



Demographic Upheaval

David E. Bloom

The world will struggle with population growth, aging, migration, and urbanization

HUMANKIND is being buffeted by the forces of demographic change.

The most prominent changes are rapid population growth in some developing economies and shifting shares of adolescents and young adults in others, increasing longevity and population aging throughout the world, and urbanization and international migration.

All pose formidable challenges—threatening economic growth, fiscal stability, environmental quality, and human security and welfare.

But none are insurmountable. They will be best dealt with if public and private policymakers act decisively, collaboratively, and soon. That includes reform of retirement policy, development of global immigration policy, provision of contraception to many millions of women, and further improvements in child survival and treatment of chronic disease.

World population grows

Population growth was extremely slow throughout most of human history. It took until the early 19th century for world population to hit 1 billion and until the 1920s to reach 2 billion. But during the past century,

world population has grown significantly faster. It reached 3 billion in 1960 and jumped to 7 billion in 2011.

At the beginning of 2016, world population was 7.4 billion, and it is projected to increase another 83 million this year—representing the difference between 140 million births and 57 million deaths. Medium-variant projections by the United Nations Population Division (UNPD), which assume that fertility behavior evolves consistently with past trends and patterns, indicate that world population will surpass 8 billion in 2024, 9 billion in 2038, and 10 billion in 2056. Reaching 10 billion would be the equivalent of adding China and India to the current world population.

Admittedly, there is some uncertainty about these projections. For example, under the UNPD's low-variant projection (which assumes fertility is half a child lower), world population will not reach 8 billion until 2026; under the high-variant projection (fertility half a child higher), it will reach that level in 2022. But under almost any circumstances, the world is on a historically unprecedented population trajectory (see Chart 1).

Ninety-nine percent of projected growth over the next four decades will occur in countries that are classified as less devel-

oped—Africa, Asia (excluding Japan), Latin America and the Caribbean, Melanesia, Micronesia, and Polynesia. Africa is currently home to one-sixth of the world’s population, but between now and 2050, it will account for 54 percent of global population growth. Africa’s population is projected to catch up to that of the more-developed regions (Australia, Europe, Japan, New Zealand, and northern America—mainly Canada and the United States) by 2018; by 2050, it will be nearly double their size.

Between now and mid-2050, other notable projected shifts in population include:

- India surpassing China in 2022 to have the largest national population;
- Nigeria reaching nearly 400 million people, more than double its current level, moving it ahead of Brazil, Indonesia, Pakistan, and the United States to become the world’s third-largest population;
- Russia’s population declining 10 percent and Mexico’s growing slightly below the 32 percent world rate to drop both countries from the top 10 list of national populations, while the Democratic Republic of the Congo (153 percent increase) and Ethiopia (90 percent) join the top 10; and
- Eighteen countries—mostly in eastern Europe (and including Russia)—experiencing population declines of 10 percent or more, while 30 countries (mostly in sub-Saharan Africa) at least double their populations.

Rapid population growth poses significant challenges. Among them is the need to provide jobs for large numbers of people and give them the human capital (quality education, training, and health) they need to be productive. Nations must also lay down the requisite physical capital and infrastructure to support higher employment; otherwise mass suffering and political, social, and economic instability and conflict could become ever more common. Increased inequality across countries could also deter international cooperation, stalling or even reversing the globalization process, which has great

potential to elevate standards of living around the world. In addition, rapid population growth tends to impose pressure on ecosystems and natural resources, undermining food, energy, and water security—promoting the degradation of local and global environmental quality and diminishing the prospects for remediation and adaptation.

It has been estimated that a daunting 734 million new jobs are needed globally between 2010 and 2030 to accommodate projected increases in population, account for plausible changes in labor force participation rates, and achieve target unemployment rates of 4 percent or lower for adults and 8 percent or lower for youth.

Where people live

As the number of people grew over the second half of the 20th century, so did population density, with considerable variation across geographic regions and countries. In 1950, population density ranged from 1.5 people a square kilometer in Oceania to 45 in Asia. Today, it ranges from 5 to 142 across those same regions.

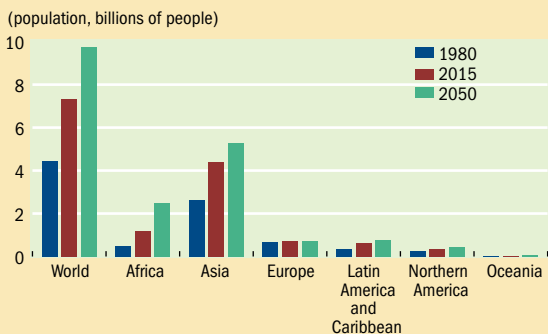
The center of gravity for world population continues to shift to the less-developed regions. It is also shifting from rural to urban areas as a result of migration, rising birth and declining mortality rates in urban areas, and rural settings growing into urban areas. More than half the world’s population now lives in urban areas, up from 30 percent in 1950, and the proportion is projected to reach two-thirds by 2050 (see Chart 2). Africa’s population is the least urbanized, with 40 percent of its people living in urban settings—just half the proportion of Latin America and the Caribbean, which is the most urbanized developing region. Fifty percent of Asia’s population is projected to be living in urban areas in the next few years.

The number of megacities—urban areas with populations greater than 10 million—grew from 4 in 1975 to 29 today. Megacities are home to 471 million people—12 percent of the

Chart 1

Growing apace

World population is projected to increase steadily through 2050, led by Africa and Asia. Other regions will grow slowly, if at all.



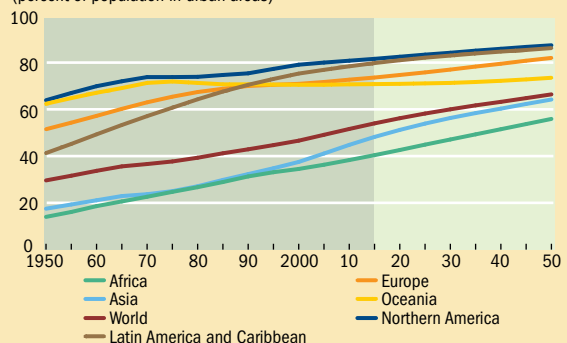
Source: United Nations, Department of Economic and Social Affairs, Population Division (2015).

Chart 2

Fleeing the farm

More than half the world’s people live in urban areas, and by 2050 two-thirds will.

(percent of population in urban areas)



Source: United Nations, Department of Economic and Social Affairs, Population Division (2014).

Note: Period after 2015 is a projection.

world's urban population and 6 percent of the world's total population. The United Nations recently introduced the concept of metacities, which are urban areas with 20 million or more residents. Eight cities had reached "meta" status in 2015. Tokyo heads the list, with 38 million residents—more than the population of Canada. No. 2 Delhi's 26 million exceeds Australia's population. Other metacities are Shanghai, São Paulo, Mumbai, Mexico City, Beijing, and Osaka. By 2025, Dhaka, Karachi, Lagos, and Cairo are projected to grow into metacities.

There is an intense debate about the implications of these spatial distributions of people. Some stress the economic benefits that accompany urban concentrations, such as large pools of labor and markets for selling goods and services. Others highlight the pressure that dense urban populations place on land, air, and water resources; urban dwellers' disproportionate consumption of fossil fuels and corresponding contribution to greenhouse gas emissions; and the fact that more than 1 billion of the world's population live in squalid urban slums.

Population dynamics

Notwithstanding the expanding numbers, the pace of population growth has recently begun to slow. Currently, world population is growing at 1.08 percent a year, which means a population doubling every 64 years. That rate is down from a high of 2.06 percent during 1965–70, or a doubling every 34 years. Africa has the highest growth rate at 2.44 percent (doubling every 28 years), and Europe's 0.04 percent is the lowest (a doubling time of 173 years). In fact, the overall rate of population growth is falling, and projected to continue falling, in every geographic region. For the world as a whole, the rate of population growth is projected to decline by half between now and 2050.

Demographers often describe the dynamic process of population growth using a "demographic transition" model, which reflects a shift from a regime of high birth and death rates to low birth and death rates. A key feature of the transition is that the mortality decline precedes the fertility decline, resulting in a period of population growth.

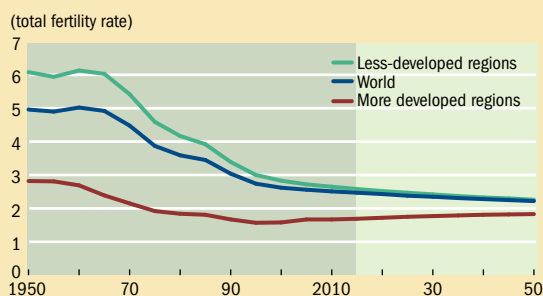
Mortality—The number of global deaths annually per 1,000 people has declined steadily from 19.2 in 1950–55, to 7.8 today. That decline reflects such factors as the development and widespread delivery of vaccines; other medical advances, such as the introduction of antibiotics and oral rehydration therapy; dietary improvements; public health interventions, including improved sanitation, safer drinking water, and insecticide-treated bed nets; expanded education (especially of mothers); and improvements in health system and other infrastructure. It corresponds to a 24-year gain in global life expectancy—from 47 in 1950–55 to 71 now. Given that the average newborn lived to about age 30 during most of human history, this 24-year increase, an average of nine hours of life expectancy a day for 65 years, is a truly astonishing human achievement—and one that has yet to run its course. Global life expectancy is projected to increase to 78 by 2050–55.

Life expectancy varies considerably across regions, from a low of 61 in Africa to a high of 80 in northern America.

Chart 3

Fewer kids

In 1950 the average woman bore five children. The average is now 2.5.



Source: United Nations, Department of Economic and Social Affairs, Population Division (2015).

Note: The United Nations defines the total fertility rate as the "average number of children a hypothetical cohort of women would have at the end of their reproductive period if they were subject during their whole lives to the fertility rates of a given period and if they were not subject to mortality." More-developed regions comprise Australia, Japan, New Zealand, and Northern America. Less-developed regions comprise Africa, Asia (except Japan), Latin America and the Caribbean, Melanesia, Micronesia, and Polynesia. Period after 2015 is a projection.

That nearly two-decade gap is projected to narrow somewhat in the coming years. Africa is expected to outperform all other regions in terms of both relative and absolute population health gains, reflecting, among other factors, economic catch-up and the diffusion of technology.

Improvements in child survival are a significant driver of life expectancy increases. Deaths of children under age 5 declined globally by more than 50 percent from 1990 to 2015, with improvements in every region, though proportionately less in sub-Saharan Africa and Oceania. The largest absolute numbers of child deaths occurred in India and Nigeria, which together account for 20 percent of world population and 23 percent of births—but 33 percent of child deaths. Preterm birth, pneumonia, complications associated with labor and delivery, diarrhea, and malaria are the leading causes of child mortality, with undernutrition a significant cofactor.

Despite major improvements in child survival, more than 16,000 children under age 5 died every day in 2015. Most of these deaths resulted from diseases and causes that are preventable or treatable using existing and affordable interventions.

Fertility—A decline in fertility is another major facet of the global demographic scene. In 1950, the average woman bore 5 children; today, she has 2.5 children (see Chart 3). Fertility rates vary widely across regions—from 1.6 in Europe to 4.6 in Africa. Across countries, fertility rates vary even more. They are 7.6 in Niger, 6.4 in Somalia, 6.1 in Mali and Chad, and 6.0 in Angola, but 1.2 in Singapore and 1.3 in Moldova, Bosnia and Herzegovina, Portugal, South Korea, Greece, and Spain. Roughly half the world's population lives in countries with fertility rates below the long-term replacement rate of approximately 2.1 children a woman.

In developing economies, improvements in child survival are a fundamental driver of fertility decline, which follows from the realization that fewer births are needed to reach target family size. Desired fertility also shrinks with educa-

tional progress and income growth. Lower fertility, in turn, promotes improvements in child survival, both through better maternal health and by allowing more family resources to be devoted to each child.

Access to contraception is also a key to fertility decline. Among 15- to 49-year-old women living with a male partner (married or otherwise), the overall rate of modern contraceptive use is 57 percent, with the main methods being female sterilization (used by 19 percent of the age group worldwide), intrauterine devices (14 percent), oral contraceptives (9 percent), male condoms (8 percent), and injectables (5 percent). Of the remaining 43 percent of women in this demographic, roughly two-fifths have an unmet need for family planning—meaning they are fecund, sexually active, and want to delay or forgo child bearing but are not using modern methods of contraception. The fraction drops to about one-fourth when traditional methods such as rhythm or withdrawal are included. In Africa the unmet need for contraception and fertility rates are both well above the global average.

International migration—Besides births and deaths, movements of people across borders represent the final channel through which national population size changes. Only 3.3 percent of the world's population, or 244 million people, live in countries other than the one in which they were born. Europe and northern America comprise 15 percent of world population, but are home to more than half of the world's international migrants. Nearly 20 percent of them are in the United States, followed by Germany and

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Russia with 5 percent each. The countries with the greatest numbers of emigrants are India (16 million), Mexico (12 million), Russia (11 million), and China (10 million). International migrants are mostly working age and evenly distributed by sex.

Although one of the greatest cross-continent mass migrations in recent history occurred in 2015—the exodus of more than 1 million Syrians to Europe—economic and institutional barriers to immigration remain significant, as does staunch social and political opposition in many advanced economies. However, migration has considerable potential to benefit not only those leaving their home countries but others in their origin and destination countries as well. Realization of that potential, however, depends on a variety of factors, including policies to support the migrants' integration into local economies. Many countries from which migrants leave oppose migration because it drains them of critical human resources such as physicians, engineers, and educators. Remittances are, however, a significant countervailing force: an estimated \$441 billion was sent to the developing world by migrants in 2015,

more than three times the amount of official development assistance and roughly two-thirds the level of direct foreign investment to developing nations. Remittances can significantly mitigate poverty and promote economic and social development through the accumulation of human and physical capital.

Age structure

Perhaps the most important of the global demographic developments is the changing population age structure. Three highly predictable sets of changes stand out: falling youth dependency (the ratio of children under 15 to the working-age population, 15 to 64), shifting numbers of adolescents and young adults (15- to 24-year-olds), and the rising proportion of older people (ages 60 and over or 65 and over). All these changes are linked to trends in the numbers of births and deaths. For example, falling death rates in the early phases of the demographic transition occur disproportionately among infants and children, which effectively launches a baby boom that lasts until fertility declines. As the baby-boomers get older, an age wave works its way through the population pyramid (see Chart 4), from the base (infants and children) to the midsections (15–24 and 25–59), to the peaks (60-plus and 80-plus). Similar changes in age structure occur as a result of sharply rising birthrates, such as the baby booms in many countries after World War II.

Because people's needs and capacities vary considerably over the life cycle, the consequences of changes in age structure can be significant. Children consume more output than they produce; they require lots of resources for food, clothing, housing, medical care, and schooling; and they typically do not work. By contrast, adults tend to contribute more than they consume—both through work and through their saving, which supports capital accumulation. The net contribution of the elderly is typically somewhere in between. People tend to work less as they reach advanced age and either save less or dip into savings to finance their consumption in retirement.

Demographic dividends—Changes in age structure can promote economic growth by creating the potential for what is known as a demographic dividend—a boost to income per capita associated with fertility decline, which reduces the burden of youth dependency, increases the proportion of workers and savers in the population, and allows resources to be reallocated from supporting children to building factories, laying down infrastructure, and investing in education and research and development.

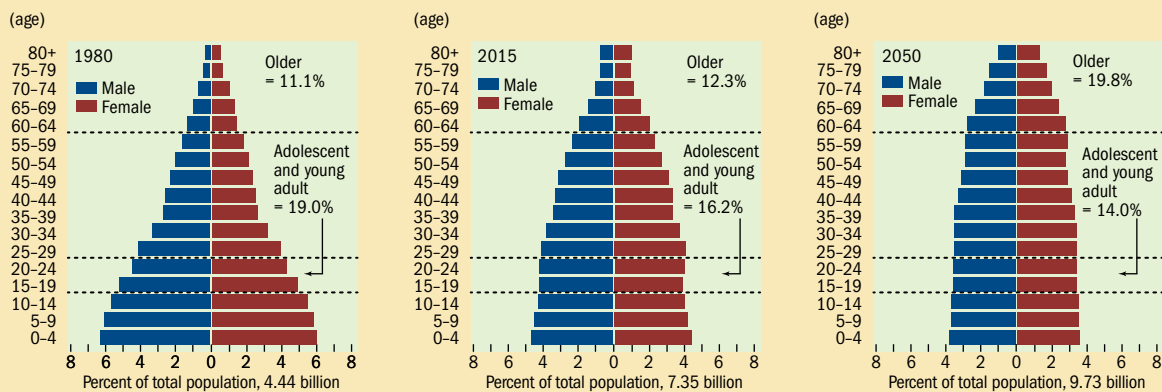
Declining fertility also tends to free women from child-bearing and child rearing, further boosting the labor supply. Similarly, saving rates tend to rise with increases in adult survival and the anticipation of longer periods of retirement, especially in countries where policies and institutions deter people from working past their early or mid-60s.

The demographic dividend is a window of opportunity for rapid growth of income and poverty reduction. It can be catalyzed through policies and programs that lower infant and child mortality and accelerated by encouraging lower

Chart 4

Moving on up

As a large youth cohort gets older, its age wave works its way through the population pyramid from the young base to the middle and ultimately to the peak ages.



Source: United Nations, Department of Economic and Social Affairs, Population Division (2014).

fertility—for example, by broadening access to primary and reproductive health services and to girls' education. But a demographic dividend is not automatic. Its realization depends on key aspects of the economic and legal environment such as the quality of governance, macroeconomic management, trade policy, and infrastructure; the efficiency of labor and financial markets; and rates of public and private investment in health, education, and training.

Demographic dividends have been enjoyed by a number of countries in recent decades, most notably the east Asian tigers (Hong Kong SAR, South Korea, Singapore, and Taiwan Province of China), which cut their birthrates precipitously in the 1960s and 1970s and used the economic breathing room to stunning advantage through judicious education and health policies, sound macroeconomic management, and careful engagement with regional and world economies. In these countries, more than 2 percentage points of annual growth in income per capita (roughly one-third of the total) is attributable to falling fertility and the corresponding sharp rise in the working-age share of the population between 1965 and 2000.

At the other end of the spectrum, countries in sub-Saharan Africa have fared much worse developmentally because they have been unable to escape the crushing burden of youth dependency and rapid population growth. High dependency ratios throughout much of Africa suggest that lower fertility has much potential to spur higher rates of economic growth.

In south Asia, where fertility rates have already fallen substantially, demographic dividends are a more near-term prospect and will depend importantly on human capital investments and job creation.

Ebb and flow in the youth bulge—Long-term economic well-being is powerfully connected to the near-term experience of adolescents and young adults. Along with their sheer number, the skills, habits, energy, and expectations of young people make them a potent agent of social and economic

progress. The persistence of high unemployment rates—especially among the young—continues to undermine the formation of fruitful and stable connections between young people and the world of work. The Arab Spring at the beginning of this decade serves as a sobering reminder that populations with large numbers of adolescents and young adults pose great risk to social and political stability in societies that fail to satisfy people's expectations for standards of living, especially in nondemocratic settings.

These demographic pressures, however, may soon be relaxed. Adolescents and young adults currently represent 16 percent of world population—ranging from lows of 9 percent in Spain and 10 percent in Bulgaria, Italy, Japan, and Slovenia to 24 percent in Micronesia and 23 percent in Lesotho and Swaziland.

But the share is falling in every region, and in some countries even the absolute number of 15- to 24-year-olds is shrinking. By 2020, the largest absolute declines will occur in China (32 million), Vietnam (2.3 million), Russia (1.8 million), Iran (1.7 million), and the United States (1.4 million). The largest percent declines will be in Armenia (–25 percent), Moldova (–24 percent), and Georgia (–23 percent). Other notable cases include South Korea (–15 percent), Cuba (–8 percent), Germany (–7 percent), the United Kingdom (–6 percent), Japan (–4 percent), and South Africa (–3 percent).

This suggests the possibility of better educational and economic opportunities. But the shrinking number of young people also has other implications, including the prospect of fewer workers to support swelling numbers of older people. The younger workers will face growing physical and financial responsibilities to support the elderly, including higher taxes to fund health care and pension spending in pay-as-you go systems. The situation will be further complicated by a swing in electoral power, from increasingly burdened young and prime-age adults to growing numbers of elderly dependents.

Global graying—In a 2009 survey, professional demographers said that aging is the greatest population issue the world will face in the next 20 years (except for African-based demographers, who ranked HIV/AIDS higher).

In 1950, 8 percent of the world's population was classified as old (that is, age 60 or over). Since then, the old-age share of world population has risen gradually to 12 percent today, about 900 million people. But a sharp change is afoot. By 2050 about 2.1 billion people, 22 percent of global population, will be older than 60. The United Nations projects that the global median age will increase from about 30 years today to 36 years in 2050 and that, with the exception of Niger, the proportion of elderly will grow in every country.

Japan's median age of 47 is the world's highest and is projected to rise to 53 by 2050. But by then South Korea's median age will be 54. In 2050, 34 countries will have median ages at or above Japan's current 47. The world's 15- to 24-year-olds now outnumber those ages 60 and above by 32 percent. But by 2026 these two groups will be equal in size. After that, those over age 60 will rapidly come to outnumber adolescents and young adults. This crossover already took place in 1984 among advanced economies and is projected to occur in 2035 in less-developed regions.

Undesirable effects

There is great concern over rapid population aging, which has been crudely linked to many undesirable phenomena, such as workforce shortages, economic growth slowdowns, asset

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market meltdowns, fiscal stress, the financial collapse of pension and health care systems, and the dissipation of demographic dividends.

But demographic change often spurs offsetting behavioral adjustments and technological and institutional innovations. Dire predictions abounded when world population was doubling from 3 to 6 billion between 1960 and 2000. But global income per capita more than doubled during those four decades, life expectancy increased by more than 15 years, and primary school enrollment rates approached universality in many countries.

Population aging is likely to provoke similar adjustments. Myriad strategies are available to realize the potential that increased longevity creates for gains in welfare and to deflect the burdens.

One set of strategies relies on the increased savings and greater female labor force participation that follow lower fertility, possibly abetted by the adoption of policies that make it easier to combine work and family. Another involves magnifying the effective size of the labor force through strong investments in child health and in educational attainment and quality. Businesses can also help by reforming human

resources practices to make workplaces friendlier for older workers and by expanding opportunities for workers of all ages to augment and sharpen skill sets. Other buffers against the effects of an elderly population are likely to include the development of technology such as "social robots" that assist people with vital physical and cognitive activities and the redesign of cities to foster more active and healthier aging. Adjusting coverage and contribution rates and benefit payouts from public health care and pension systems is also a natural response to the fiscal pressures associated with population aging, although it risks provoking intergenerational tensions.

Increasing the statutory retirement age can be a potent response to labor-market tightening associated with population aging. Retirement ages have been remarkably stable for decades, even in the face of dramatic increases in longevity. Projected declines in the ratio of the working-age to non-working-age populations are much less sharp if the upper bound of the working age is increased to 70 over the next quarter century.

Of course, adding older adults to the workforce is useful only if they are healthy enough to be productive. A heightened focus on disease prevention could play an important role in adapting to population aging. That involves a commitment to healthier diets, more physical activity, reduction of tobacco and harmful alcohol consumption, and increased adult vaccinations against diseases such as influenza, pneumococcal pneumonia, and shingles.

Some have also proposed fostering increased rates of international migration from countries with "young" populations, such as those in Africa, to those with "old" populations, such as in Europe, as another adaptation to population aging. Turning on the international migration tap as a response to population aging is possible, but is unlikely to offer appreciable relief given social and political opposition to sustained mass immigration in most high-income countries

A way forward

The world continues to experience the most significant demographic transformation in human history. Changes in longevity and fertility, together with urbanization and migration, are powerful shapers of our demographic future, and they presage significant social, political, economic, and environmental consequences. The challenges are formidable, though likely surmountable. Behavioral adjustments, technological innovations, and policy and institutional changes have significant potential to offset negative consequences and realize promising opportunities, but their implementation will require financial resources and strong national and global leadership. It is unlikely that the worst fears associated with rapid population growth and graying populations will be realized. But a great deal of analysis, debate, behavioral adaptation, and policy reform—in both the public and private spheres—must occur before we can be sure. ■

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