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BY **JASON BREMNER, CARL HAUB, MARLENE LEE, MARK MATHER,** AND **ERIC ZUEHLKE**

WORLD POPULATION HIGHLIGHTS: KEY FINDINGS FROM PRB'S 2009 WORLD POPULATION DATA SHEET

VOL. 64, NO. 3

SEPTEMBER 2009

www.prb.org

POPULATION REFERENCE BUREAU

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The *Population Bulletin* is published four times a year and distributed to members of the Population Reference Bureau. *Population Bulletins* are also available for $7 each (discounts for bulk orders). To become a PRB member or to order PRB materials, contact PRB, 1875 Connecticut Ave., NW, Suite 520, Washington, DC 20009-5728; Tel.: 800-877-9881; Fax: 202-328-3937; E-mail: popref@prb.org; Website: www.prb.org.

The suggested citation, if you quote from this publication, is:
PRB staff, "World Population Highlights: Key Findings From PRB's *2009 World Population Data Sheet*," *Population Bulletin* 64, no. 3 (2009). For permission to reproduce portions from the *Population Bulletin*, write to PRB, Attn: Permissions; or e-mail: popref@prb.org.

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Funding for this *Population Bulletin* was provided through the generosity of the William and Flora Hewlett Foundation, and the David and Lucile Packard Foundation.

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WORLD POPULATION HIGHLIGHTS

KEY FINDINGS FROM PRB'S 2009 WORLD POPULATION DATA SHEET

BY **JASON BREMNER, CARL HAUB, MARLENE LEE, MARK MATHER,** AND **ERIC ZUEHLKE**

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POPULATION REFERENCE BUREAU

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WORLD POPULATION

The United States has maintained robust population growth, resulting from natural increase and from net immigration of about 1 million per year.

BETWEEN 2009 & 2050,
the population of Africa is projected to double.

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97%
Almost all population growth over the next 40 years will be in developing countries.

Fertility rates have fallen in every major world region. Worldwide, the average number of children per woman fell from 5.0 around 1950 to 2.6 in 2009.

Population change will shape the prospects of regions and countries over the next half century. Future population growth will be almost entirely in the developing world, with the fastest growth in the poorest countries and regions.

During the 20th century, nearly 90 percent of population growth took place in countries classified as less developed (LDCs) by the United Nations—all countries in Africa, Asia (except Japan), Latin America and the Caribbean, and Oceania (except Australia and New Zealand). This remarkable development resulted from an unprecedented decline in death rates in LDCs brought about by the spread of public health measures, health care, and disease prevention, particularly after the end of World War II in 1945. These improvements evolved over centuries in the more developed countries (MDCs), but the LDCs were able to benefit from them much more quickly.

The geographic imbalance in population growth seen over the last century will only intensify in the years to come. Between 2009 and 2050, virtually all population growth will take place in the LDCs. The small amount of population growth projected for MDCs will be largely accounted for by the United States and Canada. In many MDCs, most growth will likely be due to immigration from LDCs. In the United States, however, natural increase (births minus deaths) still accounts for more than 50 percent of annual population growth. While the LDCs are projected to increase from 5.6 billion in 2009 to 8.1 billion in 2050, the MDCs are projected to grow from 1.2 billion to just 1.3 billion.

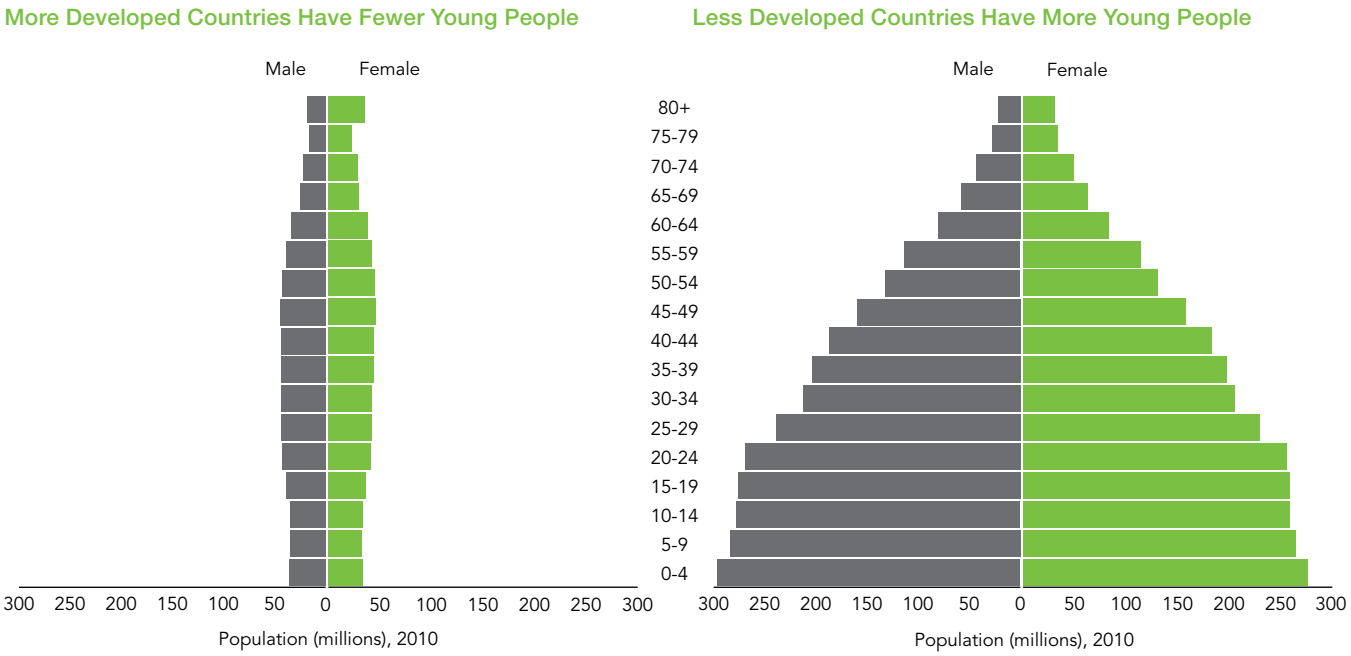
Regional Population Growth

Africa is the region with both the highest birth rates and the largest percentage of population growth projected for 2050. The continent's current population of nearly 1 billion is projected to double in size by 2050. Even after declines, Africa's birth rates remain quite high and its population is very young, with 43 percent of sub-Saharan Africa's population below the age of 15.

Growth of the mainly Arab countries of the Middle East and North Africa has slowed as a result of major changes in marriage and childbearing in recent decades. While a young population structure ensures momentum for future growth, the pace has slackened thanks to fertility declines in some of the region's largest countries. The decline started first in Lebanon, then in Egypt, Iran, and Tunisia. These last three countries were among the first to adopt policies to lower fertility as a way to slow population growth. Delayed marriage and wider acceptance of and access to family planning services in recent decades have hastened decline in fertility and have been accompanied by increased education of girls and young women. In Iran, for example, the average age of marriage for women in 1966 was 18 years old and by 2006, the average age had increased to 23 years.

The population of Latin American and the Caribbean is 580 million, and is projected to increase to 724 million by 2050, a relatively modest increase of 25 percent when compared with Africa. Latin America and the Caribbean now has a regional total fertility rate (TFR) of 2.3. The most populous country in the region, Brazil, has a TFR of 2.0. The TFRs of the next three most-populous countries are Mexico at 2.3 and Colombia and Argentina at 2.4. Other countries in the region, such as Cuba, Chile, Costa Rica, Puerto Rico, and Trinidad and Tobago, have

FIGURE 1



Source: UN Population Division, *World Population Prospects: The 2008 Revision* (2009).

TFRs at or below the replacement rate of 2.1 children per woman. These low rates mean that the region's TFR may well decline to replacement level.

Asia is projected to add the most people by mid-century, with an increase of 1.3 billion over its 2009 population of 4 billion. This population growth is anticipated despite substantial declines in birth rates in many Asian countries. Today, China and India account for nearly two-thirds of the region's population, and in 2050 their share will only be slightly less. But it will be India that will grow substantially by 2050. China's population size will decline well before 2050 if current projections hold true. Should China change its "one-child" policy, a different picture could emerge.

Asia is also home to several other countries with very low TFRs. Taiwan currently has the world's lowest, at 1.0 children per woman, while South Korea has a TFR of 1.2. These countries have expressed concern over population decline and extreme aging in their societies. In Japan, the official population projection anticipates that 40 percent of the population could be 65 and older by 2050.

Extremely low birth rates in most of Europe have fueled concerns about population decline. Europe's 2009 population of 738 million is projected to decline to 702 million by 2050 because of its low country-level TFRs and in spite of continuing net immigration. The decline, however, is expected to take place primarily in eastern and southern Europe. Eastern Europe's 2009 population of 295 million is projected to decrease to 243 million by mid-century, while southern Europe is projected to decrease from 155 million to 151 million. The lowest TFRs are found in eastern European countries, with an average of 1.4 children per woman. The low rates concern policymakers within the region because the rates produce an older age structure and population decline over the long term, even with immigration. Europe, which already has nine of the world's 10 oldest countries, will see its populations continue to age to unprecedented levels over the next 25 years.

Canada and the United States, along with Australia and New Zealand, have maintained relatively robust population growth and thus are different from the MDCs of Europe. U.S. population growth results from natural increase and from net immigration of about 1 million per year. Between 2007 and 2008, immigration accounted for 32 percent of U.S. population growth. The TFR in the United States, 2.1, is high for an MDC, in part because of higher fertility among the growing U.S. Hispanic population, whose TFR is 3.0. But even the TFR of the traditional "majority" population, white non-Hispanics, is 1.9, similar to the highest fertility countries of Europe. With a TFR of 1.6, much of Canada's growth stems from immigration, which, at about 276,000 per year is more than twice the natural increase of 127,000. Immigration is expected to propel the U.S. population total from 307 million today to 439 million by 2050. Along with this growth, the racial and ethnic profile of Americans will continue to shift — with non-Hispanic whites losing their majority status.

Fertility

Fertility rates have fallen in every major world region, but in some regions the rate remains quite high. Globally, the average number of children per woman fell from 5.0 around 1950 to 2.6 in 2009.

TABLE 1

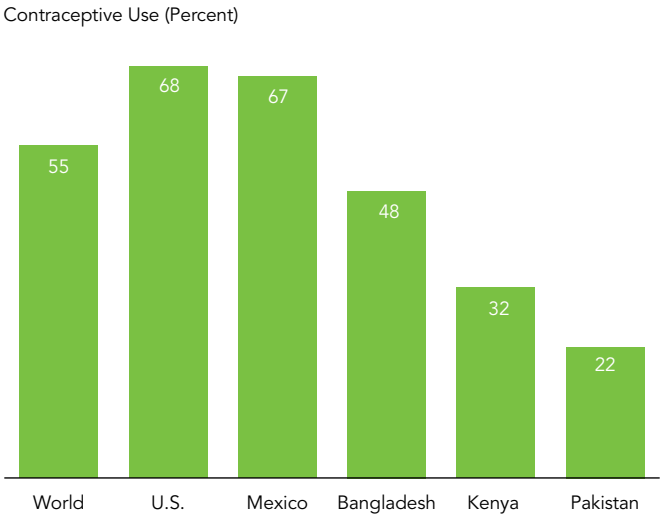
African Countries Have the Youngest Median Age

YOUNGEST	MEDIAN AGE (2009)	OLDEST	MEDIAN AGE (2009)
Niger	15.1	Japan	44.4
Uganda	15.5	Germany	43.9
Dem. Rep. of Congo	16.5	Italy	43.0
Burkina Faso	16.7	Finland	41.8
Zambia	16.8	Channel Islands	41.7

Source: UN Population Division, *World Population Prospects: The 2008 Revision* (2009).

FIGURE 2

The Use of Modern Contraceptives Among Married Women of Childbearing Age Remains Low in Some Countries



Source: Carl Haub and Mary Mederios Kent, *2009 World Population Data Sheet*.

Sub-Saharan Africa has the highest average at 5.3, falling from 6.7 around 1950.

Worldwide, the use of contraception rose from less than 10 percent for married women of childbearing age in the 1960s to 62 percent in 2009. Again, regional variations provide stark contrasts. In Africa, 28 percent of married women use contraception; in Latin America, the share is 71 percent; North America, 73 percent; Europe, 68 percent; and Asia, 67 percent.

CASE IN POINT

U.S. Teen Fertility

The United States has higher teen fertility rates than other developed countries of the world: Girls ages 15 to 19 have fertility rates more than five times higher than their counterparts in France, Italy, Japan, Slovenia, and Switzerland. Nonetheless, the fertility rate of U.S. girls ages 15 to 19 declined every year from 1991 to 2005. During this period, the fertility rate for this age group dropped by one-third, from 61.8 births per 1,000 girls ages 15 to 19 in 1991 to 40.5 in 2005. However, the latest data show the fertility rate in 2007 inching up toward 42.5, suggesting a potential reversal of this trend. This trend is of great concern because teenage pregnancy in the United States has been associated with high-risk pregnancy, infant mortality, lower educational achievement, unemployment, and poverty.

In recent years, there has been a modest increase in European fertility. One of the largest increases has been in Sweden, where the TFR rose from 1.5 in 1999 to 1.9 in 2006. Additional increases have been noted in Bulgaria, the Czech Republic, Estonia, Finland, France, Italy, Latvia, Spain, Ukraine, and the United Kingdom. While some of these countries' TFRs are still quite low, there is evidence of a modest "rebound" in recent years. Generally, countries that offer support to couples for paid parental leave and child care have seen increases in fertility rates. However, some of the increases in fertility have been due to births among immigrants. Notably, many recent European immigrants arrive from elsewhere in Europe, particularly from eastern European countries recently admitted to the European Union.

Data on Muslim women's birthrates in Europe point to sharp reductions in their fertility. These declines in fertility among Muslim immigrants reflect cultural and social shifts in these communities toward universal female education, rising living standards, adoption of local attitudes, and availability of contraception. In general, immigrant birth rates tend to rise or fall to the local levels in a couple of generations.

Mortality

The phenomenal increase in world population in the 20th century resulted from plummeting mortality rates, primarily in LDCs. Advances in health and medicine that had taken many centuries to achieve in the developed countries spread quickly among developing countries. Even with the high death rates from HIV/AIDS, mortality has declined enough to fuel rapid population growth.

In most countries, many of the early gains in life expectancy have been a consequence of declines in infant and child mortality. These declines were the result of improved sanitation and medical interventions such as vaccinations and antibiotics over the last two centuries.

CASE IN POINT

Russian Mortality

With the spread of HIV/AIDS and alcoholism and the deterioration of the Russian health care system, male mortality in Russia is over three times higher than in other countries at a similar stage of development. Female mortality is only slightly better at twice the rate of other comparable countries. A demographic decline of this scale is usually the result of a major war.

For the first few decades of its existence, the Soviet Union enjoyed a remarkable improvement in health conditions, despite civil wars, internal repression, and World War II. By the early 1960s, Russian life expectancy had caught up with that of the United States. During the 1960s, however, life expectancy in the United States rose rapidly, while life expectancy in the Soviet Union declined. The gap between the two countries in life expectancy grew steadily wider. Life expectancy for men fell abruptly from a high of 65 years in 1987 to a low of 57 years in 1994, and then rebounded to 61 years in 1998. However, Russian male and female life expectancy, 61 and 74 years respectively, has improved little since the end of the 20th century.

More recent gains in life expectancy and projected gains, however, are mostly associated with reduced death rates at middle and older ages.

Not all countries have experienced the same gains in life expectancy. In high-mortality, low-income countries, deaths of children make up a large fraction of all deaths. In low-mortality, high-income countries, the elderly account for most deaths. Accordingly, elimination of childhood infectious diseases has the greatest effect on reducing mortality in poor countries, and treatments for adult conditions have the greatest effect in rich countries.

Migration

Most of the world's 191 million international migrants are concentrated in a relatively small number of countries in North America, Europe, and the former Soviet Union. In 2005, the United States was home to more foreign-born residents than any other country, 38 million, or one of every five immigrants worldwide. Russia was second, with 12 million immigrants, and Germany was third with 10 million.

Globalization, uneven population growth, and economic differences across countries have increased the flow of people across national borders. In 1960, there were only 30 countries with half a million immigrants or more; by 2005, the number had more than doubled to 64. The largest flow of in-migrants is from less developed to more developed countries (62 million in 2005), but there are almost as many (61 million) who move from one developing country to another. Many of these "south-south" migrants are moving for work opportunities. Others have moved to escape conflict or natural disasters. Refugee migration is most common in Africa, which has one-seventh of the world's population but one-fourth of the world's 10 million refugees.

The impact of migrants on receiving countries depends in part on the relative size of the foreign-born population. In the United States, foreign-born residents account for roughly 13 percent of the total population, but in some countries with high labor needs, the proportions are much higher. In the Persian Gulf states, which have long relied on migrant workers from South Asia to fill private-sector jobs, more than one in three residents were foreign born in 2005.

Africa has also experienced large migration flows in recent decades, often in response to natural disasters, economic problems, or civil unrest. In 1994, Africa witnessed one of the world's largest refugee movements in recent times, as 2 million Rwandans left their country, straining local infrastructures, contributing to the spread of infectious diseases, and upsetting ethnic balances in neighboring countries.

Emigration can help relieve population pressures and reduce unemployment in migrant-sending countries. Migrant workers also send billions of dollars home to their countries of origin. These remittances are larger than the total of all official development assistance worldwide, and are among the fastest-growing international financial flows. Although migrant-sending countries benefit from remittances from those who left, they also lose some of their most industrious workers. In parts of the Caribbean, 70 percent of the highly educated work force has left to work in Canada, the United States, or Europe. Some highly skilled workers do return to their home countries, but these return rates vary widely by country. Return rates have been relatively high in China and South Korea, boosting economic development. India has had relatively low return rates, but this could change if the United States continues to shift white-collar jobs overseas, creating new local job opportunities for returning high-skilled workers.

TABLE 2

One in Five International Migrants Lives in the United States

COUNTRY	PERCENTAGE OF INTERNATIONAL MIGRANTS
United States	20.2
Russia	6.4
Germany	5.3
Ukraine	3.6
France	3.4

Source: UN Population Division, *Trends in Total Migrant Stock: The 2005 Revision* (2006).

YOUTH

Young women are two to almost five times more likely to be infected with HIV than young men in some countries.

1.1 BILLION

The number of youth living in less developed countries.

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45%

The share of youth among those ages 15 or older who were newly infected with HIV in 2007.

As fertility rates decline and young populations grow older in many developing countries, a bulge in the working-age population with fewer children and elderly to support may provide benefits.

About one in five people, over 1.2 billion people, are between the ages of 15 and 24. The United Nations estimates the world's median age to be 28.9. By 2050, it is projected to be 38.4.

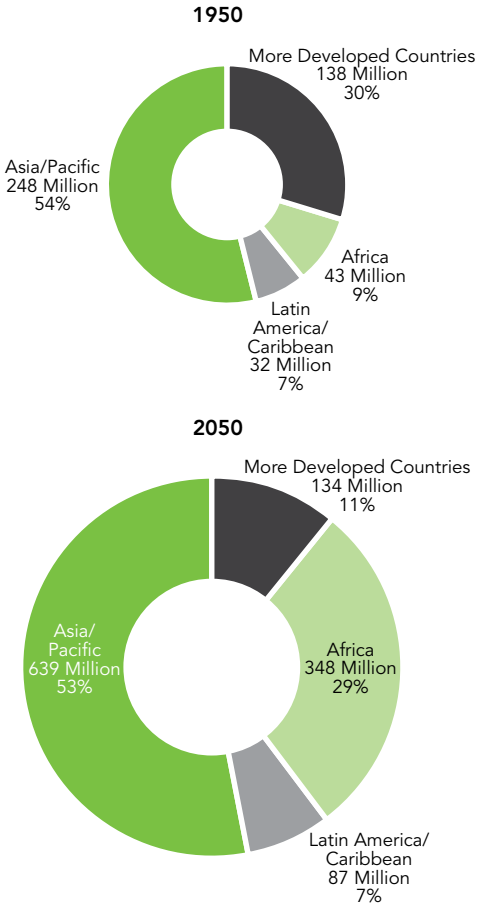
Although the world is aging, the proportion of the population between 15 and 24 in LDCs will continue to be higher than in MDCs. In 2005, young people represented 13.7 percent of the MDCs' population, 166 million. That share is expected to drop to 10.5 percent by 2050. The vast majority of the world's youth, 1.1 billion, are in LDCs. Sub-Saharan Africa has the world's most youthful population and is projected to stay that way for decades.

Most developing countries have young populations because of high fertility and improvements in child survival. But as fertility rates decline and young populations grow older in many LDCs, a bulge in the working-age population with fewer children and elderly to support may provide benefits. This "demographic dividend" can bring improvements in society by allowing more investments in education, technology, and skills to support a growing economy; encourage more targeted investment in health care; and increase economic output because more people are working. With the right investments in health, education, rural agricultural development, entrepreneurship, and training, a large youth population can be an opportunity for development and economic growth.

However, without educational opportunities and a strong economy with healthy labor markets, the youth bulge can be problematic. The lack of job opportunities for youth in many countries breeds frustration. Recent unrest in Greece, Iran, France, and China has all been at least partly due to a lack of opportunities for young people. Some youth with few job prospects and little hope of future advancement may resort to criminal activities or join one side or another of armed conflicts.

FIGURE 3

The Share of the World's Youth Population Is Growing in Africa and Shrinking in MDCs



Source: UN Population Division, *World Population Prospects: The 2008 Revision* (2009).

Educational opportunities are unavailable to tens of millions of young people. Worldwide, less than 60 percent of youth attend secondary school and less than 30 percent of youth attend secondary school in sub-Saharan Africa. In addition, HIV/AIDS and continued high fertility in many African countries present interrelated challenges for young people.

HIV/AIDS and Young People

The percentage of young people living with HIV in many countries has declined, significantly in some. Among those ages 15 to 24, male prevalence is estimated to be 0.4 percent, and female prevalence is 0.6 percent worldwide. However, in 2007, youth accounted for many of the new HIV cases—45 percent of all those newly infected with HIV at ages 15 and older were between the ages of 15 and 24.

In the United States, the number of young people diagnosed with HIV each year is relatively low, but has risen from 2003 to 2007. In 2003, 1,879 men and women ages 15 to 24 were diagnosed with HIV. In 2007, that number was 2,382. As of 2007, 157,000 young men and 64,000 young women were HIV positive in the United States. Washington, D.C., has one of the highest rates of AIDS prevalence in the country. Almost 1,000 13-to-24-year-olds were diagnosed with HIV between 1984 and 2005 in Washington, D.C., and the number almost tripled between 2000 and 2005. Approximately one in 100 young people ages 13 to 24 in Washington, D.C., is HIV positive.

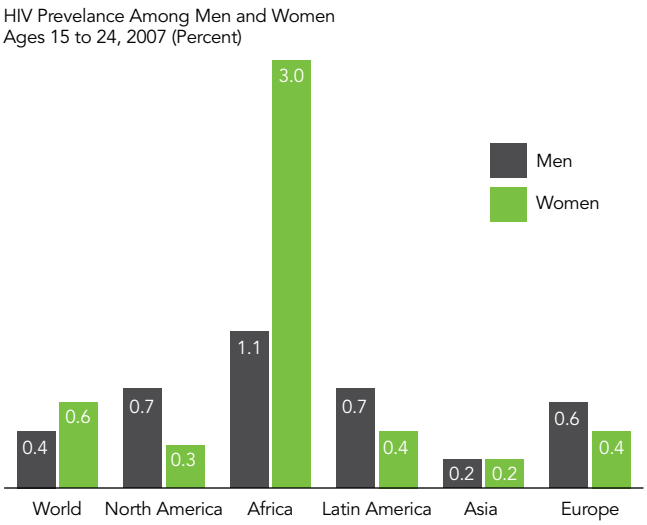
HIV spreads fastest among vulnerable populations living in poverty without access to education and health services that can mitigate transmission. Lack of knowledge of which behaviors can prevent HIV infection is widespread among some populations. HIV still carries social stigma and HIV testing is rare among young men and women. The fact that so many young people in poverty become infected with HIV each year reinforces the need for education and employment opportunities that can change behavior and economic circumstances.

In sub-Saharan Africa, young women are disproportionately affected by HIV. According to UNICEF, young women are two to almost five times more likely to be infected than young men in some countries. In Swaziland, for example, 6 percent of young men and 23 percent of young women were living with HIV in 2007. A UNICEF and ICF Macro analysis in 2008 of data from Cameroon, Swaziland, Uganda, Tanzania, and Zimbabwe found that young women with multiple sexual partners and women with older partners were more likely to be infected with HIV. Intergenerational sex, transactional sex, and gender-based violence make young women especially vulnerable to HIV infection.

Although HIV prevalence rates are higher among young women, high-risk sexual behavior is much more common among young men, especially those in urban areas. Young men are much more likely to have multiple sexual partnerships and engage in higher-risk sex than young women. Gaining access to family planning services and education on reproductive health go hand-in-hand with addressing HIV/AIDS among young people.

FIGURE 4

HIV Prevalence Among Young Men and Women Remains High in Africa and Relatively Low in Asia



Source: Carl Haub and Mary Mederios Kent, *2009 World Population Data Sheet*.

CASE IN POINT

Peer Education to Prevent HIV Transmission

Involving the energy, idealism, and experience of young people is essential to halt the spread of HIV/AIDS. It is estimated that only 30 percent of young men and 19 percent of young women in LDCs have comprehensive knowledge of HIV and how to avoid transmission. Throughout the world, young people have come up with innovative campaigns to educate their peers on how HIV is transmitted, how to prevent infection, and how to avoid unwanted pregnancies. Over 70 LDCs now mandate life-skills education that includes information on HIV in secondary school curricula. These efforts make a difference at local, national, and global levels. In Uganda, the "Enter-Educate" weekly radio show by the Straight Talk Foundation is made by and for young people to reach out to their peers across the country on sexual health. And since the 2000 International AIDS Conference in Barcelona, YouthForce, a coalition of youth and youth-serving organizations, has been speaking up to ensure that young people's issues and participation are represented in the international dialogue.

GENDER

The gender gap in life expectancy has been narrowing in nearly all countries since 1990.

1 IN 75

Women in less developed countries have a high lifetime risk of dying from pregnancy-related causes.

© 2009 Edson E. Whitney, Courtesy of Photoshare

15%

The share of their lives that women live in poor health.

In LDCs, women with a secondary education or higher have one-third to one-half fewer children than women with no formal education.

Since 1950, the greatest gains in life expectancy at birth occurred among women. In more developed countries, average life expectancy for women rose from 69 years in 1950 to 81 years in 2009, while the average for men rose from 64 years to 74 years. Worldwide, men have higher mortality and greater disability than women. In nearly every country, men die at younger ages. However, women spend about 15 percent of their lives in poor health, compared with about 12 percent for men.

Women and Infants

The female health disadvantage stems from risks associated with pregnancy and childbearing and gender bias. Women are disadvantaged from birth in many countries: Girls receive less nutritious food and less medical care, perpetuating a cycle of poor health. Women who are undernourished during pregnancy are more likely to have low birth-weight babies and undernourished children. Women face additional risks associated with childbirth, and maternal mortality is particularly high in sub-Saharan Africa.

Reducing maternal mortality is one of the UN's Millennium Development Goals. Worldwide, one in 92 women are estimated to have a lifetime risk of dying from pregnancy-related causes, but the gap between MDCs and LDCs is great. In the MDCs, the risk is one in 6,000, and in the LDCs, one in 75. The danger is greatest in sub-Saharan Africa, where one in 22 women have a lifetime risk of dying from such causes. Maternal mortality is linked to such factors as the frequency and type of prenatal care and the type of attendants at birth. High levels of mortality can be prevented with proper care and facilities, services that are frequently lacking in LDCs.

A large body of research has linked education for women and girls with lower birth rates. Indeed, recent data from many LDCs have shown that women with at least a secondary-level education eventually give birth to one-third to one-half as many children as women with no formal education. In some of these countries, the fertility of these better-educated women approaches replacement level (2.1 children per woman). Better-educated women generally are able to exercise more control over their reproductive lives, including delaying marriage and childbearing. Delayed childbearing and more time between births improve infant and child outcomes.

Young Women and Unmet Need for Family Planning

Fertility rates among women ages 15 to 24 vary widely across regions. The United States has the highest teenage fertility rate in the developed world and 82 percent of U.S. teen pregnancies are unplanned. After declining from 1991 to 2005, the fertility rate among girls ages 15 to 19 in the United States has increased to 42 births per 1,000 girls, according to 2006 data. In Africa, for girls ages 15 to 19, the rate is 118 births per 1,000 girls and 237 births per 1,000 women ages 20 to

24. In Europe, the rate is much lower, at 17 per 1,000 girls ages 15 to 19 and 65 births per 1,000 women ages 20 to 24. The reason for the divergence is not because young women in Africa, Latin America, and Asia want to have more children than young women in other regions; the skewed ratios reflect an unmet need for family planning.

According to a study of Demographic and Health Surveys from 38 developing countries, sexually active, young unmarried women are more likely to report an unmet need for contraceptives than young married women. In many countries, the percentage of girls ages 15 to 19 giving birth each year has declined, but not significantly. Pregnancy among girls ages 15 to 19 is more common in sub-Saharan Africa and Latin America and the Caribbean than in South and Southeast Asia.

Adolescent girls with less education who are living in rural areas are more likely to be pregnant. Education for young women is a key component to addressing unmet need for family planning. Girls' education has been proven to improve the quality of life of families and lower fertility rates. School-based sex education can also lead to more healthy attitudes, mitigating risky behavior that puts girls at risk for pregnancy and HIV infection. HIV prevention efforts can be linked to family planning programs to reduce unintended pregnancies and ensure the health of young women and men.

The Life Expectancy Gap

While females live longer than men, the gender gap in life expectancy has been narrowing in nearly all countries since 1990. However, advances in life expectancy have not been made equally across the globe. Economic and social disruptions can slow or even reverse progress for subsets of the population. For example, war-torn Georgia has a life expectancy gap of eight years (79 for females vs. 71 for males). The political and social transition in central and eastern Europe has also been associated with widening educational differences in life expectancy. Among those countries with the largest male-female differences in life expectancy at birth are the eastern European and Baltic countries of Belarus, Estonia, Latvia, Lithuania, and Ukraine.

Factors that influence gender differences in mortality include biological factors such as hormonal influences on physiology and behavior, and environmental factors such as cultural influences on gender differences in health behaviors. In MDCs, men's risky unhealthy behaviors are a major reason they die younger. Their higher rates of cigarette smoking, heavy drinking, gun use, employment in hazardous occupations, and risk-taking in recreation and driving are responsible for higher death rates from lung cancer, accidents, suicide, and homicide than the death rates for women.

Men's risky behaviors also contribute to their having higher mortality rates, but in LDCs the gender gap in mortality has been smaller than in MDCs. Environmental factors such as unsafe water and inadequate nutrition increase the death rate due to infectious diseases for both sexes.

Another reason for the smaller gender gap in mortality in LDCs is because women have much lower social status than men in many of these countries. As women's status catches up with men's, the gender gap is expected to increase. But in MDCs, the gender gap is expected to decrease as women adopt unhealthy behaviors similar to men's—more drinking and smoking, and more job-related stress.

CASE IN POINT

Pakistan's Infant Mortality

Data from Pakistan suggest that some progress in child and maternal health was made between the 1990-1991 and 2006-2007 rounds of the Demographic and Health Surveys. By 2007, nearly half of infants (47 percent) had been immunized with five recommended childhood vaccinations by age 12 months. In 1990, only 22 percent received the recommended vaccines. And by 2007, most mothers surveyed (61 percent) had at least one antenatal care visit with a health professional, up from 30 percent. One in three babies were delivered at a health facility by 2007, up from 13 percent in 1990-1991. But much still needs to be done. While the infant mortality rate dropped from 91 infant deaths per 1,000 live births to 78 deaths per 1,000 between 1990 and 2007, it is still high by world standards. Pakistan's infant mortality rate is well above the world average of 52 infant deaths per 1,000 live births and the infant mortality rate of 57 in all less developed countries. The average infant mortality rate is 6 deaths in more developed countries.

ENVIRONMENT

Population aging may decrease the production of carbon emissions in the United States and China.

IN THE **1990s,**

human activities resulted in the deforestation of an area roughly the size of Colombia and Ecuador combined.

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20%

Land use change is responsible for a substantial proportion of human-induced carbon emissions.

Small households consume more energy per capita than large households. And in many parts of the world, average household size is decreasing.

The widespread use of fossil fuels such as oil and coal has led to the release of enormous amounts of heat-absorbing gases into the atmosphere.

The four greenhouse gases whose atmospheric concentrations are most influenced by human activities are:

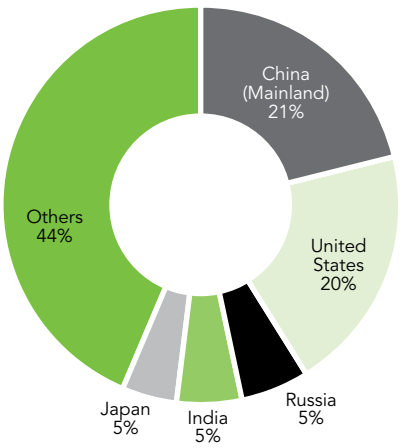
- Carbon dioxide, or CO2, produced by burning solid waste, wood and wood products, and fossil fuels such as oil, natural gas, and coal.
- Methane, emitted by livestock or by the decomposition of organic wastes in municipal solid waste landfills.
- Nitrous oxide, generated by the combustion of fossil fuels and solid waste.
- Chlorofluorocarbons, also called CFCs, manufactured by industry for use in coolants and insulation.

Atmospheric concentrations of carbon dioxide remained between 260 to 280 parts per million (ppm) for the 10,000 years prior to the industrial revolution. Since 1750, human activity has increased the concentration of carbon dioxide in the atmosphere, and current concentrations are 150 percent of preindustrial levels, or 384ppm.

Population growth is one root cause of increases in global greenhouse gas emissions. But the complexity of the mechanisms through which demographic factors affect emissions is not fully taken into consideration in many analyses that influence governments' climate change mitigation efforts. For example, reports by the Intergovernmental Panel on Climate Change include future scenarios where each member of the population is assumed to contribute equally to emissions; thus, population growth affects emissions. It is well known, however, that levels of greenhouse gas emissions depend on consumption and production patterns and that these patterns vary across populations. Changes in the composition of populations will affect global greenhouse gas emissions. Better climate change scenarios also depend on knowing how population composition will change over time.

FIGURE 5

The Top Five Emitters of CO2 Accounted for More Than Half of CO2 Emissions in 2006



Source: International Energy Agency, *Key World Energy Statistics 2008* (2009).

Research on population and climate change has identified three demographic trends that will affect global emissions: urbanization, declining household size, and population aging.

Urbanization

In 2007, for the first time in history, more than 50 percent of the world's population lived in urban areas. MDCs are already highly urbanized with 75 percent of their populations living in urban areas. But in LDCs, medium and small urban areas are growing rapidly. In fact, in the coming 40 years almost all of the world's population growth will occur in urban areas of LDCs. Urbanization leads to higher emissions principally from higher per capita fossil fuel consumption.

Declining Household Size

Studies have shown that the number of households is more important than the number of individuals in determining emissions. Demographic trends indicate that as population grows in many parts of the world, average household size is decreasing. Thus, an increasing number of households have fewer members per household. Research indicates that the energy consumption of small households per capita is substantially higher than large households. Much of the energy consumption of a household is fixed and depends more upon the actual size of a dwelling and the number of vehicles per household than the number of members in the household.

Population Aging

Among the MDCs, populations are aging as older adults make up an increasing proportion of many nations. This trend is also beginning in LDCs such as Brazil and China that have exhibited recent rapid declines in fertility. Research on the United States and China suggests that aging will contribute to a decrease in emissions as the proportion of the population participating in the labor force decreases over time.

The Future

Per capita emissions give us a limited perspective on potential emissions growth. Understanding differences in emissions between groups in a population as well as how demographic changes will result in changes in the proportions of each group over time gives a better understanding of each country's role in contributing to climate change. While population growth contributes to emissions, the world's two largest emitters, China and the United States, account for 41 percent of global emissions, but also have slow population growth. Significant reductions in their emissions will depend largely on policy and technology.

CASE IN POINT

Deforestation and Carbon Emissions

The CO2 emissions data in the figure on page 10 do not take into account land-use change and thus may actually underestimate the contribution of LDCs to climate change. As trees grow, they absorb carbon from the atmosphere and store it in their tissues. When forests are cleared or burned, this carbon is released back into the atmosphere as carbon dioxide, which traps the sun's energy and raises global temperatures. Forests contain 40 percent of all stored carbon, more than any other terrestrial ecosystem, and thus help buffer against global warming. The Intergovernmental Panel on Climate Change, a UN-sponsored consortium of leading scientists, found that land-use change — of which tropical deforestation is the most significant component — was responsible for roughly 20 percent of human-induced carbon emissions in the 1990s.

A global meta-study of causes of tropical deforestation found that population growth was consistently an underlying factor contributing to forest loss. During the 1990s, human activities resulted in the gross deforestation of an area roughly the size of Colombia and Ecuador combined (146 million hectares, or 563,709 square miles). During that same time period, 52 million hectares were regained due to reforestation efforts and natural regrowth. Rates of net deforestation (gross deforestation less reforestation, natural regrowth, and plantation growth) were highest in South America and Africa, while high rates of gross deforestation in Asia were offset by expanding forest plantations. In general, the 1990s saw forest cover expand in temperate less-developed countries, decline in tropical less-developed countries, and remain relatively stable in more developed countries.

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World Population

Population change will shape the prospects of regions and countries over the next half century. Future population growth will be almost entirely in the developing world, with the fastest growth in the poorest countries and regions.

Youth

About one in five people, over 1.2 billion people, are between the ages of 15 and 24. The United Nations estimates the world's median age to be 28.9. By 2050, it is projected to be 38.4.

Gender

Since 1950, the greatest gains in life expectancy at birth occurred among women. Worldwide, men have higher mortality and greater disability than women. In nearly every country, men die at younger ages. However, women spend about 15 percent of their lives in poor health, compared with about 12 percent for men.

Environment

The widespread use of fossil fuels such as oil and coal has led to the release of enormous amounts of heat-absorbing gases into the atmosphere.

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