population forecasting methods are inadequate. With this in mind, it is important that decision-makers relying on scenario studies gain a better understanding of uncertainty and the way that projections are made (Lutz, 2009). To achieve that, uncertainties and assumptions on which projections are based need to be communicated better to users (IIASA, 2007).