

III. MORTALITY AND THE DEMOGRAPHIC IMPACT OF HIV/AIDS

A. TRENDS AND PROSPECTS IN WORLD MORTALITY

The twentieth century witnessed the most rapid decline in mortality in human history. In 1950-1955, life expectancy at the world level was 47 years and it had reached 68 years by 2005-2010. Over the next 45 years, life expectancy at the global level is expected to rise further to reach 76 years in 2045-2050 (table III.1). The more developed regions already had a high expectation of life in 1950-1955 (66 years) and have since experienced further gains in longevity. By 2005-2010 their life expectancy stood at 77.1 years, 12 years higher than in the less developed regions where the expectation of life at birth was 65.6 years. Although the gap between the two groups is expected to narrow between 2005 and mid-century, in 2045-2050 the more developed regions are still expected to have considerably higher life expectancy at birth than the less developed regions (82.8 years versus 74.3 years).

TABLE III.1. LIFE EXPECTANCY AT BIRTH FOR THE WORLD, MAJOR DEVELOPMENT GROUPS AND MAJOR AREAS, 2005-2010 AND 2045-2050

<i>Major area</i>	<i>2005-2010</i>	<i>2045-2050</i>
World	67.6	75.5
More developed regions	77.1	82.8
Less developed regions	65.6	74.3
Least developed countries	55.9	68.5
Other less developed countries.....	67.7	75.9
Africa	54.1	67.4
Asia	68.9	76.8
Europe	75.1	81.5
Latin America and the Caribbean.....	73.4	79.8
Northern America.....	79.3	83.5
Oceania	76.4	82.1

Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (2009). *World Population Prospects: The 2008 Revision*. New York: United Nations.

The 49 least developed countries, which include 27 of the countries that are highly affected by HIV/AIDS, have been experiencing higher mortality than other development groups. Their life expectancy at birth was 56 years in 2005-2010 and is expected to remain relatively low, reaching 68.5 years in 2045-2050.

The general upward trend in life expectancy for the more developed and the less developed regions (figure 4) conceals different trends among the world's major areas (figure 5). In Asia, Latin America and the Caribbean, Northern America and Oceania, life expectancy has been increasing at a steady pace. In contrast, Europe as a whole experienced a slowdown in the increase of life expectancy starting in the late 1960s and stagnating levels since the late 1980s. This trend is the result of severe reductions in life expectancy in countries of Eastern Europe, particularly in the Russian Federation and the Ukraine. The remaining regions of Europe have had increasing life expectancies which are currently equal to or higher than that of Northern America.

Africa has the lowest life expectancy levels of any major area. Furthermore, life expectancy in Africa has virtually stagnated since the late 1980s. While this trend is due in large part to the HIV/AIDS epidemic, other factors have also played a role, including armed conflict, economic stagnation, and resurgent infectious diseases such as tuberculosis and malaria. The recent negative developments in many countries of Africa represent major set backs in reducing mortality. Only in 2005-2010 is life expectancy expected to begin rising again and, provided efforts to reduce the expansion of the HIV/AIDS epidemic and to treat those affected by it succeed, it is expected to continue rising to reach 67 years in 2045-2050. However, even if these gains materialize, by mid-century the population of Africa is still expected to be subject to the highest mortality levels in the world, with its overall life expectancy being 9 years lower than the next lowest one, that of Asia.

In nearly all countries of the world, female life expectancy at birth is higher than that of males. At the world level, females have a life expectancy of 70 years in 2005-2010, compared to 65 years for males (table III.2). The female advantage is considerably larger in the more developed regions (7 years) than in the less developed regions (3.5 years). The gap between male and female life expectancy is particularly narrow in the least developed countries (2.5 years). At the world level, a difference of about 5 years between female and male life expectancy is expected to persist until 2045-2050, but whereas the female to male gap in life expectancy is expected to narrow in the more developed regions, it is expected to widen in the less developed regions.

Under-five mortality, expressed as the probability of dying between birth and the exact age of five, is an important indicator of development and the well-being of children. In 1950-1955, almost a quarter (233 deaths per 1,000 births) of all children born worldwide did not reach their fifth birthday. By 2005-2010, this rate had fallen to 71 deaths per 1,000 births (table A.19). Although child mortality has fallen in all major areas, sub-Saharan Africa has lagged behind in achieving lower levels of child mortality (figure 6). In the 1950s, sub-Saharan Africa and South-Central Asia had similarly high levels of child mortality and both experienced significant reductions until the 1980s but thereafter, the pace of decline in child mortality in sub-Saharan Africa slowed down. As a result, by 2005-2010, under-five mortality had reached 82 deaths per 1,000 births in South-Central Asia, but it was still a high 148 deaths per 1,000 births in sub-Saharan Africa.

B. THE DEMOGRAPHIC IMPACT OF AIDS

Twenty-nine years into the HIV/AIDS epidemic, its impact on the populations of the highly-affected countries is evident. In the *2008 Revision*, the impact of HIV/AIDS is explicitly modelled for 58 countries, down from 62 in the *2006 Revision*. In most of these countries, HIV prevalence in 2009 was estimated to be 1 per cent or higher among the population aged 15-49 years (table A.20). Five populous countries with lower prevalence levels were also included because they have a large number of persons living with HIV. They are Brazil, China, Honduras, India and the United States.

Among the 58 highly affected countries, 38 are in Africa, four in Asia, 11 in Latin America and the Caribbean, three in Europe, one in Northern America and one in Oceania. Together they account for 28.1 million of the 33.0 million HIV-infected adults and children estimated to be alive in 2007 or 85 per cent of the world total.

The dynamics of the HIV/AIDS epidemic as reflected in the *2008 Revision* are consistent with the estimates of HIV prevalence in 2007 as reported by UNAIDS⁶ for each country. Beginning in 2007, the *2008 Revision* assumes that changes in behaviour, along with treatment, will reduce the chances of infection. Rates of recruitment into high-risk groups are assumed to decline as well. In light of major

⁶ 2008 Report on the global AIDS epidemic (Geneva, UNAIDS, 2008).

expansions in antiretroviral therapy (ART) coverage, average survival of those infected is expected to increase at a rate determined by projected levels of ART coverage and efficacy. However, because the epidemic is still expanding, some countries are expected to experience increasing levels of HIV prevalence over the medium-term future. Nevertheless, in nearly all highly affected countries, HIV prevalence is projected to be lower in 2025 than in 2009 (table A.20).

In the *2008 Revision*, the estimated and projected long-term impact of HIV/AIDS is somewhat less severe than that projected in the *2006 Revision*. Part of this reduction is due to the incorporation of revised and lower estimates of HIV prevalence for several countries where nationally representative data on the epidemic have become available. Another part stems from the assumption that antiretroviral therapy will reach an ever increasing proportion of the persons who need it and that, as a result, those persons will not only survive longer but will be less infectious. However, realization of these projections is contingent on sustained commitment by Governments to assure treatment for those infected and to promote preventive measures and behavioural changes among the uninfected.

The *2008 Revision* confirms yet again the devastating toll AIDS has in terms of increased morbidity, mortality and population loss. Life expectancy in the most affected countries already shows dramatic declines. In Botswana, where HIV prevalence is estimated at 24 per cent in 2007 among the population aged 15-49 years, life expectancy has fallen from 64 years in 1985-1990 to 48 years in 2000-2005. By 2005-2010, life expectancy is expected to increase again to 55 years as a result of declining HIV prevalence and increased access to anti-retroviral therapy. In Southern Africa as a whole, where most of the worst affected countries are, life expectancy has fallen from 61 to 53 years over the last 20 years. While the impact in Southern Africa is particularly stark, the majority of highly affected countries in Africa have experienced declines in life expectancy in recent years because of the epidemic.

In countries where HIV prevalence rates are lower, AIDS has mainly slowed down the increase in life expectancy. To assess the impact of the disease on life expectancy in these countries, the medium variant projections are compared with a hypothetical scenario in which AIDS does not exist. One can thus conclude that in 2005-2010, for instance, life expectancy is expected to be lower than it would have been in the absence of AIDS by 1.13 years in Cambodia, by 1.40 years in the Dominican Republic, and 1.25 years in Ukraine. A larger impact is yet to come in many countries, such as India, where the impact of AIDS on life expectancy relative to the No-AIDS scenario is projected to increase from 0.50 years in 2005-2010 to 0.54 years in 2010-2015. Similarly, in the Russian Federation, that difference is projected to rise from 0.99 year in 2005-2010 to 1.08 years by 2010-2015.

The toll that HIV/AIDS is taking is already retarding progress in reducing child mortality. Thirty-five per cent of children infected through mother-to-child transmission are estimated to die before their first birthday, and 61 per cent die by age five. The impact of HIV on child mortality is particularly dramatic in countries that had achieved relatively low levels of child mortality before the epidemic began. In Zimbabwe, for instance, where under-five mortality was one of the lowest in sub-Saharan Africa, it has risen from 88 child deaths per 1,000 births in 1985-1990 to 112 per 1,000 in 2000-2005 and is projected to decline to 94 per 1,000 in 2005-2010. In Swaziland, under-five mortality has risen from 107 to 126 deaths per 1,000 births between 1985-1990 and 2000-2005, and is expected to decline to 102 deaths per 1,000 in 2005-2010. The impact of HIV/AIDS on child mortality is projected to decrease in the future with improved prevention of mother-to-child transmission.

AIDS reshapes the percentage distribution of deaths by age. In 1985-1990, deaths in Southern Africa were concentrated among young children and older adults (figure 7), and adults aged 20 to 49 years accounted for only 20 per cent of all deaths. By 2005-2010, a shift had taken place in the distribution of deaths by age, with 51 per cent of all deaths occurring between the ages of 20 and 49. Such

large increases in mortality deplete the cohorts that are in the prime of their working and parental careers, creating the potential for severe shocks to economic and societal structures.

AIDS-related mortality and its impact on the potential number of births are reshaping the age structure of populations in the affected countries. Figure 8 shows the effect on the population of Southern Africa in 2015 by comparing the age distribution resulting from the No-AIDS scenario with that projected under the medium variant. The population aged 15 or over is 12 per cent smaller according to the medium variant than according to the No-AIDS scenario. The reduced size of cohorts under age 15 is partly due to the deaths of large numbers of women during the reproductive ages and to the lower survival prospects of infected children. Total population in Southern Africa in 2015 is projected to be 59.7 millions or 11 per cent lower than according to the No-AIDS scenario.

Despite the effect of the epidemic on reducing population growth rates, the populations of affected countries are generally expected to be larger by mid-century than today, mainly because most of them maintain high to moderate fertility levels. In fact, owing to the downward revision of the prevalence of HIV/AIDS combined with the expected expansion of access to anti-retroviral therapy and efforts to control the further spread of HIV, all the countries with the highest prevalence in 2007 are expected to experience positive population growth rates between 2005 and 2050.

TABLE III.2. LIFE EXPECTANCY BY SEX FOR THE WORLD AND MAJOR DEVELOPMENT GROUPS, 2005-2010 AND 2045-2050

Major area	Life expectancy at birth (years)			
	2005-2010		2045-2050	
	Male	Female	Male	Female
World	65.4	69.8	73.3	77.9
More developed regions.....	73.6	80.5	79.9	85.6
Less developed regions.....	63.9	67.4	72.2	76.5
Least developed countries	54.7	57.2	66.7	70.4

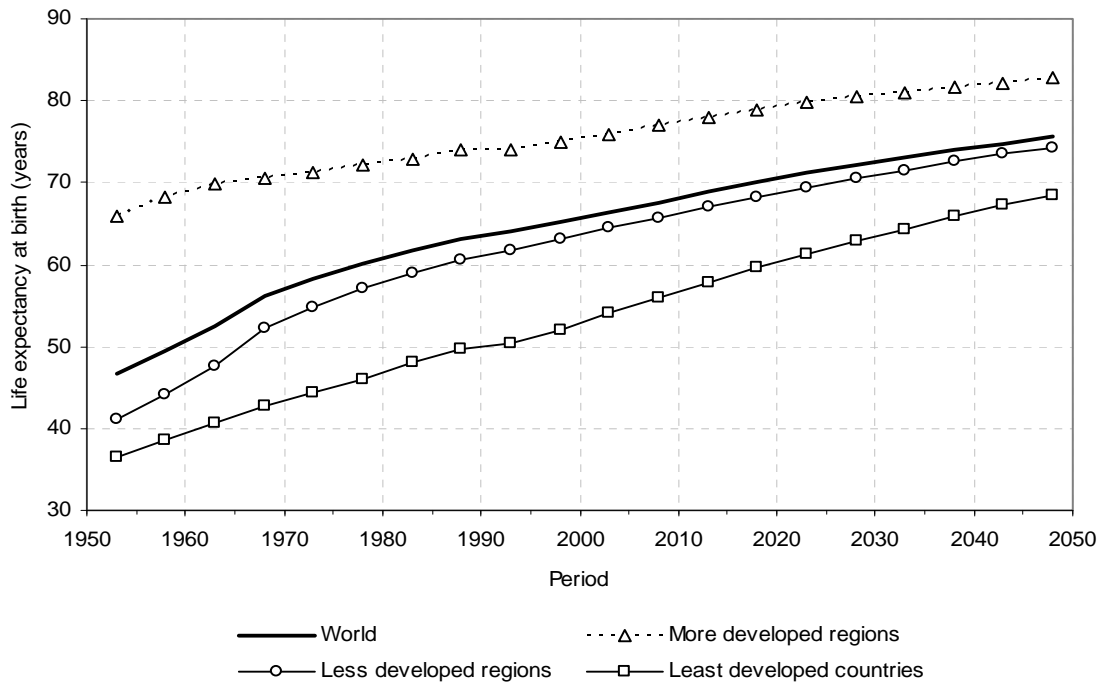
Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (2009). *World Population Prospects: The 2008 Revision*. New York: United Nations.

TABLE III.3. DIFFERENCE IN PROJECTED POPULATION IN THE MEDIUM VARIANT VERSUS A NO-AIDS SCENARIO FOR GROUPS OF AFFECTED COUNTRIES, 2010, 2015 AND 2050

Group of countries	Population difference (thousands)			Percentage difference		
	2010	2015	2050	2010	2015	2050
All 58 affected countries.....	-39 732	-54 263	-158 156	-0.9	-1.2	-2.8
38 countries in Africa	-29 650	-40 848	-129 487	-3.6	-4.4	-7.5
4 countries in Asia	-6 955	-9 249	-20 435	-0.3	-0.3	-0.6
11 countries in Latin America and the Caribbean.....	-1 223	-1 523	-3 323	-0.5	-0.6	-1.2

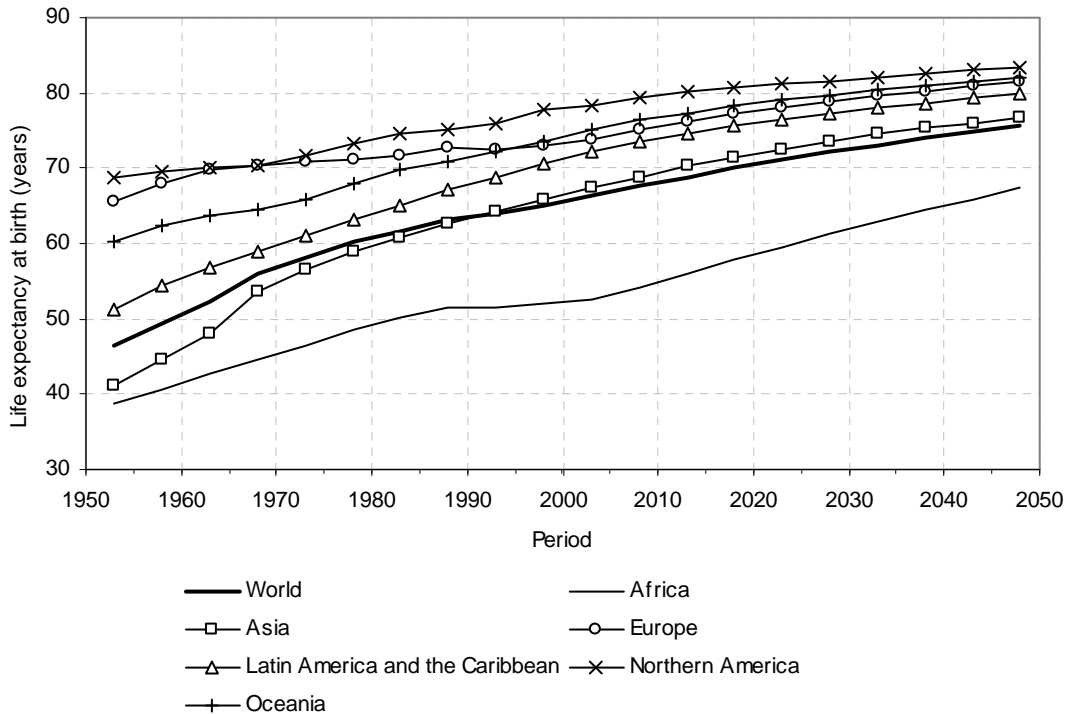
Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (2009). *World Population Prospects: The 2008 Revision*. New York: United Nations.

Figure 4. Life expectancy at birth for the world and the major development groups, 1950-2050



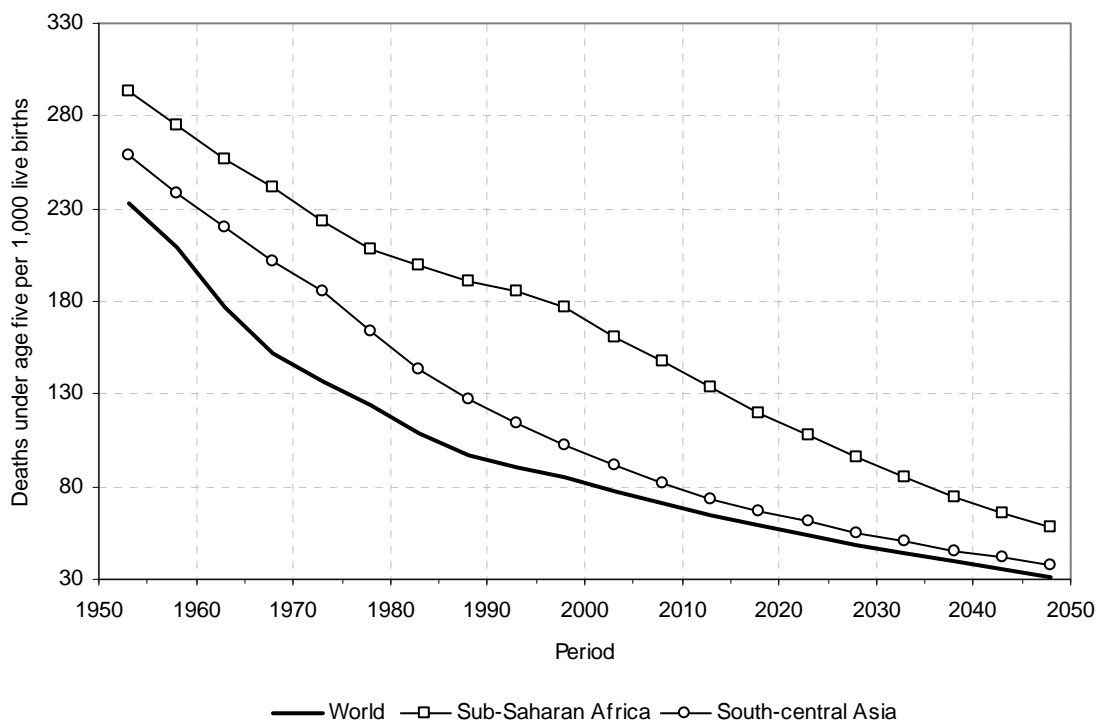
Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (2009). *World Population Prospects: The 2008 Revision*. New York: United Nations.

Figure 5. Life expectancy at birth for the world and the major areas, 1950-2050



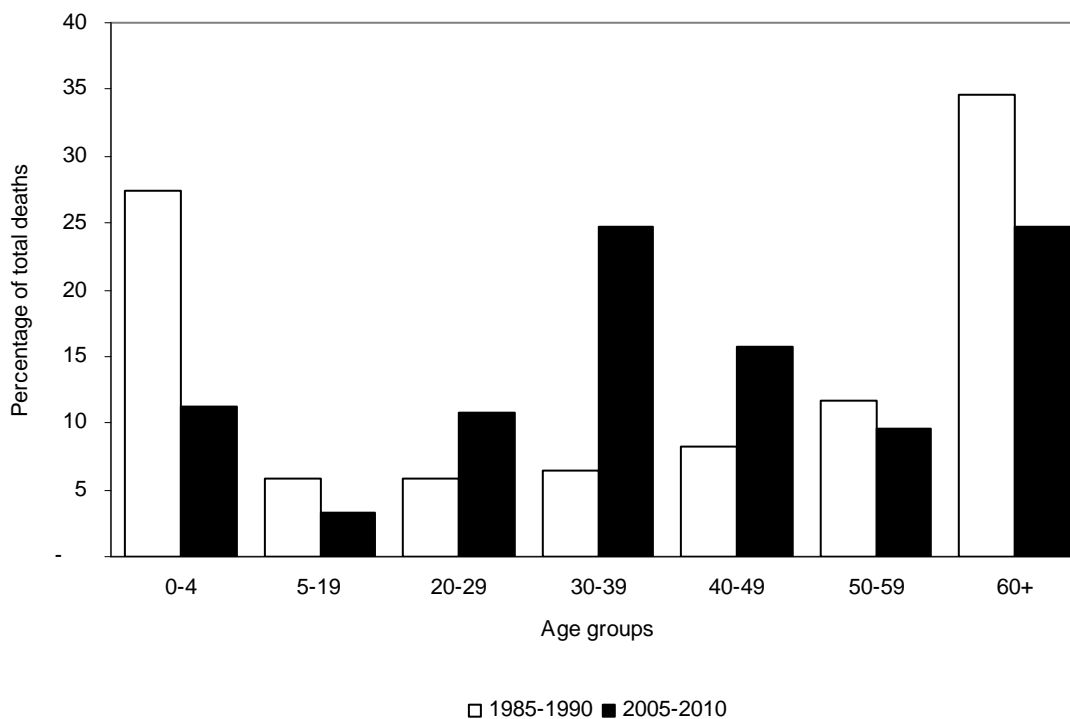
Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (2009). *World Population Prospects: The 2008 Revision*. New York: United Nations.

Figure 6. Under-five mortality for the world and selected regions, 1950-2050



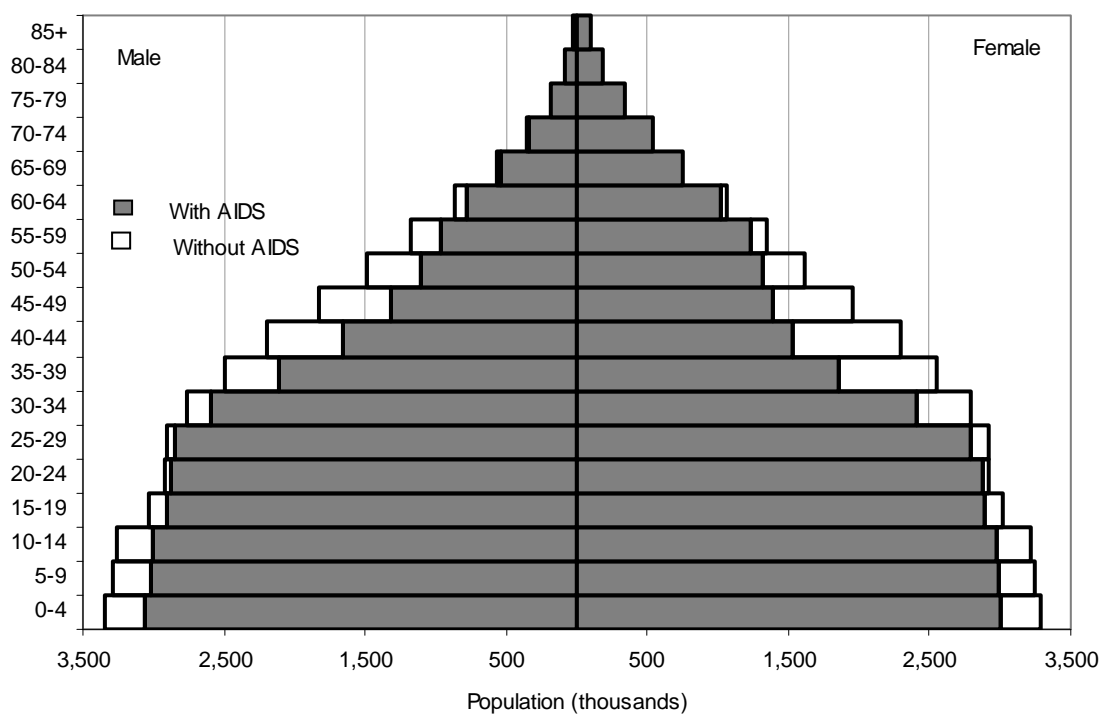
Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (2009). World Population Prospects: *The 2008 Revision*. New York: United Nations.

Figure 7. Percentage distribution of deaths by age, Southern Africa, 1985-1990 and 2005-2010



Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (2009). World Population Prospects: *The 2008 Revision*. New York: United Nations.

Figure 8. Population in 2015, with AIDS and without AIDS, by sex and age group, Southern Africa



Source: Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat (2009). *World Population Prospects: The 2008 Revision*. New York: United Nations.