United Nations, Department of Economic and Social Affairs, Population Division (2011). *World Population 2010 (Wall Chart)*. ST/ESA/SER.A/307.

[Wall chart caption]

WORLD POPULATION PROSPECTS: THE 2010 REVISION

World population to reach 10 billion by 2100 provided 72 per cent of the population lives in countries with below-replacement fertility by 2050

The current world population of 7 billion is projected to reach 9.3 billion in 2050 and 10.1 billion in 2100 according to the medium variant of the *2010 Revision* of *World Population Prospects*, the official United Nations population projections prepared by the Population Division of the Department of Economic and Social Affairs. Much of this increase is projected to come from the 58 high-fertility countries.

Small variations in fertility can produce major differences in the size of populations over the long run. The high projection variant, whose fertility remains just half a child above that in the medium variant, produces a world population of 10.6 billion in 2050 and 15.8 billion in 2100. The low variant, whose fertility remains half a child below that of the medium, produces a population that reaches 8.1 billion in 2050 and declines towards the second half of this century to reach 6.2 billion in 2100. The population projections to 2050 vary over a narrower range than those to 2100 because people who will be 40 years or older in 2050 have already been born.

The world population still has a high potential to grow by large amounts. According to the medium variant, the eighth billion will be added in just 13 years, the ninth in 18 years and the tenth in 40 years. According to the high variant, an additional billion would be added every 10 or 11 years during most of this century.

Current fertility levels vary markedly among countries. Today, 42 per cent of the world population lives in low-fertility countries, that is, countries where women are not having enough children to ensure that, on average, each woman is replaced by a daughter who survives to the age of procreation. Another 40 per cent lives in intermediate-fertility countries where each woman is having, on average, between 1.0 and 1.5 daughters who will survive to the age of procreation, and the remaining 18 per cent lives in high-fertility countries where women have on average more than 1.5 daughters who will survive to the age of procreation.

High-fertility countries are mostly concentrated in Africa (39 out of the 55 countries in the continent have high fertility), but there are also nine in Asia, six in Oceania and four in Latin America. Low-fertility countries include all countries in Europe except Iceland and Ireland, 19 out of the 51 in Asia, 14 out of the 39 in the Americas, two in Africa (Mauritius and Tunisia) and one in Oceania (Australia). The rest are intermediate-fertility countries.

Countries as varied as China, Brazil, the Russian Federation, Japan, Viet Nam, Germany, the Islamic Republic of Iran, Thailand and France, in order of population size, account for 75 per cent of the population living in low-fertility countries. Three-quarters of the population living in the intermediate-fertility countries is located in India, the United States of America,

Indonesia, Bangladesh, Mexico and Egypt, in order of population size; and Pakistan, Nigeria, the Philippines, Ethiopia, the Democratic Republic of the Congo, the United Republic of Tanzania, Sudan, Kenya, Uganda, Iraq, Afghanistan, Ghana, Yemen, Mozambique and Madagascar, in order of population size, account for 75 per cent of the population of high-fertility countries.

The highest potential for future population growth is in high-fertility countries. Between 2011 and 2100, according to the medium variant, the population of the high-fertility countries would more than triple, passing from 1.2 billion to 4.2 billion. During the same period, the population of the intermediate-fertility countries would increase by just 26 per cent, from 2.8 billion to 3.5 billion, while that of the low-fertility countries would decline by about 20 per cent, from 2.9 billion to 2.4 billion.

Whereas the populations of both the low-fertility countries and the intermediate-fertility countries are projected to peak before the end of the century, that of the high-fertility countries would continue to increase during the whole period. According to the medium variant, the population of the low-fertility countries would reach a maximum around 2030 at 3.1 billion and that of the intermediate-fertility countries would peak around 2065 at 3.8 billion. Among the low-fertility countries, China is expected to see its population reach a maximum around 2030 at 1.4 billion and that of Europe is projected to peak around 2020 at 0.74 billion. Among the intermediate-fertility countries, India's population would peak around 2060 at 1.7 billion.

By the turn of the century, only the population of high-fertility countries would still be increasing. According to the medium variant, in 2095-2100, the populations of both the low-fertility countries and the intermediate-fertility countries would be declining at a rate of approximately 0.3 per cent per year. In sharp contrast, the population of the high-fertility countries would still be increasing at a rate of 0.5 per cent per year.

The realization of these projections hinges on meeting the assumptions made about the future evolution of fertility. In the *2010 Revision*, a probabilistic model was used to derive the future path of fertility in the medium variant. The model assumes an initial distribution of its stochastic component, which is modified later on the basis of information on past fertility trends. In this process, account is taken of past fertility trends in the country whose fertility is being projected plus the past experience of all other countries in the world. The model was used to generate 100,000 trajectories for future fertility for each country and the median values of those trajectories determined the fertility path used in preparing the medium–variant projection. The model incorporated the additional assumption that, over the very long run, fertility levels would converge to 2.1 children per woman, a level which produces on average one daughter who survives to the age of procreation.per woman when mortality is low. At the global level, world fertility reaches replacement level in 2035-2040 in the medium variant and remains below replacement level for the rest of the century.

The future fertility paths in the medium variant differ markedly among the groups of countries classified by fertility level. For high-fertility countries, future fertility in the medium variant drops from 4.9 children per woman in 2005-2010 to 2.8 in 2045-2050 and reaches 2.1 children per woman in 2095-2100, implying that fertility remains above replacement level until 2095. For intermediate-fertility countries, average fertility drops from

2.6 children per woman in 2005-2010 to 1.8 in 2045-2050, reaches a minimum around 2060 and then recuperates slowly to reach 1.9 children per woman in 2095-2100. For low-fertility countries, fertility increases over the projection period rising from 1.6 children per woman in 2005-2010 to 1.8 in 2045-2050 and to 2.0 in 2095-2100. Despite this increase, average fertility in the low-fertility countries remains below replacement level over the whole projection period.

Small differences in fertility levels sustained over long periods have a major impact on the future size of the population. The low and high variants differ from the medium variant in that their fertility remains half a child below and half a child above that of the medium variant, respectively, during 2010-2100. As a result, they produce smaller and larger populations than the medium variant and the difference between the two increases over time. In 2050, for instance, the difference between the population projected by the high and low variants for the high-fertility countries amounts to 0.6 billion (2.96 billion vs. 2.32 billion), but by 2100 that difference expands to 3.3 billion (6.1 billion vs. 2.8 billion). Consequently, if the high-fertility countries of today fail to achieve the reductions of fertility projected in the medium variant, they may well see their overall population increase four or five-fold by the turn of the century instead of just tripling. Even with the reductions of fertility projected in the medium variant, the population of 34 of the 58 high-fertility countries would triple by 2100.

For the intermediate-fertility countries, the difference between the population produced by the high and low variants is also large, amounting to 1.1 billion in 2050 (4.3 billion in the high variant vs. 3.2 billion in the low variant) and grows to 3.8 billion in 2100 (5.8 billion vs. 2.0 billion). Although the fertility of the intermediate-fertility countries has dropped markedly since the late 1960s (from 5.3 to 2.6 children per woman in 2005-2010), there is considerable uncertainty about whether all of them will continue to reduce their fertility to below-replacement level, as projected in the medium variant. If fertility for the intermediate-fertility countries remains above replacement level, they might still experience a doubling of their population by 2100, as projected in the high variant. The reduction of population projected by the low variant would result from very deep reductions of fertility, to well below 1.5 children per woman.

For the low-fertility countries, fertility in the medium variant is projected to increase very slowly. This trend is consistent with the upward trend observed in many low-fertility countries in recent years. The future population of low-fertility countries is projected to range between 2.6 billion and 3.3 billion in 2050 and between 1.3 billion and 3.9 billion in 2100. The high values would be reached if the future fertility of low-fertility countries would rise above replacement level while still remaining generally below 2.5 children per woman. The low values would result from maintaining fertility well below 1.6 children per woman from 2010 to 2100. The persistence of very low fertility levels in the low-fertility countries would speed up population ageing and reductions of their populations.

Life expectancy is projected to increase in the three groups of countries considered. In 2005-2010, average life expectancy at birth was lowest among the high-fertility countries, at 56 years, mainly because many of them have generalized HIV/AIDS epidemics. Nevertheless, given the advances made in reducing the spread of the disease and in expanding the coverage of antiretroviral treatment, the projections assume a continued decline in mortality rates from

HIV/AIDS as well as from other major causes of death. Therefore, the expectation of life among high-fertility countries rises to 69 years in 2045-2050 and to 77 in 2095-2100.

Among the intermediate-fertility countries, average life expectancy was 68 years in 2005-2010 and is projected to rise to 77 years in 2045-2050 and to 82 in 2095-2010. Low-fertility countries tend to have, as a group, the highest average life expectancy. It was estimated at 74 years in 2005-2010 and is projected to rise to 80 years in 2045-2050 and to 86 years in 2095-2100. Globally, life expectancy is projected to increase from 68 years in 2005-2010 to 81 in 2095-2100.

Because declining fertility and increasing longevity lead to population ageing, population ageing is fastest in the low-fertility countries. Today, 11 per cent of the population of low-fertility countries is aged 65 years or over and just 34 per cent is under age 25. By 2050, according to the medium variant, 26 per cent of their population will be aged 65 or over and just 24 per cent will be below age 25. However, because fertility is projected to increase over the projection period, by 2100 the proportion under 25 increases to 27 per cent and the proportion aged 65 or over rises by barely 2 percentage points to reach 28 per cent.

Population ageing is slower among the intermediate-fertility countries, but it results in a similar age structure of the population in 2100 as that of the low-fertility countries. The proportion of the population under age 25 passes from 47 per cent in 2010 to 26 per cent in 2100 and the proportion aged 65 or over rises from 6 per cent in 2010 to 26 per cent in 2100.

Population ageing is slowest among the high-fertility countries, which still have a very young population. In 2010, 62 per cent of their population was under age 25 and that proportion is projected to decline markedly to reach 48 per cent in 2050 and 35 per cent in 2100. At the same time, the proportion aged 65 or over is projected to rise from just over 3 per cent in 2010 to 6 per cent in 2050 and to 16 per cent in 2100.

For the full results of *World Population Prospects: The 2010 Revision*, visit www.unpopulation.org