

04

Progress towards the Millennium Development Goals

Women and children carrying water in India. © Ray Witlin – World Bank



In this chapter we focus on how on track we are to achieving the Millennium Development Goals (MDGs). The short answer is that progress is mixed. At the global level there have been significant achievements, but at regional and country level, especially in Sub-Saharan Africa and South Asia progress is disappointing. The reasons are complex, involving many factors, some generic, most very specific to particular countries. We believe that science and innovation will play an important part in accelerating progress towards the MDGs.

1. How did the MDGs originate?

The MDGs represent an extraordinary consensus by the international community on the nature of development and on a set of potentially achievable targets. In one sense they were not new. They had antecedents in the Universal Declaration of Human Rights, the Development Decade of the 1960s and the many United Nations (UN) summits in the second half of the 20th century that set goals for reducing hunger, improving health, eradicating diseases and educating children.¹ Unfortunately, few of these goals went beyond rhetoric. This began to change in 1990 with the recognition, by both the World Bank and the United Nations Development Programme (UNDP), of the need for economic reform to be accompanied by social policies.^{2,3} The UNDP went so far as to argue that human beings are the ends, as well as the means, of development, challenging the focus of many economists and policymakers on per capita economic growth. It encouraged a focus on the poor and poorest and the prioritisation of capability enhancing services (such as food security, education and health).^{1,4,5,6}

1990 was also the year of the World Summit for Children in New York, which was highly effective in mobilising public support and political commitment and in setting concrete targets which were then successfully implemented. This was followed by a number of other target setting summits and a series of meetings under the Organisation for Economic Cooperation and Development's (OECD) Development Assistance Committee which, in 2000, resulted in a joint OECD UN, World Bank and International Monetary Fund (IMF) report called '*A Better World for All*', that drew up seven 'International Development Goals' (IDGs). These included halving the number of people living in extreme poverty by 2015 and targets related to infant, child and maternal mortality, access to safe and reliable family planning methods and universal primary education.⁷

The IDGs received a mixed reception, not least in the developing countries where they were seen as another imposition by the rich nations. However, they began to gain acceptance, in part, through the efforts of Clare Short, then Secretary of State for the UK's Department for International Development (DFID). She, and other world development leaders, were successful in gaining support from developing country leaders.

In 1999 preparations began among senior UN staff for the Millennium Assembly of the United Nations, to be held in New York in September 2000. The UN's new Secretary-General, Kofi Annan, was keen to make global poverty reduction central to the UN agenda. This resulted in April 2000 with the launch of '*We the Peoples: the Role of the United Nations in the 21st Century*.' In some respects it was different from *A Better World for All*. It was longer and covered a much wider range of topics. But it also lacked the clear targets approach of the IDGs.

'*We the Peoples*' formed the basis for the Millennium Declaration of 8 September 2000 and for the subsequent intense negotiations between the various multilateral and bilateral agencies which led to the final, '*Road map towards the implementation of the United Nations Millennium Declaration*', published by the UN in 2001. This set out, for the first time, the MDGs.⁸

2. What are the goals?

The final set of goals, combine the aspirations in *'We the Peoples'* with their roots in the concept of human development and the measurable targets approach of the IDGs. The targets reflect an attempt to incorporate a results-based management approach taking the goals beyond rhetoric, to outputs and outcomes, for which the international community has to be accountable.⁹

Although approved by the UN General Assembly in 2000, the baseline for the targets is 1990. The end date is 2015. In summary they are to:

- Halve poverty and hunger;
- Achieve universal primary education;
- Eliminate gender disparity in education;
- Reduce by two thirds the under-five mortality rate;
- Reduce by three quarters the maternal mortality ratio;
- Halt and reverse the HIV/AIDS epidemic and the incidence of malaria and other major diseases;
- Ensure environmental sustainability, including halving the proportion of the population without sustainable access to safe drinking water and basic sanitation, and achieve a significant improvement in the lives of a 100 million slum dwellers;
- Develop a global partnership for development.

The UN in its 2009 report records significant measurable progress:¹⁰

- 'Those living in extreme poverty in the developing regions accounted for slightly more than a quarter of the developing world's population in 2005, compared to almost half in 1990;
- Major accomplishments were also made in education. In the developing world as a whole, enrolment in primary education reached 88 % in 2007, up from 83 % in 2000;
- Deaths of children under five declined steadily worldwide – to around nine million in 2007, down from 12.6 million in 1990 – despite population growth. Although child mortality rates remain highest in Sub-Saharan Africa, recent survey data shows remarkable improvements in key interventions that could yield major breakthroughs for children in that region in the years ahead. Among these interventions are the distribution of insecticide-treated mosquito nets to reduce the toll of malaria – a major killer of children. As a result of 'second chance' immunizations, dramatic progress is also being made in the fight against measles.'

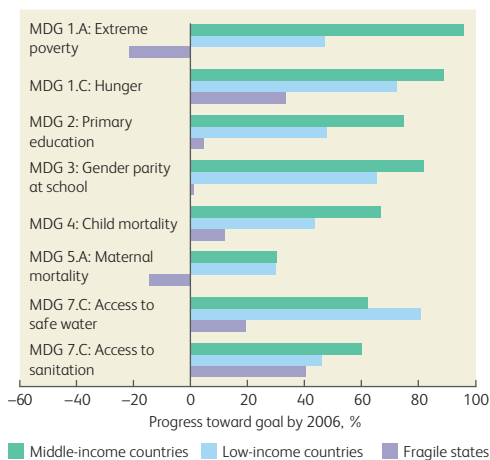
But on balance, as the World Bank notes, the record is mixed. *'Progress is uneven across MDGs, with goals related to human development (primary school completion, child and maternal mortality) recording slower progress than those more immediately influenced by economic growth or the expansion of infrastructure networks (income poverty, gender parity at school, access to water and sanitation); mixed because progress differs significantly across countries, regions, income groups, or institutional status – with fragile and conflict-affected states lagging behind on all counts.'*¹¹ (Figure 4.2 – page 92)



Figure 4.1 – Children in a makeshift school room after a cyclone destroyed their school in Mozambique

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Figure 4.2 – Progress towards the MDGs is least in the fragile states¹¹



It is evident that formidable challenges remain. As was clear from the beginning, the targets are very ambitious. Moreover, it is important to remember that the MDGs were established as global goals. Indeed, some of them were determined by simply extending recorded global trends in improvement in education and health to the year 2015, and calculating from this the percentage improvement that would be required, relative to 1990 levels. As global targets, success would be achieved by a combination of countries moving at different rates towards 2015, some much more rapidly than others, reflecting both their starting point and their effort. However, MDGs have been consistently interpreted as national targets, not global ones. While this provides extra impetus to national efforts to achieve MDGs, it runs the risk of mis-representing some countries as successes and others as failures.

As a region, Africa has often been portrayed as “failing” on the MDGs, which is neither an entirely fair, nor a helpful perspective. It ignores significant achievements that can be built upon and provide a basis for optimism.

African countries such as Ghana, Mozambique, Rwanda, Tanzania and Uganda, which together account for a third of the region’s population, have been growing at 5-6 % in economic terms in recent years. They, and other countries, have impressive development records, for example:

- Ghana, Mozambique, Tanzania and Uganda in accelerating growth and reducing poverty;
- Malawi in achieving particular success in boosting agricultural productivity;
- Ghana, Kenya, Tanzania and Uganda in increasing primary school enrolment;
- Niger, Togo and Zambia in combating malaria;
- Senegal and Uganda in increasing access to water and sanitation;
- Niger in promoting reforestation;
- Rwanda in achieving an impressive recovery from conflict.¹¹

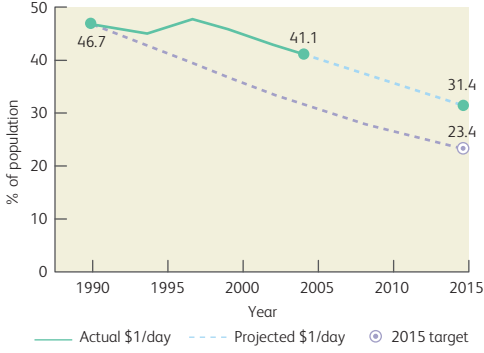
They demonstrate that rapid and large-scale progress is possible. The necessary conditions are strong government leadership and policies and strategies that effectively target the needs of the poor, combined with adequate financial and technical support from the international community.

Nevertheless, as is clear from Figure 4.3, of most concern is Sub-Saharan Africa. The challenges ahead are large and in Africa and elsewhere, progress is likely to be severely set back by the recent financial market turbulence and the resulting global economic slowdown.¹¹

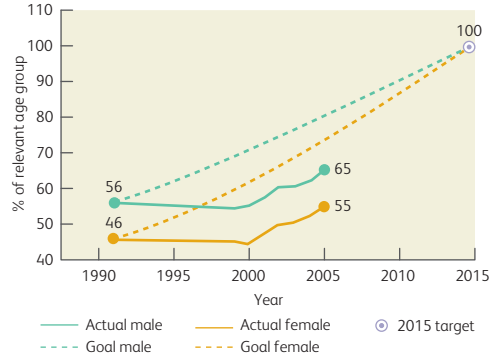
In the following sections, we look at progress on each of several MDGs where science and innovation play an important role – the goals for reducing hunger, improving health and achieving environmental sustainability.

Figure 4.3 – Sub-Saharan Africa’s progress towards some of the MDGs. Dotted lines show the necessary trajectory to meet the goal, while solid lines show actual progress¹¹

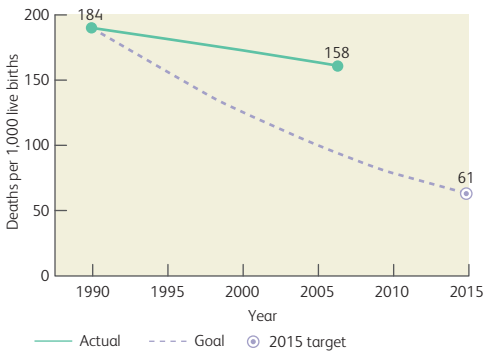
Poverty rate (Proportion living under \$1/day)



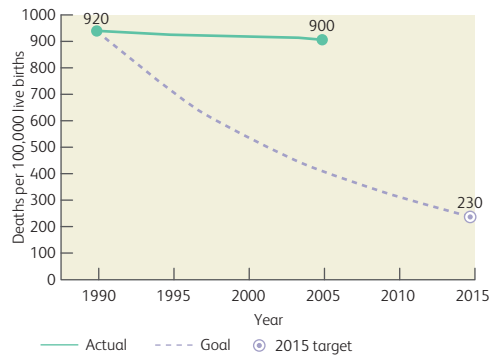
Primary school completion rates



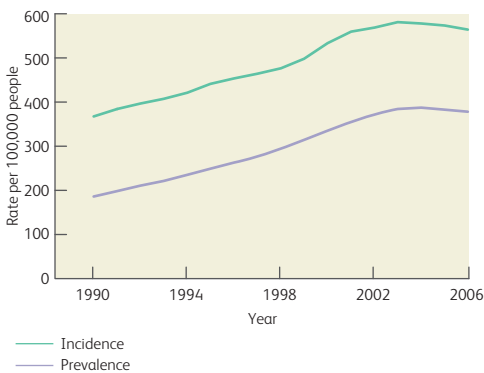
Under-five mortality rate



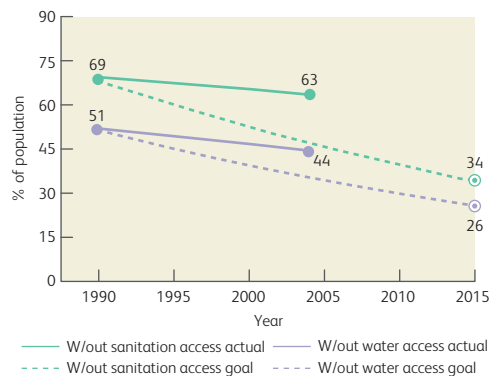
Maternal mortality rates



Tuberculosis incidence and prevalence rates, 1990–2005



Population without access to an improved water source or sanitation facilities



3. Reducing hunger

Hunger is caused by many, often interacting, factors of which poverty is the key. Poverty drives hunger, but lack of adequate nutrition reduces the ability to work productively thus resulting in lower incomes and less food production, so further increasing hunger. The urban poor can spend over 60 % of their incomes on food but for the rural poor it has been as high as 80 % in 2009.¹² This is one component of the vicious circle that forms part of the poverty trap. In many parts of the developing world the trap is reinforced by weak governance, poor economic policies and armed conflict.¹³

Therefore, the first MDG addresses this large and overarching problem, with the goal to: eradicate extreme poverty and hunger. The goal contains three targets, relating to poverty reduction, employment and hunger. Here we will look more closely at target 1.C:

- Halve, between 1990 and 2015, the proportion of people who suffer from hunger.

Which is measured using two indicators:

- Proportion of the population below the minimum level of dietary energy consumption;
- Prevalence of underweight children under-five years of age.

First, it is interesting to note that the poverty goal target of this MDG may be met for the developing countries. Poverty in the developing world has fallen since 1990. The proportion of poor (measured as living under US\$1 a day) has dropped from 46 % to 27 % in 2005, but much of this is due to the spectacular progress of the Chinese economy where the proportion has fallen from 60 % to 16 %.¹⁴

However, there are serious shortfalls in fighting hunger and malnutrition – which the World Bank refers to as the “forgotten MDG”.¹¹ As they also point out, it is the MDG with a “multiplier” effect, because it is essential to success on a number of other MDGs, which also are unlikely to be met, including maternal health, infant mortality, education, and ultimately, as noted above, poverty itself.

Measures of hunger

The first indicator for the hunger target, the proportion of the population below the minimum level of dietary energy consumption, is essentially a measure of food deprivation. As it is not possible to monitor how much food each person in the world consumes, the measurement is based on the average amount of food available for human consumption per person in each country, the level of inequality in access to that food and the minimum number of calories required for an average person. The Food and Agriculture Organisation (FAO) compiles “food balance sheets” for each country every year which estimate how much of each food commodity a country produces, imports and withdraws from stocks for other non-food purposes. It then divides the energy equivalent of all the food available for human consumption by the total population to come up with average daily energy consumption.

Household surveys determine the degree of inequality in access for food and the minimum level of dietary energy requirement is set for different sex and age groups by the WHO.

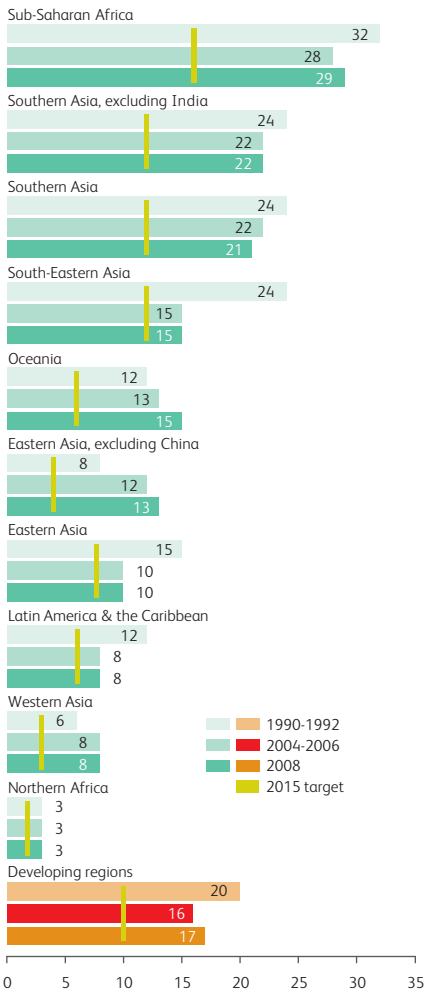
The second indicator, the prevalence of underweight children under-five is not only a measure of food deprivation, but also of other factors such as infections, adverse environmental conditions and inadequate care.

From 1990, in the developing regions, the proportion of the population undernourished has fallen from 20 % to 17 % in 2008 (Figure 4.4). Much of this is due to the fall in China from 15 % to 9 % in 2004. South East Asia has also done very well. For the developing regions as a whole the proportion of children under-five who are underweight still remains high, having fallen from 31 % to 26 % by 2007, but again there has been a dramatic fall in China, from 19 % to only 7 % in 2005.¹⁵

In Sub-Saharan Africa, Ghana is the only country that is going to meet the MDG, indeed it has already done so. Its proportion of undernourished has fallen from 34 % to a mere 9 %, although the drop in under-five underweight has fallen less, from 27 % to 18 % by 2006, but still on track.

Figure 4.4 – Declines in the proportion of undernourished people and % underweight children under-five.¹⁰
 (Note the percentage undernourished in developing countries rose from 16 % to 17 % in 2008 largely as a result of the food price spike, which is discussed in the next chapter)

Proportion of undernourished population, 1990-1992, 2004-2006 and 2008 (Percentage)



Proportion of children under-five who are underweight, 1990 and 2007 (Percentage)

Note: Prevalence of underweight children is estimated based on the NCHS/WHO/CDC reference population

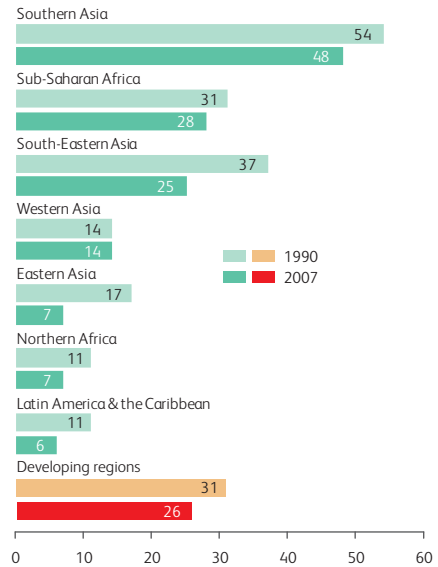
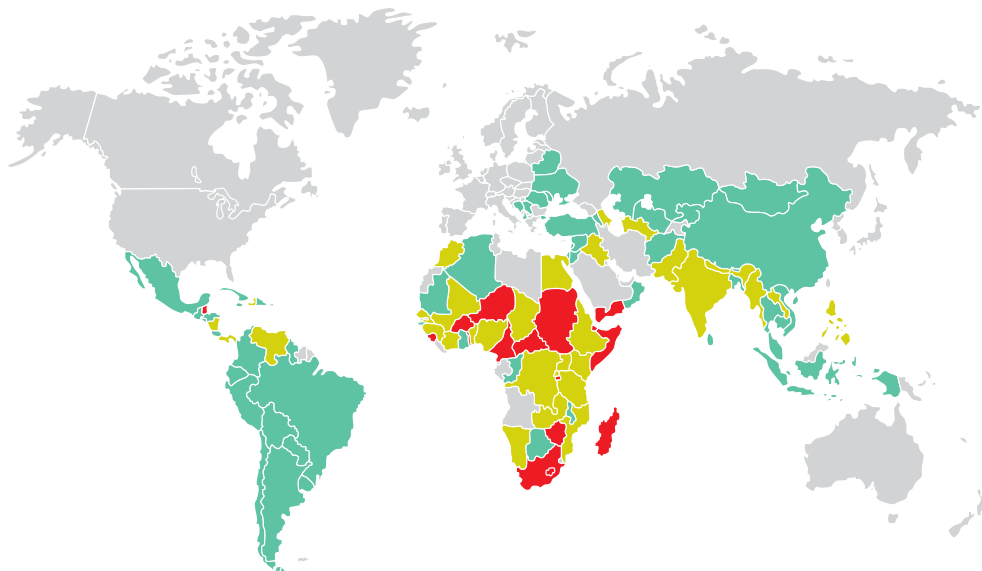


Figure 4.5 – Most of Sub-Saharan Africa and South Asia is not on track for the hunger MDG¹⁶

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Progress towards the MDG target, with countries classified according to the following thresholds:

- On track: Average annual rate of reduction (AARR) in underweight prevalence (1990-2006) is greater than or equal to 2.6%, or latest available estimate of underweight prevalence is less than or equal to 5%, regardless of AARR
- Insufficient progress: AARR is between 0.6% and 2.5%
- No progress: AARR is less than or equal to 0.5%
- Data not available

Progress in China and Ghana

China’s progress is largely due to the agricultural reforms that occurred between 1978 and 1989 bringing in a decentralised agricultural production system and liberal markets. Agricultural production growth increased as a result, from 2.6% to 7.1% a year. It fell back in the late 1980s but increased again as a result of further reforms in the 1990s. The reforms provided strong incentives for investment in infrastructure, irrigation systems, new crop varieties (such as hybrid rices) and cropping systems. The growing prosperity in agriculture in turn stimulated the development of rural non-farm activities which, by providing additional sources of income beyond farming, were one of the main factors behind China’s rapid poverty reduction after 1985.¹⁷

It is generally recognised that Ghana’s success owes a great deal to stable, good governance over the past 15 years and sound macroeconomic policies including market liberalization. This has allowed investments in rural infrastructure and agricultural development. While a quarter of the growth has been through expansion of cropped land, there have also been significant increases in maize and cassava yields, new pest-resistant cassava varieties and the growth of smallholder export crops i.e. cocoa and pineapple. As a result, Ghana’s national poverty rate has fallen from 52% in 1991/92 to 29% in 2005/06.¹⁹

It is often said that there is enough food in the world; hunger can be eliminated by better distribution. There is some truth in this and that is why FAO’s food balance sheets (see above)

measure the equality of access to food. But they also take into account the amount of food available. Drought, floods and other natural disasters reduce harvests and the lack of technology results in low crop yields of poor quality and low resistance to pests and diseases. The ability of poor farmers both to feed their own families, and to produce a surplus to sell, not only serves rural and economic growth generally, it also provides a valuable protection during adverse times.

4. Progress towards the health MDGs

People may become ill for a wide variety of reasons. They may catch infectious diseases, such as malaria, HIV and TB. They may fall ill with a non-communicable disease, such as cancer or a cardiac condition. They may suffer from an environmental contaminant such as arsenic in the water supply, or they may be afflicted by an inherited illness. But, often, the condition is made worse than it might otherwise be because they lack an adequate, well-balanced diet. From among these various conditions the MDGs focus on a limited set where the mortality and morbidity rates are especially high – the so-called ‘Killer Diseases’ (Box 4.1).

There are three goals within the MDGs devoted to health, and they are as follows:

- **Goal 4: Reduce child mortality**

Target 4.A: Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate.

- **Goal 5: Improve maternal health**

Target 5.A: Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio;

Target 5.B: Achieve, by 2015, universal access to reproductive health.

- **Goal 6: Combat HIV/AIDS, malaria and other diseases**

Target 6.A: Have halted by 2015 and begun to reverse the spread of HIV/AIDS

Target 6.B: Achieve, by 2010, universal access to treatment for HIV/AIDS for all those who need it;

Target 6.C: Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases.

Box 4.1 The so-called ‘Killer Diseases’^{11,16,20-23}

Deaths per year (millions)

HIV	2.0
Malaria	0.9
TB	1.7
Maternal conditions	0.6
Childhood conditions:	
Diarrhoea	1.5
Pneumonia	2.0
Measles	0.9
Neonatal	4.0

Note: there is some double counting: for example child deaths may be caused by malaria.



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Figure 4.6 – HIV – one of the killer diseases responsible for 2 million deaths a year

This is an ambitious set of goals. Their attainment depends on improved economic conditions and the creation of good health care systems, but also on changes in behaviour and the environment and the discovery and delivery of new vaccines, medicines and other treatments. Progress towards each of the individual goals, as described below, is usually a product of all these factors.

Reducing child mortality

Child mortality is commonly measured using the under-five mortality rate (U5MR), which is the probability that a newborn will die before reaching the age of five (expressed as a rate per 1,000). But three indicators are used: the under-five mortality rate itself, the infant (under one) mortality rate and the proportion of one year-old children immunised against measles.

Vital registration systems which record births and deaths are the best sources of data on infant and under-five mortality rates but these are rarely well functioning and instead household surveys of child histories are employed. The proportion of infants immunised at least once against measles derives from national level reports of vaccinations performed and from household surveys.

Globally considerable progress has been made.²⁴ In 2006, for the first time since mortality data has been gathered, annual deaths among children under-five fell below 10 million. Nevertheless, the levels in developing countries remain unacceptably high: a child born in a developing country is over 13 times more likely to die within the first five years of life than a child born in an industrialised country. Between 1990 and 2006, about 27 countries – the large majority in Sub-Saharan Africa – made no progress in reducing childhood deaths.

South Asia is doing reasonably well, but Sub-Saharan Africa is significantly off-track (Figures 4.7 and 4.8).

Figure 4.7 – Lack of progress towards MDG 4 child mortality. Dotted lines show the necessary trajectory to meet the goal, while solid lines show actual progress¹¹

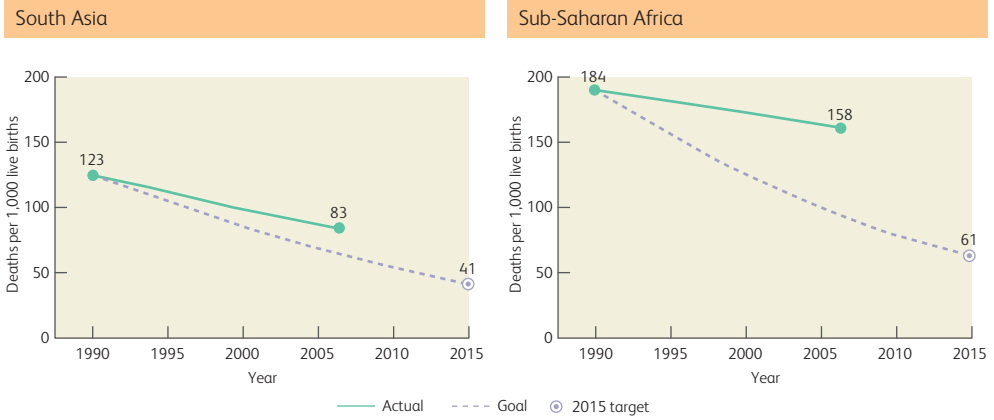
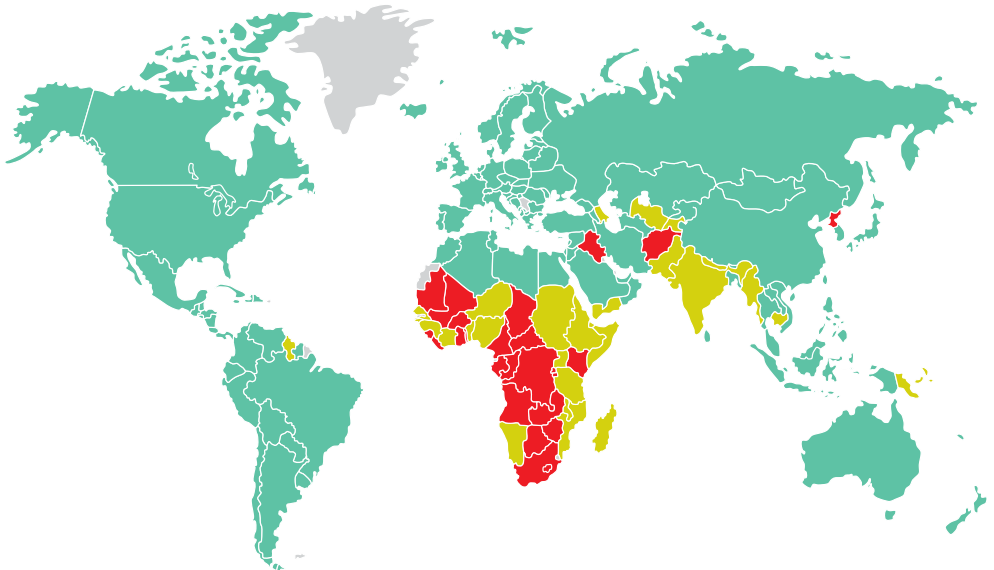


Figure 4.8 – All Sub-Saharan African countries have shown no progress, or insufficient progress towards achieving MDG 4¹⁶

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Progress towards the MDG 4, with countries classified according to the following thresholds:

- **On track:** USMR is less than 40, or USMR is 40 or more and the average annual rate of reduction (AARR) in the under five mortality rate observed for 1990-2006 is 4% or more.
- **Insufficient progress:** USMR is 40 or more and AARR is between 1% and 3.9%
- **No progress:** USMR is 40 or more and AARR is less than 1%
- **Data not available**

The major causes of child mortality are complications during the first 28 days of a newborn’s life (the neonatal period), pneumonia, and diarrhoea. But undernutrition, which limits a child’s ability to fight off disease, is estimated to be the underlying cause in 35 % of these deaths. (Figure 4.9).

Neonatal mortality

Each year some four million children die within the first 28 days of life from a variety of causes (Figure 4.10).

The key medical interventions are well understood. They include: *‘improving women’s health during pregnancy, providing appropriate care for both mother and newborn during and immediately after birth, and caring for the baby during the first weeks of life. Cost-effective, feasible interventions include: initiating breastfeeding within one hour of birth, ensuring proper cord care, keeping the baby warm, recognizing danger signs and seeking care, and giving special care to infants with low birthweight.’*¹⁶ In addition, significant attention must be paid to addressing gender equality, so that women’s needs during pregnancy and birth are given more priority.

As yet no clear indicators for neonatal mortality (as distinct from infant mortality) have been formulated, but it is evident that neonatal deaths remain very high at 44 per 1,000 live births in both Sub-Saharan Africa and South Asia.¹⁶

The causes of child mortality

Once past the neonatal period, pneumonia is responsible for one in five child deaths. Part of the challenge is to provide access to appropriate antibiotics but it is also crucial that a child is seen by a health provider trained to detect those symptoms of pneumonia (fast breathing and difficult breathing) that indicate a need to receive immediate treatment. Over half of all infected children in developing countries are now seen by such a person but the proportion is only 40 % in Sub-Saharan Africa.

Diarrhoea is nearly as important as pneumonia. It is caused by at least 20 viral, bacterial and protozoan pathogens (including *Salmonella spp*, *Shigella spp*, *Vibrio cholerae*, and rotavirus).²⁷ These multiply in the human gut, exit in excreta, contaminate water and other elements of the environment from which they infect human beings causing diarrhoea. *Shigella* related diarrhoea alone could be responsible for as many as a million deaths and rotavirus for half a million.^{28,29}

Figure 4.9 – The causes of child mortality.²⁵ Undernutrition has been estimated to be an underlying cause in 35 % of all under-five deaths²⁶

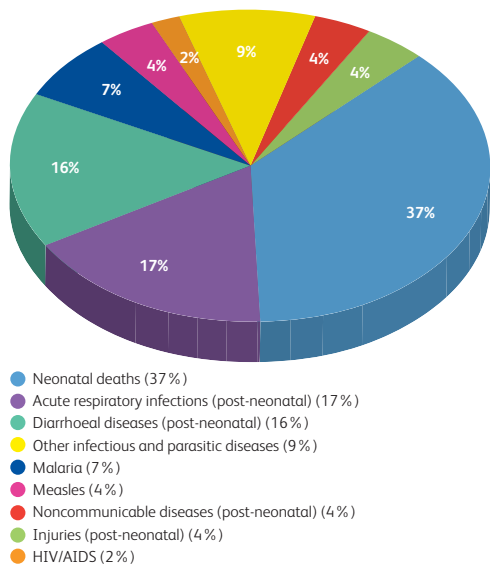
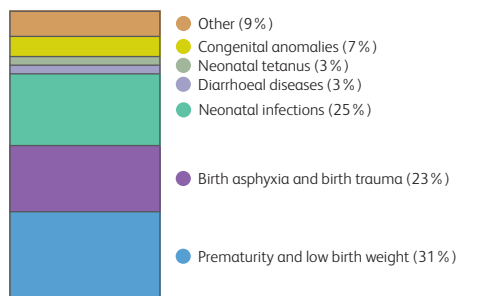


Figure 4.10 – Global causes of neonatal mortality²⁵



Improved sanitation and drinking water is thus critical to reducing child mortality from diarrhoea but, as we shall report under MDG 7, progress here is unsatisfactory and appears to have had little effect.

The biggest success in combating child mortality has been in reducing the incidence of measles and malaria. A measles vaccine is available which is highly effective. The combination of improved routine measles immunization and follow-up campaigns, that provide a second opportunity for children to be immunized, has led to a steep reduction in the number of measles deaths: by 93 % in Sub-Saharan Africa between 2001 and 2008.³⁰

Equally successful has been the control of malaria, which causes 8 % of child mortality.

Maternal mortality

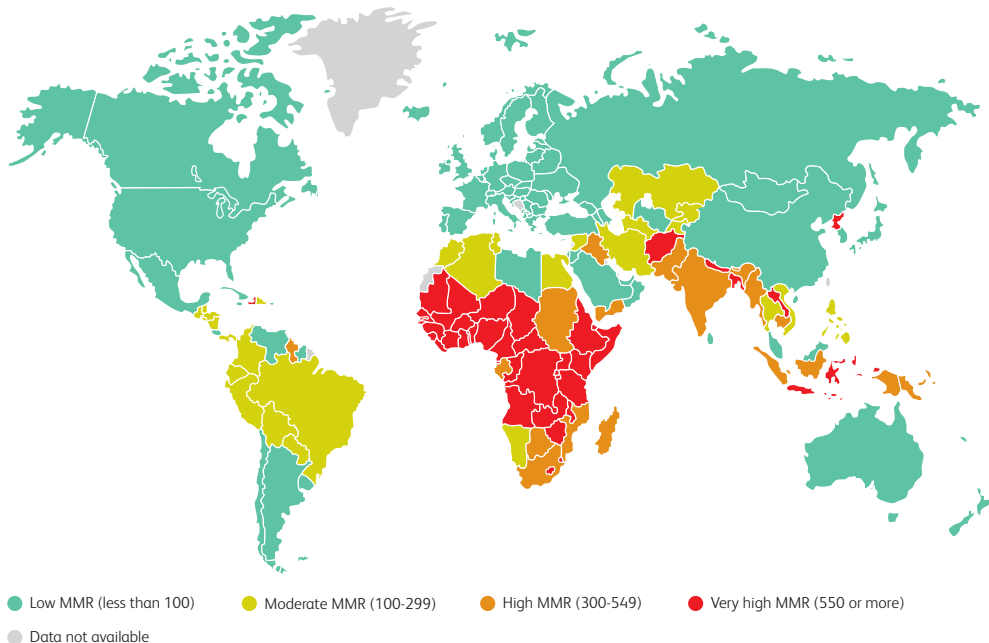
The goal of MDG 5 is to improve maternal health, by aiming to reduce, by three quarters, the maternal mortality ratio (MMR), which is measured by two indicators, the MMR and the proportion of births attended by a skilled health professional.

Maternal mortality is most commonly expressed using the MMR, which records the number of women who die either during pregnancy or delivery due to pregnancy-related conditions per 100,000 live births. This is difficult to measure in part because it is a relatively rare event, thus requiring large sample sizes for household surveys.

A woman in Sub-Saharan Africa has a risk of 1 in 22 of maternal death compared with 1 in 8,000 in industrialised countries.³¹ This difference in risk represents the widest disparity seen for any human development indicator.³²

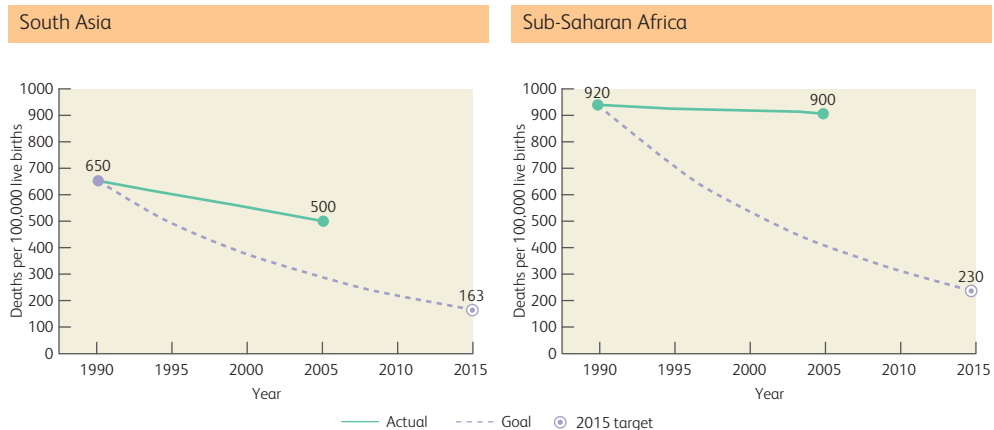
Figure 4.11 – Maternal mortality rates (MMR) per 100,000. Sub-Saharan Africa has an average MMR of 992, compared with 9 in the developed countries¹⁶

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Maternal mortality has decreased globally but not at a rate to achieve the MDG and there has been little progress in Sub-Saharan Africa (Figure 4.12).

Figure 4.12 – Poor progress towards reducing maternal mortality in Sub-Saharan Africa¹¹



The causes of maternal deaths

In Sub-Saharan Africa and South Asia haemorrhage is the main cause of maternal mortality. This is partly why skilled attendance at delivery is critical to reducing deaths. Overall, nearly 60% of births in the developing world are attended by doctors, nurses or midwives but the figures are only 43% for Sub-Saharan Africa and 41% for South Asia. In general this indicator is a better measure of progress than the relatively crude estimates of maternal mortality.

Combating HIV/AIDS

MDG 6 aims to combat HIV/AIDS, malaria and other diseases.

Figure 4.13 – The stabilisation of the prevalence of HIV (the percentage infected) in Sub-Saharan Africa²²

For HIV/AIDS the target is to halt by 2015 and begin to reverse the spread of HIV/AIDS. The principal indicator is the percentage prevalence, that is the proportion of the population 15 to 49 years of age living with HIV, obtained by methodologies developed by UNAIDS and WHO. It has shown a significant decline over the past seven to eight years in Sub-Saharan Africa (Figure 4.13), although it still remains high especially in southern Africa; 26% of the population of Swaziland is infected.

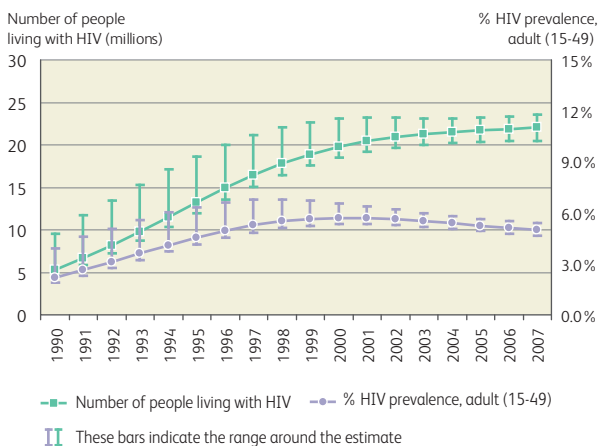
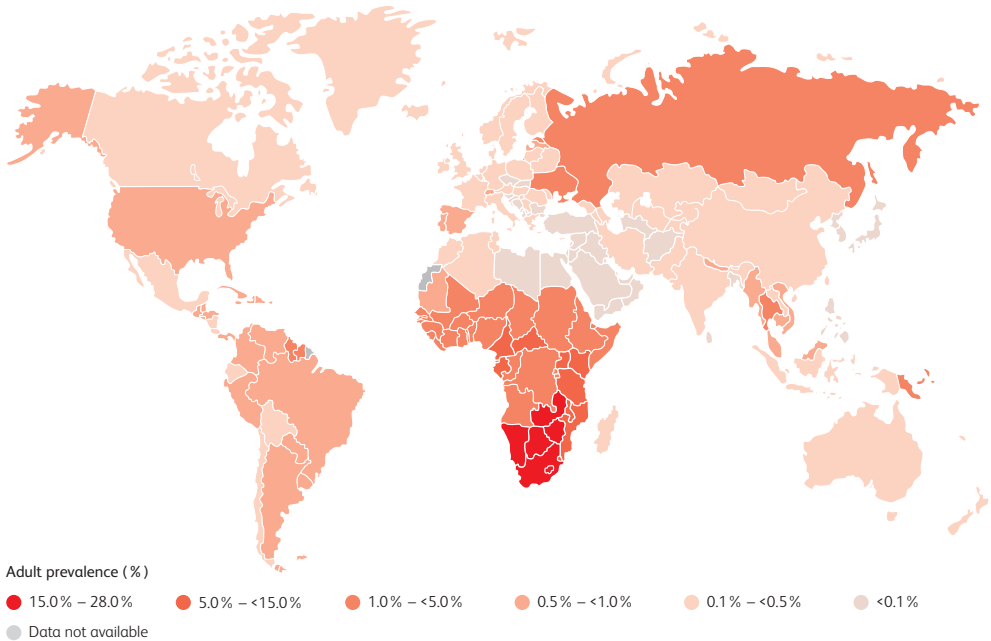


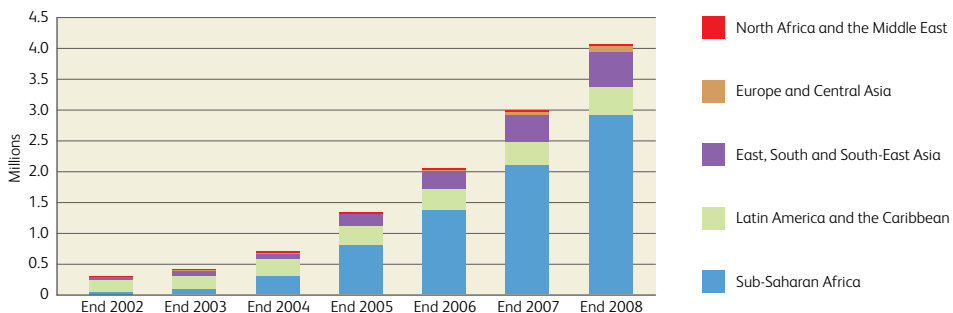
Figure 4.14 – Percent Adult prevalence living with HIV²²



However, the absolute number (as opposed to the proportion of the population) of people living with HIV worldwide has continued to rise. Worldwide, nearly 33 million people are infected, 50% of whom are women. Sub-Saharan Africa is most affected, containing two thirds of those living with HIV.

In part this rise in the numbers infected is due to the decline in the death rate (from a total of 2.2 million in 2005 to 2.0 million in 2007) resulting from the substantial increase in access to antiretroviral therapy in recent years. In six years the number receiving antiretroviral drugs has risen ten-fold (Figure 4.15). The second target is to achieve by 2010 universal access to treatment for HIV/AIDS for all that need it.²²

Figure 4.15 – The rapid increase in the numbers of people receiving anti-retroviral drugs in low and middle income countries.³³



More encouragingly, in a number of heavily affected countries – such as Kenya, Rwanda, Uganda, and Zimbabwe – dramatic changes in sexual behaviour (see Box 6.6) have been accompanied by a decline in the number of new HIV infections. Since the late 1990s the percentage of adults aged 15 to 49 who are infected with HIV in these countries has fallen. However these gains have not been consistent within and between regions.²²

Campaigns against Tuberculosis (TB)

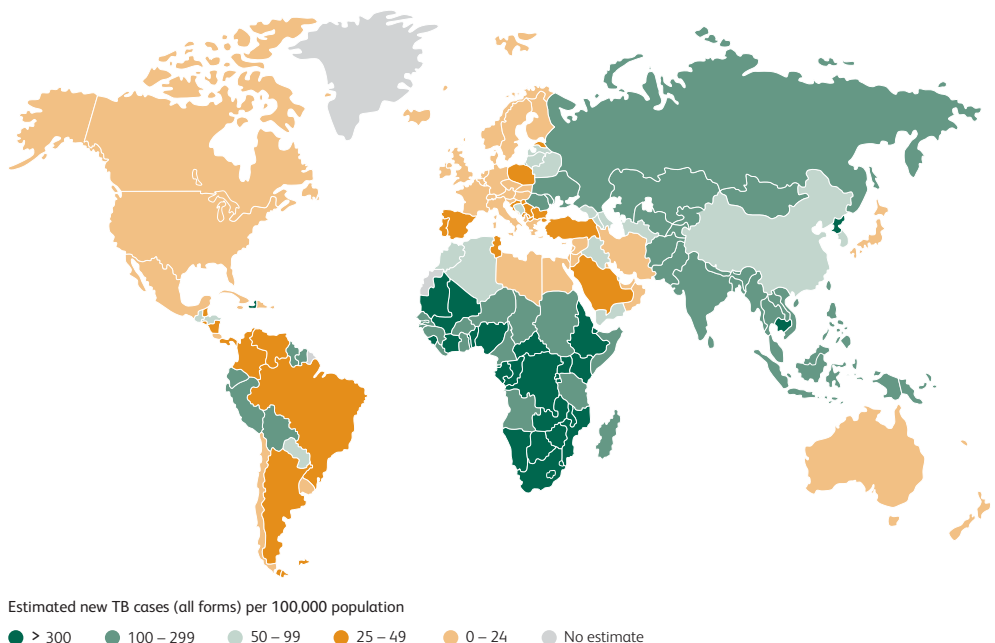
Under MDG 6, TB is a target similar to HIV/AIDS – the aim is to have it halted by 2015 and then to begin to reverse the incidence of TB. The specific indicators are:

1. The incidence, prevalence and death rates associated with TB;
2. The proportion of TB cases detected and cured under directly observed treatment short course (DOTS).

These are computed by WHO based on data submitted in various forms through a consultative and analytical process³⁴. Incidence is the number of new cases per 100,000 of the population, while prevalence is the proportion of the population infected, again per 100,000.

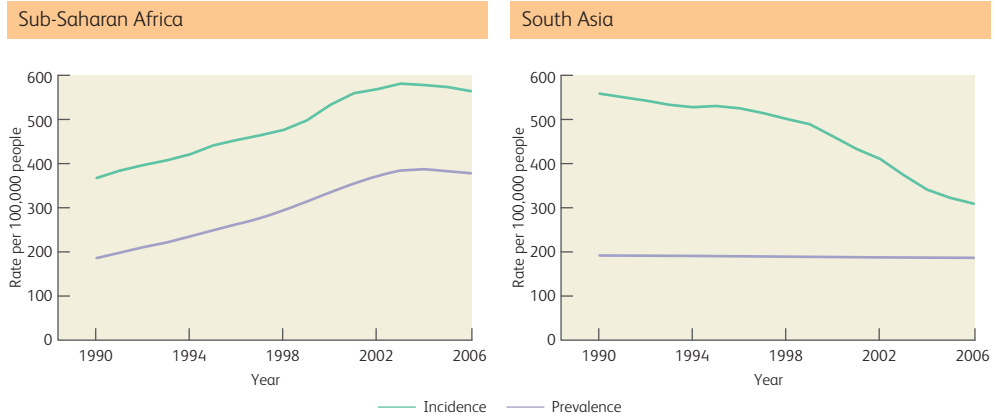
The global incidence of TB appears to have peaked in 2004 and is now levelling off. However, although incidence rates are dropping in all regions, progress has not been fast enough to keep pace with population growth. As a result, the absolute number of new infections is still rising. Globally, there were an estimated 9.3 million new cases of TB in 2007, up from 9.2 million cases in 2006. Most occurred in Asia (55%) and Africa (31%) (Figure 4.16). About 15% of the new cases were among people who were HIV-positive, most of whom (79%) lived in Africa.¹⁰

Figure 4.16 – Incidence of TB is falling in Sub-Saharan Africa but the levels remain very high³⁵



South Asia has already achieved a halving of prevalence, but the incidence is only slowly falling. In Sub-Saharan Africa, incidence and prevalence are only just beginning to fall.²⁰

Figure 4.17 – TB incidence and prevalence in South Asia and Sub-Saharan Africa¹¹



The good news is that non-drug resistant TB is actually fully treatable. Much of the success in reducing mortality and prevalence has been due to the DOTS strategy (directly observed treatment, short course). This involves microscopic examination of the sputum samples of symptomatic patients followed by treatment with antibiotics for six to eight months. In the absence of HIV/AIDS, cure rates have reached as high as 95 %, even in the poorest countries.³⁶ This has been partly due to high levels of detection and high levels of successful treatment.

In 2007 some 5.5 million cases were identified in DOTS programmes. The percentage of estimated cases which were identified by DOTS and non-DOTS programmes combined was 63 %. Treatment success for new cases was 85 % globally.

However, while DOTS is effective in treatment, and hence reduces mortality and prevalence, there is no evidence that the DOTS strategy is reducing transmission or contributing to the fall in incidence.^{20,37} In Sub-Saharan Africa incidence appears to be falling mainly because HIV/AIDS prevalence is falling. In addition, resistance to main-line drugs has been steadily increasing and practitioners are increasingly challenged to come up with strategies beyond DOTS to treat those with multiple drug resistant TB (MDR-TB) (discussed further in Chapter 6).

Tackling malaria

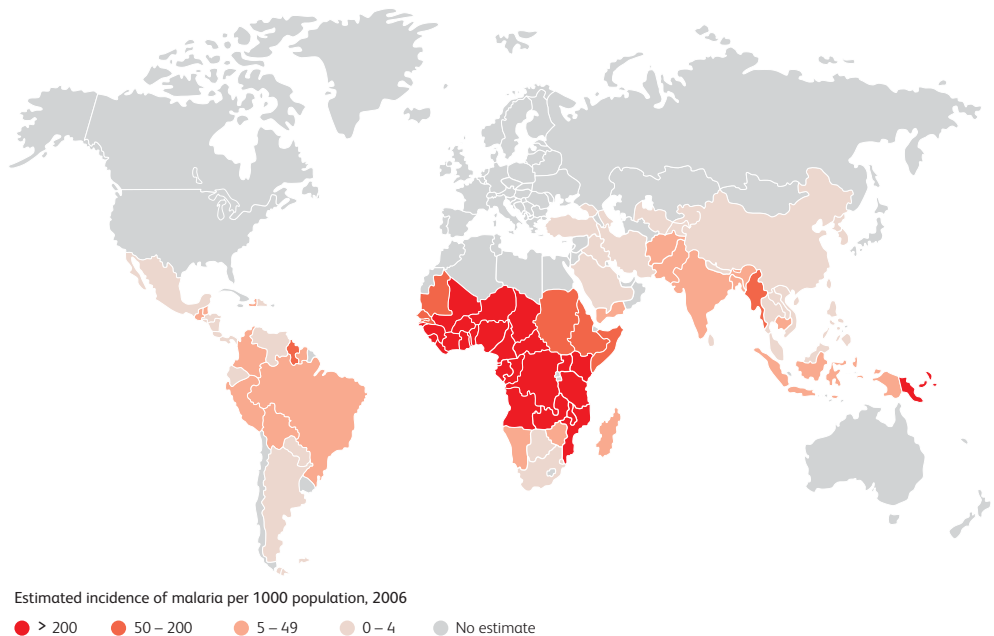
Under MDG 6 the goal is to have halted by 2015 and begun to reduce the incidence of malaria. There are three principal indicators:

1. Incidence and death rates associated with malaria;
2. Proportion of children under five sleeping under insecticide-treated mosquito nets;
3. Proportion of children under five with fever who are treated with appropriate anti-malarial drugs.

Malaria differs primarily from the other 'killer diseases' in that the causative agent is transmitted from person to person via a mosquito.

About half the world’s population (over 3 billion people) is at risk from malaria. Some 250 million cases develop each year with nearly a million deaths, mostly of children under five (Figure 4.18). Over 100 countries are endemic for malaria, 45 in Africa.

Figure 4.18 – Continued high levels of malaria incidence (numbers per 1,000) in Sub-Saharan Africa²¹



Nearly a million people died of malaria in 2006 of which 95 % lived in Sub-Saharan Africa. The vast majority were children under five. Between 190 million and 330 million episodes of malaria occurred that year, with 88 % in Sub-Saharan Africa, 6 % in Southern Asia and 3 % in South-Eastern Asia.¹⁰

According to the UN, *‘the risk of dying from malaria is considerably higher in Sub-Saharan Africa than other parts of the world for several reasons: transmission of the disease is more intense, the more lethal form of the malaria parasite – Plasmodium falciparum – is more abundant, and the region tends to have weak health systems.’*¹⁰

In the case of malaria the estimates for cases and deaths are especially problematic. This is, in part, because over 60 % of cases use facilities in the private sector, shops and pharmacies, or do not seek treatment at all. Also, in many African countries, only a small proportion of suspected malaria cases have laboratory investigation. As a result the diagnosis is unreliable being based only on clinical signs and symptoms. Since slide positivity rates are generally below 50 %, more than half of all clinically diagnosed cases do not have malaria.²¹

However, there is now a well developed suite of tools and methods for combating malaria: long-lasting insecticidal nets (LLIN) and artemisinin-based combination therapy (ACT), supported by indoor residual spraying of insecticide (IRS) and intermittent preventive treatment in pregnancy (IPT) (see Chapter 6).²¹ WHO has set a target of 80 % coverage for each of these interventions in the belief that this will result in a reduction of cases and deaths per capita by 50 % between 2000 and

2010, and by 75 % between 2005 and 2015. In some Asian countries – which are on track to achieve the goal by 2010 – there is evidence of links between interventions and the outcomes, such as with the use of ITNs.²¹

In Africa, the levels are far below these targets (Box 4.2).

Box 4.2 Lack of attainment of targets for malaria interventions in Africa – the WHO goal is 80% coverage. Data for 2006²¹

- 34 % of households with insecticide treated nets in 19 countries;
- 38 % of children with fever treated with anti-malarial drugs in 18 countries (but only 3 % with ACT);
- 18 % of women using IPT in pregnancy in 16 countries;
- Only 5 countries reported IRS coverage sufficient to protect 70 % of those at risk.

Cases of malaria and associated deaths have reduced by 50 % between 2000 and 2006/7 in at least seven out of 45 African countries or areas of countries, but these have relatively small populations, good surveillance and high intervention coverage. In a further 22 countries in other parts of the world, malaria cases fell by 50 % or more, over the same period. However, it is not clear whether these 29 countries are on course to meet targets for reducing the malaria burden by 2010.²¹

In general the record of attainment of the health MDGs is mixed. In some cases, notably malaria, child and maternal mortality, the interventions are relatively well developed and the challenge is to better implement them. In other instances – against HIV/AIDS and TB – there is still a need for new technologies and interventions.

5. Progress towards the environment MDGs

MDG 7 – to ensure environmental sustainability – incorporates a variety of different environmental targets:

1. Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources;
2. Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss;
3. Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation;
4. By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers.

The presentation of MDG 7 differs between international organisations, particularly because the first two targets are inter-related and involve a very diverse range of environmental elements. Below we use the presentation used by UNSTATS, the official UN site for MDG targets and indicators.³⁸

The first two targets have seven indicators:

- Increasing land area covered by forests;
- Combating climate change through reducing CO₂ emissions (total, per capita and per US\$ GDP);
- Reducing the consumption of ozone-depleting substances;
- Restoring fish stocks depleted by over-exploitation;
- Using water resources in a sustainable manner;
- Protecting terrestrial and marine areas;
- Decreasing the proportion of species threatened by extinction.

Increasing forests

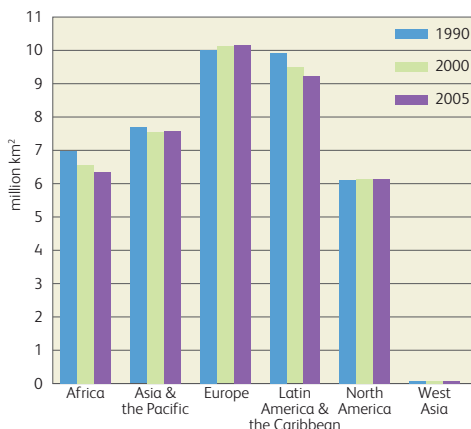
Our growing scientific understanding of the importance of forests in combating climate change places renewed emphasis on the objective of increasing forest cover. Land use change, principally deforestation, is responsible for the release of large amounts of carbon into the atmosphere. Mature forests contain huge carbon stores in the trees, understorey vegetation and within the decaying matter in the soil, and when they are logged or burnt the carbon is released. Deforestation currently accounts for an estimated 17% of global greenhouse gas (GHG) emissions, more than the entire transport sector.³⁹

Most of this is generated in developing countries – in recent years, deforestation in Brazil and Indonesia has produced over half of all GHG emissions associated with land use change. The role of forest conservation in carbon capture and climate change mitigation adds to the critical role played by forests in water conservation and management and in sustaining valuable, harvestable biodiversity for food, fuel, shelter and industrial uses.

Forest cover continues to decrease on a global scale. Between 1990 and 2005 the global surface of forests was reduced by 1.3 million square kilometres, or 3% of its total. Some 40% of the world’s forests are located in Latin America and Sub-Saharan Africa, which are the two most important regional contributors to global deforestation. Latin America and the Caribbean lost 7% of their forests during this 15 year period and Sub-Saharan Africa lost 9%.¹¹

While the losses from deforestation are about 13 million hectares per year (roughly equivalent to the land area of Bangladesh), this is partially counterbalanced by forest planting, landscape restoration and the natural expansion of forests. This has significantly reduced the net loss of forest area. Over the period 2000-2005 the net global loss is estimated at 7.3 million hectares per year, down from 8.9 million hectares per year in 1990-2000. Net losses have been particularly severe in Latin America and Africa. In Asia major afforestation programmes have been underway particularly in China, which has partly compensated for the continued deforestation in Indonesia (Figure 4.19). For the most part, continued losses in tropical countries are attributable to conversion into agricultural land.

Figure 4.19 – Total forest area by region, note that net forest losses are greatest in Latin America and Africa.⁴⁰



Conserving water resources

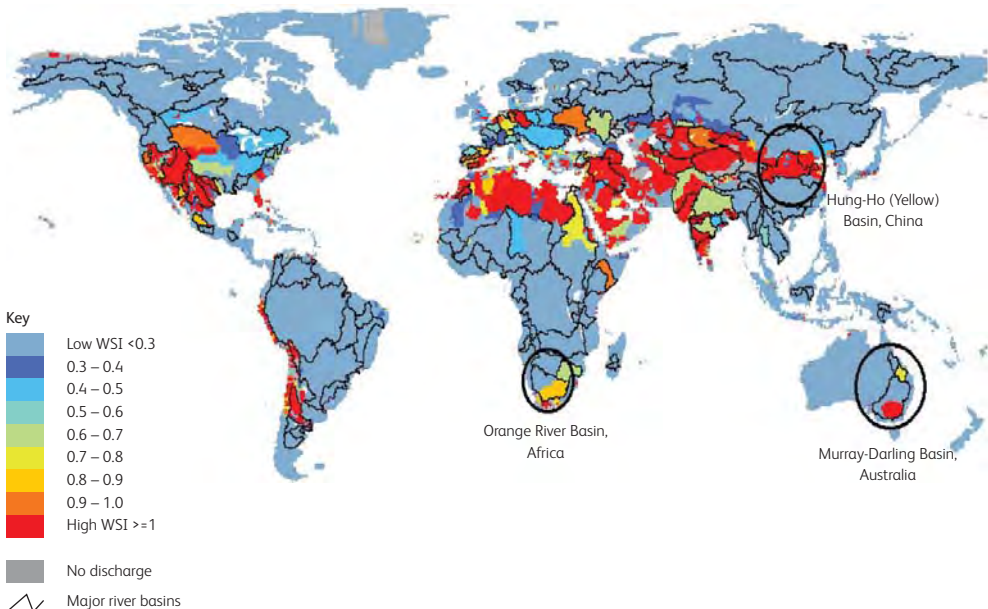
As with forests, countries vary greatly in their supply of water resources. Much water is present as groundwater and difficult to measure and monitor.

Nevertheless, it is evident that available water resources continue to decline as a result of excessive withdrawal of both surface and groundwater, as well as decreased water run-off due to global warming. Already, in many parts of the world, such as West Asia, the Indo-Gangetic Plain in South Asia and the North China Plain, human water use exceeds annual average water replenishment. Use of freshwater for agriculture, industry and energy has increased markedly over the last 50 years. Freshwater shortage has been assessed as moderate or severe in more than half the regions studied in the Global International Waters Assessment (GIWA).⁴¹

UN Water estimated in 2007 that, by 2025, two-thirds of the world's population could be under conditions of water stress, defined as 1,700 m³/person/year – the threshold for meeting the water requirements for agriculture, industry, domestic purposes, energy and the environment. And among that group, 1.8 billion people will be living in countries or regions experiencing absolute water scarcity, with only 500 m³/person/year available.⁴²

The International Water Management Institute (IWMI) also recently assessed global environmental water needs. They went beyond traditional calculations which compare water withdrawals to mean annual run-off, measuring the water needs at a river basin level and finding the amount of water needed to maintain ecosystem functionality. Figure 4.20 below shows areas where human use was found to be in conflict with environmental requirements.

Figure 4.20 – World map of water stress measured by the environmental Water Stress Indicator (WSI), which takes into consideration the amount of water needed for ecosystem sustainability⁴³



Managing fisheries

Developing countries are highly dependent on marine and freshwater fisheries. Fish provide 2.6 billion people with over 20 % of their protein intake. Two-thirds of world fisheries production comes from fish capture. Together China, Peru, Chile, Indonesia, and India accounted for 45 % of inland and marine fish catches in 2004.¹¹

Currently about half of all stocks are fully exploited, implying that production is close to maximum sustained yield. The share of overexploited fish populations has increased, from 10 % in 1974 to 25 % and the most commercially successful species are all fully exploited or overexploited (see Figure 4.21).

Figure 4.21 – The percentage of fully exploited fish stocks are increasing¹¹

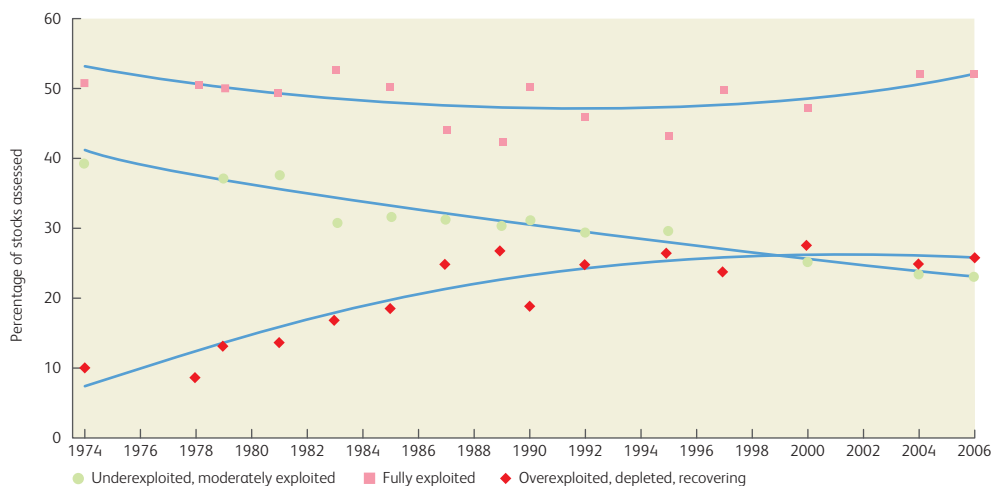
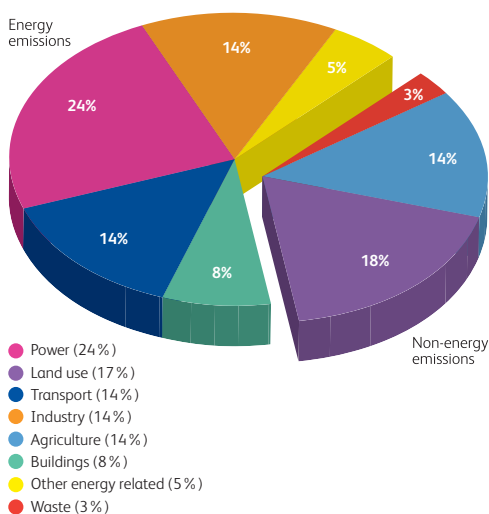


Figure 4.22 – Sources of Greenhouse Gases¹¹



Reducing greenhouse gas (GHG) emissions

Greenhouse Gas (GHG) emissions have continued to increase since 1990. Globally about 65 % come from energy consumption and industrial processes, 18 % from land use change (deforestation), and the remaining 17 % from agriculture and waste (Figure 4.22).

Deforestation and fossil fuel consumption primarily produce CO₂, while agriculture and waste are the main source of methane and nitrous oxide emissions. For the very poorest countries, most GHG emissions come from agriculture and changes in land use. When emissions from land use change are included, the top ten emitters account for two-thirds of CO₂ emissions, and include China, India, Brazil, Indonesia and Malaysia.⁴⁴

But in general, even taking into account land use change, the amount of GHGs emitted per capita are far higher in the developed than in the developing countries (Figures 4.23 and 4.25).

Figure 4.23 – CO₂ emissions from land use changes, 1850-2000¹¹

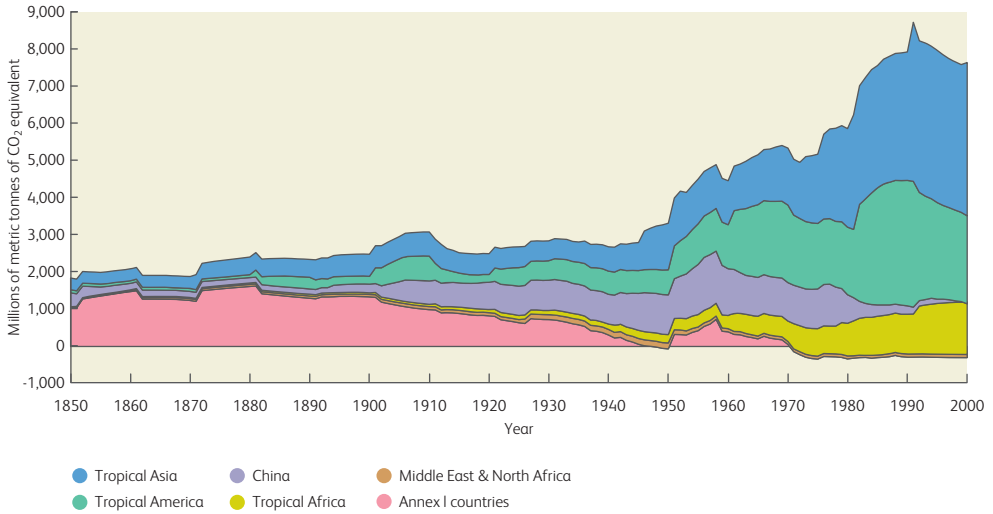
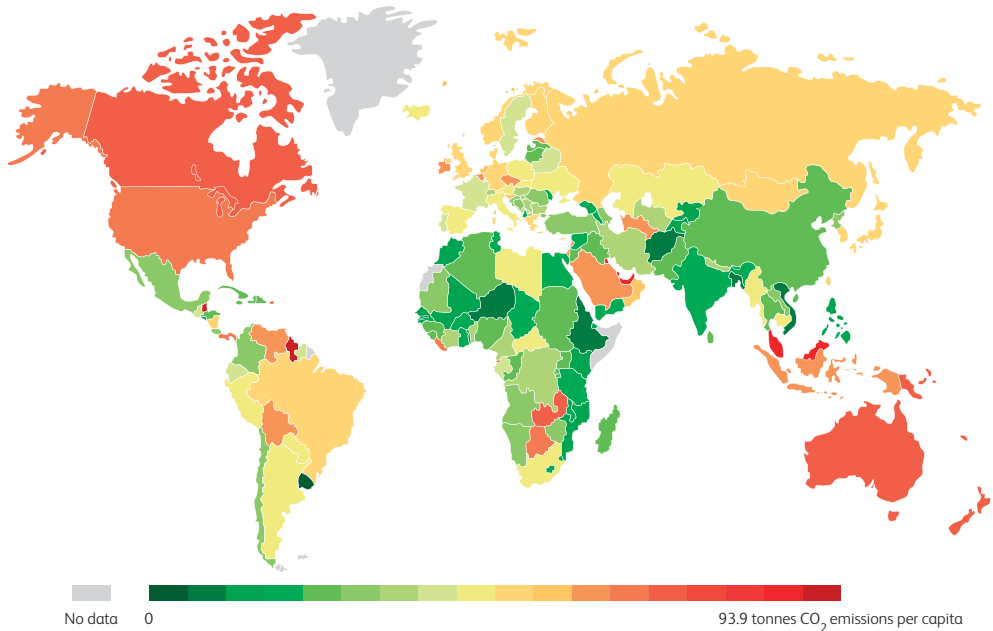


Figure 4.24 – Per capita GHG emissions including from changes in land use in 2000, ranging from zero tonnes CO₂ emissions/capita (dark green) to 93.9 tonnes CO₂ emissions/capita (dark red)⁴⁵



Carbon emissions by both high-income and developing countries are predicted to rise by over 60% by 2035 from 2004 levels under the A1FI scenario (see Chapter 8 for description of scenarios). Moreover, developing countries' CO₂ emissions from fossil fuels – as a whole – will soon equal those of high-income countries.

Reducing ozone depleting substances

One of the most remarkable achievements in recent years has been the reduction, by 97% between 1986 and 2007, in the consumption of substances that deplete the Earth's ozone layer (Figure 4.26).¹⁰

177 parties to the Montreal Protocol have put in place national regulations or legislation to promote effective protection of the ozone layer. In addition, the Montreal Protocol Multilateral Fund has supported national capacity-building which has helped to transfer essential technologies that enable developing countries to 'leapfrog' to new, energy-efficient technologies and export their wares to the global market. According to the UN this has come about because of the integration of sustainable development principles into national policy frameworks (MDG 7) and the funding from an appropriate global partnership for development (MDG 8).

The challenges that remain include the continued phasing out of chlorofluorocarbons (CFCs) and the less active transitional CFC replacements, hydrochlorofluorocarbons (HCFCs), while avoiding the use of alternative compounds with a high potential for global warming. Alternatives must also be developed for the few remaining uses of HCFCs for which no acceptable substitute has been found, such as the Halon fire suppression system used in aircraft. Finally, existing stocks of ozone-depleting substances must be destroyed.¹⁰

Reducing biodiversity loss

The second target under MDG 7 is to reduce the current rapid rate of biodiversity loss. If successful, it will secure the biological resource base on which much of our future agricultural, health and other scientific innovation depends. It will also maintain the integrity and functionality of terrestrial and marine ecosystems in which particular, often poorly known, species play key roles that cannot be easily replaced.

Figure 4.25 – The difference in emissions between low, middle and high-income countries as of 2005³⁸

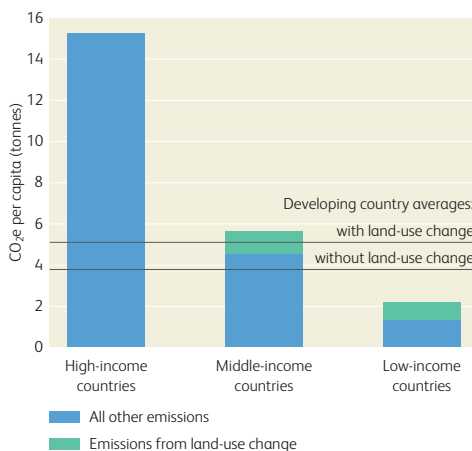
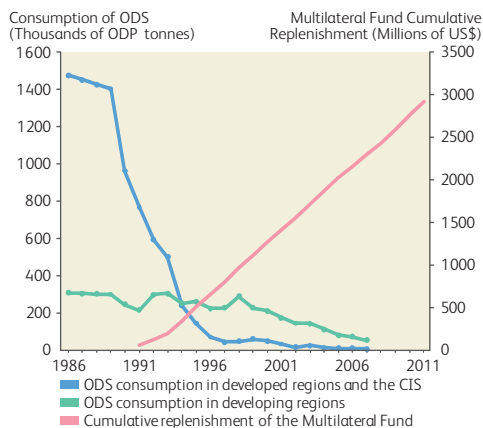


Figure 4.26 – Greatly reduced consumption of all ozone-depleting substances (ODS) funded by the Montreal Protocol Multilateral Fund¹⁰

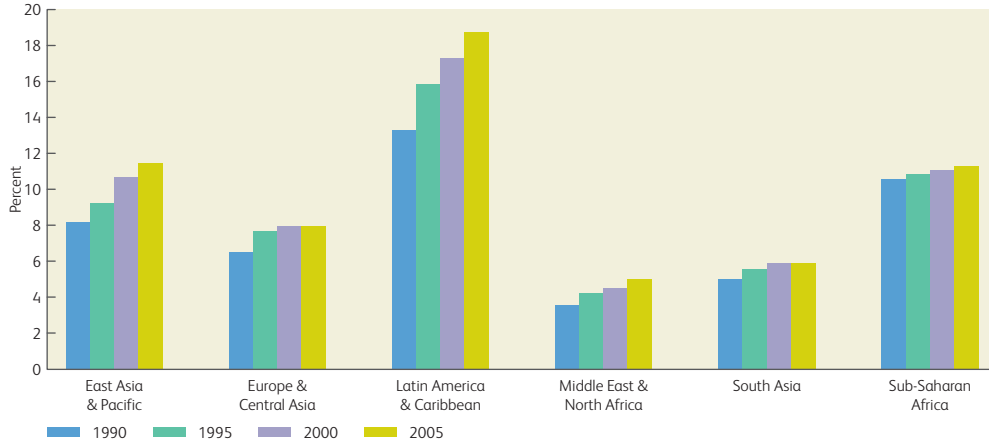


The target has two specific indicators, to:

- Increase the proportion of terrestrial and marine areas protected;
- Decrease the proportion of species threatened with extinction.

Despite significant increases in the protection of biodiversity areas the amount protected remains very low (Figure 4.27).

Figure 4.27 – Slow increase in the proportion of terrestrial and marine area protected¹¹



Only 12% of the planet is under some form of protection: about 18 million square kilometres of protected land and over three million square kilometres of protected territorial waters. Protected areas are also often poorly managed and suffer from pollution and climate change, irresponsible tourism, infrastructure development and increasing demands for land and water resources.¹⁰

Measuring the diversity of animals, plants and other organisms is inherently very difficult. Some progress has been made by the World Wildlife Fund (WWF) which summarises changes in populations of vertebrate species in its Living Planet Index (LPI). This tracks over 3,600 populations of 1,313 vertebrate species.⁴⁶



Figure 4.28 – Tropical rainforests are one of many threatened ecosystems

© Eskinder Debebe – UN Photo

Separate indexes are also computed for terrestrial, marine and freshwater organisms using data from a variety of sources, and for different biogeographic regions of the world. The LPI indicates a downward trend since 1970 with no signs of recovery (Figure 4.29)

Improving water supply and sanitation

Access to clean potable water and basic sanitation is a key target for human development. Over 880 million individuals lack access to safe drinking water and 2.5 billion individuals lack access to basic sanitation. Improvements in these two areas could help to reduce dramatically the burden of disease, particularly diarrhoea, which contributes to approximately 1.5 million childhood deaths annually.²³

The target is to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation. This is tracked by measuring the proportion of the population:

- Using an improved drinking water source;
- Using an improved sanitation facility.

Access to improved sources of water refers to the percentage of the population with reasonable access to a permanent source of safe water in their dwelling or within a reasonable distance from it. Access to sanitation refers to the percentage of the population with at least adequate access to excreta facilities (private or shared, but not public) that can effectively prevent human, animal and insect contact with excreta.

Lack of safe drinking water is more serious a problem for rural dwellers. A person living in an urban area of the developing world is more than twice as likely to have a piped drinking water supply, than a person living in a rural area. Nearly one quarter of the rural population obtain their drinking water from ‘unimproved’ sources: surface water such as lakes, rivers, dams or from unprotected dug wells or springs. But even using an improved water source is no guarantee that the water is safe from contamination.¹⁰

There has been significant progress in improving access to drinking water: Europe and Central Asia and South Asia have achieved the target for 2015 and East Asia and the Pacific have exceeded the target. The population with access has risen from 69% in 1990 to 87% in 2006. Sub-Saharan Africa is farthest from the target (Figure 4.31).

Figure 4.29 – Downward trend in the Living Planet Index for vertebrate animals¹¹

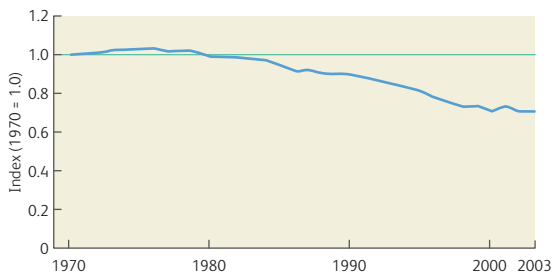
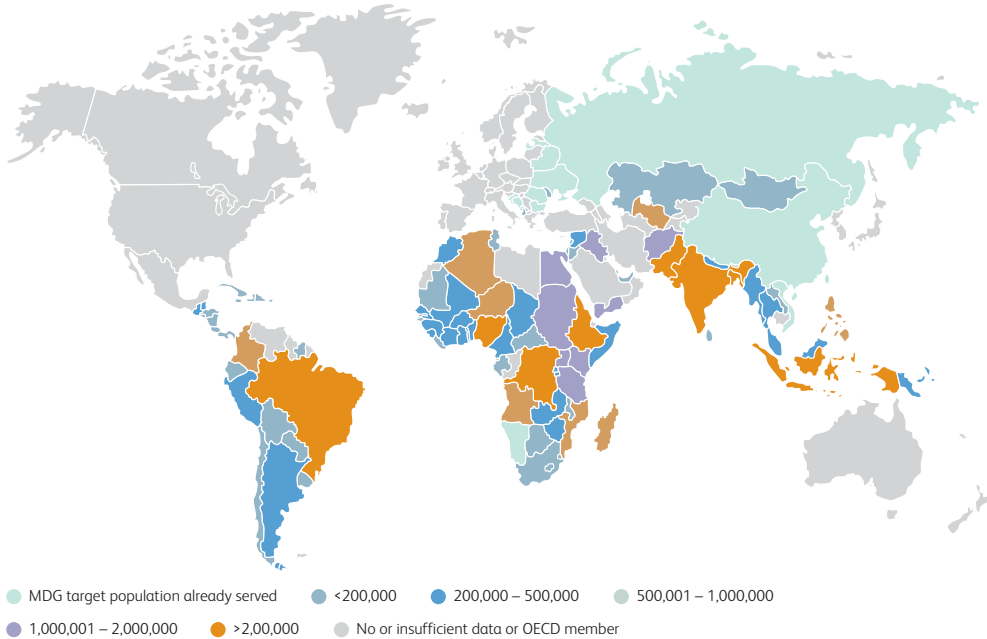


Figure 4.30 – Family collecting water from a local community pump in Mozambique

© Moira Hart

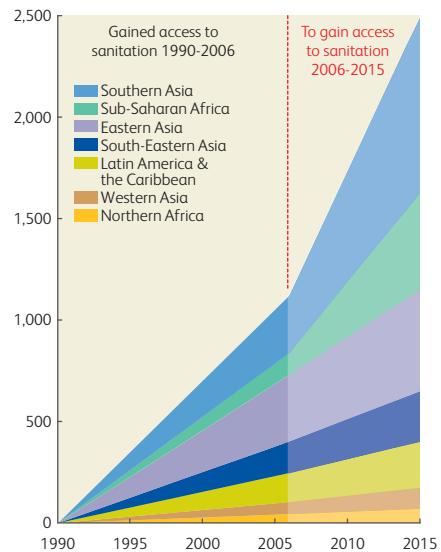
Figure 4.31 – Number of people per year requiring access to improved drinking water to reach the MDG target¹⁰



In 2006, 2.5 billion people worldwide were still without access to basic sanitation. 18% of the world’s population – 1.2 billion people – practice open defecation, the vast majority (87%) living in rural areas. The biggest challenges are in Southern Asia and Sub-Saharan Africa, but there has been significant progress. In Southern Asia, the population that gained access to an improved sanitation facility more than doubled since 1990; in Sub-Saharan Africa, it increased by over 80%.

While the indicators are for ‘use’ of improved water and sanitation facilities, this is in practice very difficult to measure. The target is therefore tracked in practice by the number of households with access – which is indeed the first step. However, particularly with sanitation facilities, access does not always lead to use. Long-standing hygiene habits are often hard to change, as will be discussed in later chapters, and this increases the difficulty of achieving this already challenging goal.

Figure 4.32 – Population that gained access to an improved sanitation facility 1990-2006 (millions) and population that needs to gain access to an improved sanitation facility to meet the MDG target, 2006-2015 (millions)¹⁰



Improving the lives of slum dwellers

The proportion of the global urban population in developing regions living in slum conditions, defined as a lack of access to one of four basic amenities, clean water, improved sanitation, durable housing and adequate living space, has reduced from almost half in 1990 to around 36 % in 2005. Much of this progress is due to expanded access to water and sanitation, especially in Asia. Continued urbanisation will make this target a continuing challenge and investments in appropriate low-cost infrastructure as well as enabling policies will be important for progress.¹⁰

6. Conclusion

As is abundantly clear there are no silver bullets which will attain the MDGs. Political commitment, good governance and sound macro-economic policies are essential. In this context good governance embraces a wide range of attributes – fair and democratic elections (at all levels), accountable, efficient and responsive government, protection of human rights, absence of abuse of power and a lack of corruption.

Economic growth is also crucial. The MDGs can, in many instances, be attained by donor funding but maintaining progress depends on local resources, government budgets and the private sector. In general, as incomes rise individuals can purchase food and afford health care.

Nevertheless many of the goals are dependant on the application of new or existing technologies and the natural sciences that underpin them.

For example, reducing hunger will continue to depend on the production of new crop varieties, livestock breeds and agricultural systems that give higher yields, better nutritional quality, reduce pest and disease attack, and are tolerant of heat and drought. It is also clear that although reasonably effective forms of intervention exist for most of the ‘killer diseases’ there will need to be further and continued development of vaccines and medicines and other forms of health intervention. Finally, environmental management will depend on scientists’ continued discovery and evaluation, often using new sensing technologies, of ecosystems and our effects on their functionality.

A more thorough analysis indicates that, in addition, when effective solutions do exist they are often not ideal and, in particular, are not in a form that can be easily implemented in developing countries. The need, therefore, is for interventions that are more efficient and user-friendly. We discuss these in the next three chapters.

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