

# GLOBAL HIV/AIDS RESPONSE

Epidemic update and health sector progress towards Universal Access

Progress Report **2011**

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World Health  
Organization



**UNAIDS**  
JOINT UNITED NATIONS PROGRAMME ON HIV/AIDS

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## ACKNOWLEDGEMENTS

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# Foreword

This documents the extraordinary progress achieved over the past decade in the health sector response to HIV. Access to evidence-informed HIV prevention, testing and counselling, treatment and care services in low- and middle-income countries has expanded dramatically. This progress demonstrates how countries can surmount seemingly intractable health and development challenges through commitment, investment and collective action.

The global incidence of HIV infection has stabilized and begun to decline in many countries with generalized epidemics. The number of people receiving antiretroviral therapy continues to increase, with 6.65 million people getting treatment at the end of 2010. Almost 50% of pregnant women living with HIV received effective antiretroviral regimens to prevent mother-to-child transmission, spurring the international community to launch the *Global Plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive*. What would have been viewed as wildly unrealistic only a few years ago is now a very real possibility.

Recent published evidence from clinical trials has confirmed the powerful impact antiretroviral drugs have on the epidemic as part of an effective package of options for HIV prevention. For the first time, the prospect of a microbicide that contains antiretroviral medicine is providing additional hope to the women in sub-Saharan Africa who continue to bear a disproportionate burden of the HIV epidemic in this region.

Despite these advances, still too many people are acquiring HIV infection, too many people are getting sick and too many people are dying. Of particular concerns are trends affecting Eastern Europe and Central Asia, where the numbers of people acquiring HIV infection and dying from HIV-related causes continue to increase.

New surveillance data confirm that the epidemic disproportionately affects sex workers, men who have sex with men, transgender people, people who inject drugs, prisoners and migrants in both concentrated and generalized epidemics. Too often national AIDS plans omit these people, who face formidable legal and other structural barriers to accessing HIV services. Globally, more than 50% of the people eligible for treatment do not have access to antiretroviral therapy, including many people living with HIV who are unaware of their HIV status. Children have much poorer access to antiretroviral therapy than do adults, and attrition at each stage in the cascade of care has highlighted the need to strengthen links within HIV services and with other areas of health and community systems.

Nevertheless, several critical developments over the past year have highlighted the capacity of the global response to innovate and learn from scientific and programmatic evidence. The Political Declaration on HIV/AIDS, adopted in June 2011 by the United Nations General Assembly, set ambitious targets aimed at achieving universal access and the health-related Millennium Development Goals by 2015. The WHO Global Health Sector Strategy on HIV/AIDS, 2011–2015, the UNAIDS 2011–2015 Strategy: Getting to Zero, and the UNICEF's strategic and programmatic focus on equity will help to guide national and global efforts to respond to the epidemic and move from an emergency response to a long-term, sustainable model of delivering HIV services. These strategies emphasize the need to better tailor national HIV responses to the local epidemics, to decentralize programmes to bring them closer to people in



need and to integrate with other health and community services to achieve the greatest impact. These are important developments aimed at consolidating gains to date and improving the quality, coverage and efficiency of HIV services.

The past decade has seen a historically unprecedented global response to the unique threat the HIV epidemic poses to human development. Networks of people living with and affected by HIV, as well as civil society organizations, have continued to work with other partners, to demand and mobilize political leadership. This has led to increased funding, technical innovation and international collaboration that has saved millions of people's lives and changed the trajectory of the epidemic. As capacity at all levels increases, programmes are becoming more effective and efficient. Nevertheless, financial pressures on both domestic and foreign assistance budgets are threatening the impressive progress to date. Recent data indicating that HIV funding is declining is a deeply troubling trend that must be reversed for the international community to meet its commitments on HIV.

HIV has proven to be a formidable challenge, but the tide is turning. The tools to achieve an AIDS-free generation are in our hands. Let us move forward together on the ambitious goals set for 2015 and bring us closer to realizing our collective vision of zero new HIV infections, zero discrimination and zero AIDS-related deaths.



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# Introduction

This report reviews progress made until the end of 2010 in scaling up access to health sector interventions for HIV prevention, treatment, care and support in low- and middle-income countries. It is the fifth in a series of annual progress reports published since 2006 by the World Health Organization (WHO), United Nations Children's Fund (UNICEF) and Joint United Nations Programme on HIV/AIDS (UNAIDS), in collaboration with national and international partners, to monitor key components of the health sector response to the HIV epidemic. The report reflects the commitment of United Nations Member States, civil society and United Nations agencies to ensure accountability for global progress

in the response to HIV through regular monitoring and reporting. Since 2010 was the deadline established in 2005 for achieving universal access to HIV prevention, treatment, care and support, this report also represents an important benchmark, an opportunity to take stock and identify both achievements and outstanding gaps and to take a constructive look forward in the response at this critical point in the response to the HIV epidemic.

The results of commitment, investment and collaboration over the past decade have translated into substantial improvements in access to evidence-informed HIV prevention, diagnosis, treatment, care and support interventions in the health sector (Table 1.1).

**Table 1.1** Key indicators for the HIV epidemic, 2002–2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of people living with HIV (in millions)	29.5 [27.7–31.7]	30.2 [28.4–32.1]	30.7 [28.8–32.5]	31.0 [29.2–32.7]	31.4 [29.6–33.0]	31.8 [29.9–33.3]	32.3 [30.4–33.8]	32.9 [31.0–34.4]	34.0 [31.6–35.2]
Number of people newly infected with HIV (in millions)	3.1 [3.0–3.3]	3.0 [2.8–3.1]	2.9 [2.7–3.0]	2.8 [2.6–3.0]	2.8 [2.6–2.9]	2.7 [2.5–2.9]	2.7 [2.5–2.9]	2.7 [2.5–2.9]	2.7 [2.4–2.9]
Number of people dying from AIDS-related causes (in millions)	2.0 [1.8–2.3]	2.1 [1.9–2.4]	2.2 [2.0–2.5]	2.2 [2.1–2.5]	2.2 [2.1–2.4]	2.1 [2.0–2.3]	2.0 [1.9–2.2]	1.9 [1.7–2.1]	1.8 [1.6–1.9]
% of pregnant women tested for HIV <sup>a</sup>				8%	13%	15%	21%	26%	35%
Number of facilities providing antiretroviral therapy <sup>a</sup>						7 700	12 400	18 600	22 400
Number of people receiving antiretroviral therapy <sup>a</sup>	300 000	400 000	700 000	1 330 000	2 034 000	2 970 000	4 053 000	5 255 000	6 650 000
Number of children receiving antiretroviral therapy <sup>a</sup>				71 500	125 700	196 700	275 400	354 600	456 000
Coverage of antiretroviral medicines for preventing mother-to-child transmission (%) <sup>a</sup>			9% <sup>b</sup>	14% <sup>b</sup>	23% <sup>b</sup>	33% <sup>b</sup>	43% <sup>b</sup>	48% <sup>b</sup>	48% <sup>c</sup>

a In low- and middle-income countries.

b The coverage data includes provision of single-dose nevirapine which is no longer recommended by WHO.

c This data does not include single-dose nevirapine regimen which is no longer recommended by WHO. It should not be compared with the previous years. When including single-dose nevirapine, the coverage in 2010 is 59%.

- A total of 2.7 million people acquired HIV infection in 2010, down from 3.1 million in 2001, contributing to the total number of 34 million people living with HIV in 2010 (see Chapter 2).
- Access to HIV testing and counselling is increasing: coverage of HIV testing and counselling among pregnant women rose from 8% in 2005 to 35% in 2010. Nevertheless, the majority of people living with HIV in low- and middle-income countries still do not know their serostatus (see Chapter 4).
- The number of health facilities providing antiretroviral therapy, a key indicator of expanded health system capacity to deliver treatment, expanded from 7700 in 2007 to 22 400 at the end of 2010, a threefold increase (see Chapter 5).
- Access to antiretroviral therapy in low- and middle-income countries increased from 400 000 in 2003 to 6.65 million in 2010, 47% coverage of people eligible to treatment, resulting in substantial declines in the number of people dying from AIDS-related causes during the past decade (Fig. 1.1). Mounting scientific evidence suggests that increased access to antiretroviral therapy is also contributing substantially to declines in the number of people acquiring HIV infection.
- The number of children receiving antiretroviral therapy increased from 71 500 at the end of 2005 to 456 000 in 2010. Nevertheless, the 23% coverage of children is a substantial gap to the coverage of adults.
- Coverage of pregnant women receiving the most effective antiretroviral regimens to prevent mother-to-child transmission of HIV (excluding single-dose nevirapine) is estimated at 48% in 2010 (see Chapter 7).

### **Building foundations: political commitment, investment and technical innovation**

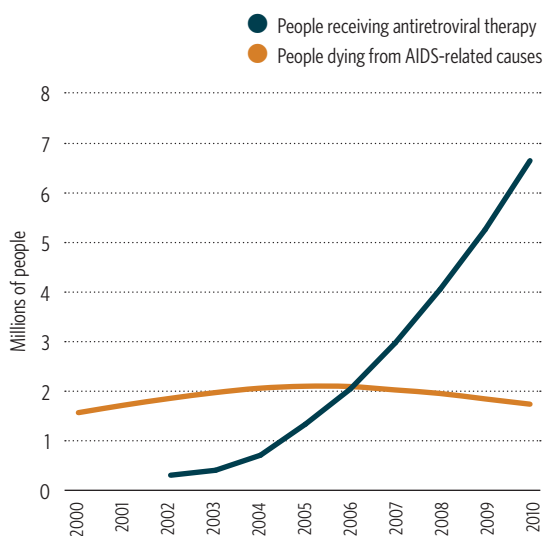
At the beginning of the 21st century, the international community faced formidable health and development challenges, none more so than countries in the poorest region of the world: sub-Saharan Africa. A rapidly expanding HIV epidemic was already dramatically reversing decades of progress on key development indicators, such as infant mortality and life expectancy (1). Although the global incidence of HIV infection had peaked in the mid-1990s, more than 3 million people were being newly infected per year,

AIDS had become one of the leading causes of adults dying in sub-Saharan Africa and the full onslaught of the epidemic would not be felt until 2006, when more than 2.2 million people died each year from AIDS-related causes (2,3). The revolution in HIV treatment brought about by combination antiretroviral therapy in 1996 had forever altered the course of disease among those living with HIV in high-income countries but had only reached a fraction of people in low and middle-income countries, which bore 90% of the global HIV burden (1).

At the XIII International AIDS Conference in July 2000 in Durban, South Africa, activists, community leaders, scientists and health care providers joined forces to demand access to treatment and an end to the enormous health inequities between the global North and global South. Months later, world leaders established the Millennium Development Goals, a series of ambitious, time-bound targets aimed at achieving progress on several health and development goals over the next 15 years, including Millennium Development Goal 6: combat HIV, malaria and other diseases (4). In 2001, the United Nations General Assembly Special Session on HIV/AIDS (UNGASS) approved the Declaration of Commitment on HIV/AIDS, with common targets in specific technical areas, such as expanding access to antiretroviral therapy, antiretroviral prophylaxis to prevent the mother-to-child transmission of HIV and HIV prevention. The Declaration also committed Member States to establish a dedicated global health fund to finance the HIV response, resulting in the launch of the Global Fund to Fight AIDS, Tuberculosis and Malaria one year later: The Global Fund quickly became a cornerstone in the global response to HIV, funding country-led responses through a pioneering, performance-based grant system. In 2003, the United States Government announced the United States President's Emergency Plan for AIDS Relief. At US\$ 15 billion over five years, it was the largest single funding commitment for a disease in history. The United States President's Emergency Plan for AIDS Relief was reauthorized in 2008 for up to US\$ 48 billion to combat AIDS, TB and malaria for 2009–2013.

Additional innovations in global health funding followed. By 2006, Brazil, Chile, France, Norway and the United Kingdom had agreed to create UNITAID, an international drug purchase facility financed through a modest levy on airline tickets. UNITAID now finances

**Fig. 1.1** Number of people with access to antiretroviral therapy and the number of people dying from AIDS-related causes, low- and middle-income countries, 2000-2010



and supports strategic interventions in the drugs and diagnostics markets in 94 countries (5).

Increased political and financial commitments to the HIV response developed in parallel with normative guidance and strategic technical innovations, including a ground-breaking approach to scaling up treatment access in low- and middle-income countries: the public health approach to antiretroviral therapy (6). Key elements of the public health approach include using standardized treatment protocols and drug regimens, simplified clinical monitoring, maximizing coverage with limited resources, optimizing human resources for health and involving people living with and affected by HIV in designing and rolling out antiretroviral therapy programmes (7).

### Scaling up the global HIV response

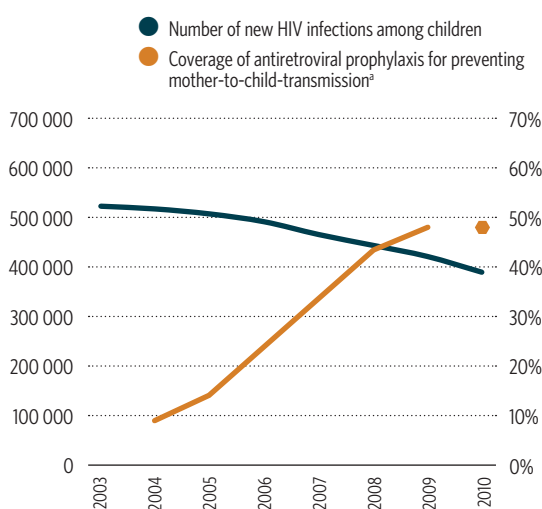
When WHO and UNAIDS launched the “3 by 5” Initiative on World AIDS Day in 2003, only 400 000 people in low- and middle-income countries had access to antiretroviral therapy (8). The “3 by 5” Initiative, which set a target of obtaining access to antiretroviral therapy for 3 million people by the end of 2005, led a fundamental shift in thinking about the feasibility of funding and delivering antiretroviral medicines and other drugs for people in resource-limited settings. The rapid scale-up of antiretroviral therapy in low- and middle-income countries, especially during the past five

years, has significantly reduced the number of people dying from AIDS-related causes (Fig. 1.1).

By the middle of the last decade, another benchmark was established when G8 leaders – and later all United Nations Member States – endorsed the goal of achieving universal access to a package of HIV prevention, care, treatment and support interventions for everyone who needs them (9). By the end of 2005, the number of people receiving antiretroviral therapy in low- and middle-income countries had jumped to more than 1.4 million. Progress on Millennium Development Goal 6 and UNGASS targets accelerated in the second half of the decade; guidelines on preventing mother-to-child-transmission and on care for children, antiretroviral therapy, provider-initiated testing and counselling and medical male circumcision were released. The 2010 WHO recommendations on antiretroviral therapy (10) reflect clinical evidence that early initiation of antiretroviral therapy (recommended at CD4 cell counts less than 350 per mm<sup>3</sup>) significantly reduces morbidity and mortality and also has important preventive benefits.

The “3 by 5” target was met in 2007, and by the end of 2010 the number of people receiving treatment in low- and middle-income countries had reached 6.65 million, an increase of more than 16-fold in seven years (see Chapter 5). The trends are similar in access to antiretroviral medicine for preventing mother-to-

**Fig. 1.2** Coverage of antiretroviral prophylaxis for preventing the mother-to-child-transmission of HIV and the number of new HIV infections among children, low- and middle-income countries, 2003-2010



<sup>a</sup> Coverage before 2010 includes single-dose nevirapine, which is no longer recommended by WHO. Coverage in 2010 does not include single dose nevirapine.

child-transmission, enabling 350 000 infants to avoid HIV infection since 1995 (see Chapter 7) (Fig. 1.2).

Uptake of HIV testing and counselling, which is critical to ensuring appropriate referral to prevention and treatment services, also increased from about 64 million tests in 2009 to 72 million in 2010 (in 87 reporting countries). In eastern and southern Africa, the subregion with the highest number of pregnant women living with HIV, testing and counselling coverage among pregnant women increased from 14% to 61% between 2005 and 2010, and the number of facilities providing antiretroviral therapy in low- and middle-income countries – a key measure of the capacity of the health systems to scale up to meet the demand for treatment – increased from less than 7700 in 2005 to 22 300 in 2010, a three-fold increase.

Although there has been concern that investment to date has not adequately addressed the constraints of health system, a 2009 study (11) indicated that – on balance – HIV investment has strengthened the capacity of health systems, partly by introducing important innovations in how health services are funded and delivered. The grant architecture of the Global Fund to Fight AIDS, Tuberculosis and Malaria, for example, has evolved to address structural deficits in health system capacity. The past few years have also seen evolution in thinking about how to better integrate HIV services with other areas of the health sector, including maternal, newborn and child health, sexual and reproductive health, drug dependence treatment and harm reduction (including opioid substitution therapy), tuberculosis and primary health care. In addition, approaches to task-shifting or task-sharing in countries are contributing to improving the productivity of scarce human resources for health.

Nevertheless, significant challenges remain. Although the annual number of people newly infected with HIV has dropped since their peak in the late 1990s, this is still occurring at an unacceptably high rate: between 2.5 and 3 million people annually for the past five years, adding to the global number of people living with HIV that reached 34 million [31 600 000–35 200 000] by the end of 2010 (see Chapter 2). Reductions in the number of people acquiring HIV infection, especially people 15–24 years old in the countries in sub-Saharan Africa that have a high burden of HIV, have been offset by increases in new infections in Eastern Europe and Central Asia, where the primary mode of transmission

is among people who inject drugs and their sexual networks and where the number of people dying from AIDS-related cause increased 1100% during the past decade: from an estimated 7800 in 2001 to 89 500 in 2010 (see Chapter 2) (12).

Although HIV testing and counselling uptake has improved, many people living with HIV in low- and middle-income countries still do not know their HIV status, undercutting efforts to reduce onward transmission and refer those testing HIV-positive to appropriate care and treatment; an estimated 7.5 million people are eligible for treatment but are not accessing antiretroviral therapy because they are unaware of their HIV serostatus. Although provider-initiated testing and counselling has led to dramatic increases in the number of people living with HIV diagnosed in the symptomatic stages of HIV disease, testing based in health facilities is unlikely to identify people at earlier, asymptomatic stages of infection (above 200 CD4 cells per mm<sup>3</sup>). Novel approaches to community-based testing are therefore urgently needed (see Chapter 4).

For children, the situation is even graver, since less than one quarter of the children eligible for treatment are accessing antiretroviral therapy. Attrition rates of 20% or more 12 months after people start receiving antiretroviral therapy in many programmes indicate the need for intensified efforts and strategies to initiate treatment earlier, retain individuals in care (see Chapter 5) and increase the quality of interventions.

Women, especially young women, remain disproportionately affected in sub-Saharan Africa, highlighting the need to address gender inequity and harmful gender norms as a central component of the global response to HIV (13). Key populations at higher risk of HIV infection and transmission, including people who inject drugs, men who have sex with men, transgender people, sex workers, prisoners and migrants continue to be underserved by current HIV services and often have the highest HIV prevalence in areas with both generalized and concentrated epidemics (see Chapter 2) (12). Despite the commitments made in the 2001 and 2006 UNGASS declarations to respect the human rights of key populations at higher risk, these groups continue to face violence, social stigma and poor access to HIV services in many settings, a situation compounded by laws that criminalize homosexuality, drug use and sex work.

Domestic and international HIV-specific funding has decreased from US\$15.9 billion in 2009 to US\$ 15 billion in 2010, well below the estimated US\$ 22–24 billion needed in 2015 for a comprehensive, effective global response to HIV (14,15).

The past decade has witnessed fundamental changes in the approach to global public health challenges. The results have been demonstrated in both human and economic terms. A 2011 study (16) indicated that investment in antiretroviral therapy programmes to date is significantly influencing increased economic activity and labour force productivity in low- and middle-income countries, reaching total gains of up to US\$ 34 billion and 18.5 million life-years by 2020, more than offsetting the costs of antiretroviral therapy programmes. Introducing antiretroviral therapy has averted 2.5 million deaths in low- and middle-income countries globally since 1995 (Chapter 2). Nevertheless, at a time when mounting evidence indicates that political and financial commitments in the first decade of the 21st century are paying enormous dividends, concerns are growing about the sustainability of the response, the continued upward trajectory of costs and the millions still in need. The data in this report confirm that, although important and substantial progress has been made, only 10 low- and middle-income countries, including 3 with generalized epidemics, achieved the universal access target for antiretroviral therapy (80% coverage) in 2010.

## The roadmap to 2015

Budgetary constraints in the aftermath of the 2008 recession and the ongoing volatility in the global economy are threatening hard-won gains and underscore the need to reduce commodity costs and maximize efficiency in how HIV programmes are funded and implemented.

A new investment framework seeks to ensure a more strategic funding approach that includes both the need for additional funding and a fundamentally different approach to designing programmes and delivering services, focusing on a core set of basic programmatic activities, critical enablers and developmental synergy. The investment framework grounds the global HIV response more firmly in evidence-informed interventions that should be universally applied for greatest impact and in local

epidemiology (Box 1.1) (15). The Treatment 2.0 initiative, launched by WHO and UNAIDS in 2010, is continuing the drive for optimizing and innovating treatment in the key areas of drug regimens, point-of-care diagnostics, integrated and decentralized delivery of HIV services (17,18) and mobilizing communities (17). The 2010 WHO recommendations on antiretroviral therapy reflect clinical evidence that initiating antiretroviral therapy early (recommended at CD4 cell counts less than 350 mm<sup>3</sup>) significantly reduces morbidity and mortality and also has significant benefits in preventing HIV infection and TB (10). Recent scientific breakthroughs have confirmed the significant effects of prevention interventions based on antiretroviral medicine as part of combination prevention, including oral pre-exposure prophylaxis, topical microbicides and treatment as prevention (19–21).

UNAIDS and WHO have released five-year strategies (2011–2015), aimed at building on the progress to date and establishing ambitious new targets for 2015: zero new infections, zero discrimination and zero AIDS-related deaths (22,23). The Global Health Sector Strategy on HIV/AIDS, 2011–2015 (23), endorsed by all WHO Member States in May 2011, guides national HIV responses in the health sector and outlines the role of WHO and other partners in achieving the 2015 targets. The strategy focuses on four strategic directions: optimizing HIV prevention, diagnosis treatment and care; leveraging broader health outcomes through HIV responses; building strong and sustainable health and community systems; and reducing vulnerability and removing structural barriers to accessing services. Success in scaling up access to antiretroviral therapy and antiretroviral prophylaxis to prevent mother-to-child-transmission of HIV has driven the recent commitment among United Nations Member States, civil society and United Nations Agencies, co-convened by UNICEF and WHO, to establish a global plan aimed at eliminating new HIV infections among children and improving maternal health through intensified, country-led action and resource mobilization (24).

The 2011 Political Declaration on HIV/AIDS builds on the enormous progress made during the past decade, establishing bold and ambitious targets for 2015 (26). The Declaration acknowledges the challenges faced by countries in achieving universal access by the original 2010 deadline and commits to intensified efforts to reach universal access and Millennium Development Goal targets. For the first time in the

### Box 1.1

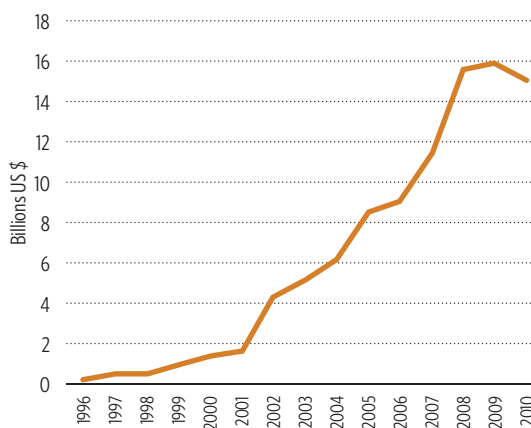
#### Towards an improved investment approach for an effective global HIV response

At the end of 2010, about US\$ 15 billion was available to scale up HIV services worldwide, split almost evenly between international and domestic sources (Fig. 1.3). But international assistance has declined from US\$ 8.7 billion in 2009 to US\$ 7.6 billion in 2010. More than 70% of international donor government disbursements for HIV programmes were channelled bilaterally, and the remainder was allocated primarily through UNITAID and the Global Fund to Fight AIDS, Tuberculosis and Malaria. After years of considerable increases, international funding for HIV programmes actually fell in 2010.

The investment framework promotes setting priorities for the efforts based on a nuanced understanding of country epidemiology and context and calls for evidence-informed activities that directly reduce HIV transmission, morbidity and mortality to be scaled up according to the size of the relevant affected populations.

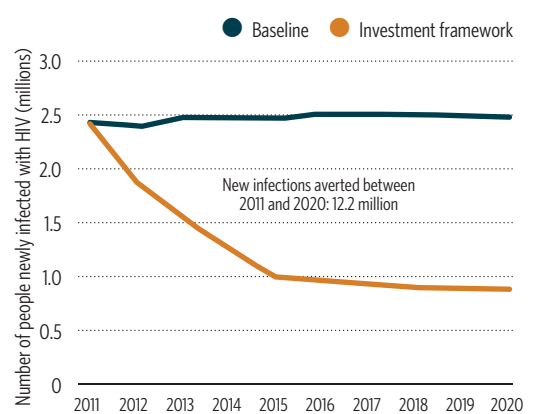
Annual resource needs to deliver on this optimized approach should peak at US\$ 22–24 billion in 2015, when universal access is achieved, and should subsequently decline, along with HIV transmission, morbidity and mortality rates. By 2020, the return on this comprehensive investment framework would be 12 million fewer people newly infected with HIV than would be possible with current funding levels and 7.4 million fewer people dying from AIDS-related causes (Fig. 1.4).

**Fig. 1.3** Global resources available for HIV programmes in low- and middle-income countries, billions of US dollars, 2002–2010



Source: UNAIDS World AIDS Day report 2011 (25).

**Fig. 1.4** Annual number of people newly infected with HIV, 2011–2020 baseline scenario and optimized investment framework



more than 30 years since the epidemic emerged, the international community can see success on the horizon. Scientific advances, committed leadership and strategic investment will yield a long-term, sustainable response to HIV that also strengthens synergy with other health and development goals. The hard-won progress during the past decade has proven what can be achieved through collective action on common goals. In an era dominated by economic crises and fiscal constraints, the HIV response continues to provide examples of how focused and smart investment can reap enormous human, economic and social benefits. Countries and communities enter the fourth decade with HIV at a crossroads. Although the challenges are daunting, the road to success is clear.

This report is structured as follows.

**Chapter 1** outlines the purpose of the report and reviews and analyses global progress towards universal access during the past decade.

**Chapter 2** provides updated epidemiological information on the HIV epidemic, including global and regional trends in incidence, prevalence and mortality from AIDS-related causes.

**Chapter 3** reviews progress in scaling up health sector interventions for HIV prevention in the general population.

**Chapter 4** presents global progress in expanding the availability and uptake of HIV testing and counselling.

**Chapter 5** presents global progress in scaling up access to treatment and care for people living with HIV and highlights recent efforts to optimize treatment through the Treatment 2.0 initiative.

**Chapter 6** presents global progress towards scaling up HIV services for key populations at higher risk of HIV infection and transmission.

**Chapter 7** reviews progress in scaling up HIV services for women and children, including eliminating mother-to-child transmission and improving maternal and child health.

**Chapter 8** identifies the main challenges and the way forward towards achieving universal access to HIV prevention, treatment, care and support.

The statistical annexes and explanatory notes at the end of this report provide supplementary information on data sources and methods.



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# KEY FINDINGS

## Update on the HIV epidemic

At the end of 2010, an estimated 34 million people (31 600 000–35 200 000) were living with HIV globally, including 3.4 million [3 000 000–3 800 000] children less than 15 years. There was 2.7 million [2 400 000–2 900 000] new HIV infections in 2010, including 390 000 [340 000–450 000] among children less than 15 years.

Globally, the annual number of people newly infected with HIV continues to decline, although there is stark regional variation. In sub-Saharan Africa, where most of the people newly infected with HIV live, an estimated 1.9 million [1 700 000–2 100 000] people became infected in 2010. This was 16% fewer than the estimated 2.2 million [2 100 000–2 400 000] people newly infected with HIV in 2001 and 27% fewer than the annual number of people newly infected between 1996 and 1998, when the incidence of HIV in sub-Saharan Africa peaked overall.

The annual number of people dying from AIDS-related causes worldwide is steadily decreasing from a peak of 2.2 million [2 100 000–2 500 000] in 2005 to an estimated 1.8 million [1 600 000–1 900 000] in 2010. The number of people dying from AIDS-related causes began to decline in 2005–2006 in sub-Saharan Africa, South and South-East Asia and the Caribbean and has continued subsequently.

In 2010, an estimated 250 000 [220 000–290 000] children less than 15 died from AIDS-related causes, 20% fewer than in 2005.

Not all regions and countries fit the overall trends, however. The annual number of people newly infected with HIV has risen in the Middle East and North Africa from 43 000 [31 000–57 000] in 2001 to 59 000 [40 000–73 000] in 2010. After slowing drastically in the early 2000s, the incidence of HIV infection in Eastern Europe and Central Asia has been accelerating again since 2008.

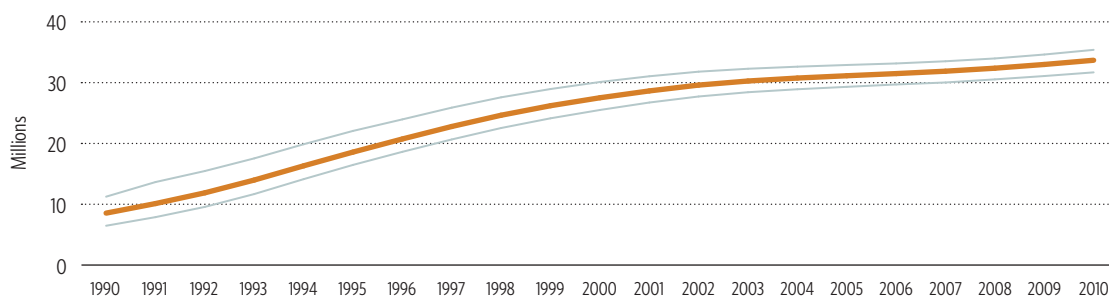
The trends in AIDS-related deaths also differ. In Eastern Europe and Central Asia, the number of people dying from AIDS-related causes increased more than 10-fold between 2001 and 2010 (from about 7800 [6000–11 000] to 90 000 [74 000–110 000]). In the same period, the number of people dying from AIDS-related causes increased by 60% in the Middle East and North Africa (from 22 000 [9700–38 000] to 35 000 [25 000–42 000]) and more than doubled in East Asia (from 24 000 [16 000–45 000] to 56 000 [40 000–76 000]).

Introducing antiretroviral therapy has averted 2.5 million deaths in low- and middle-income countries globally since 1995. Sub-Saharan Africa accounts for the vast majority of the averted deaths: about 1.8 million.

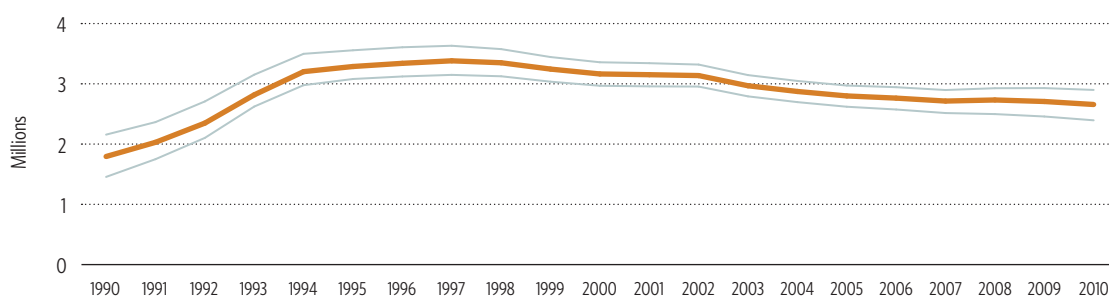
Providing antiretroviral prophylaxis to pregnant women living with HIV has prevented more than 350 000 children from acquiring HIV infection since 1995. Eighty-six per cent of the children who avoided infection live in sub-Saharan Africa, the region with the highest prevalence of HIV infection among women of reproductive age.

## 2.1 Global overview

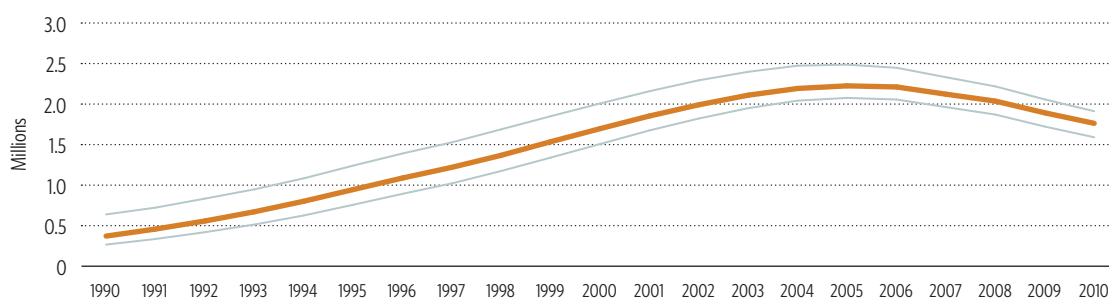
**Fig. 2.1** Number of people living with HIV globally, 1990-2010



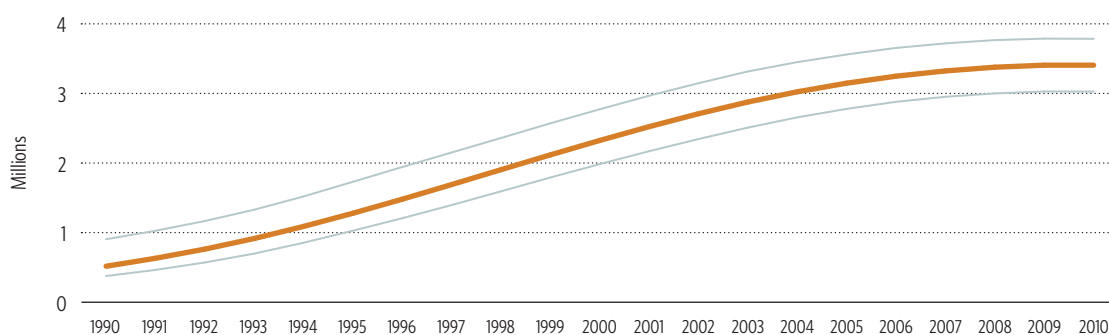
**Fig. 2.2** Number of people newly infected with HIV globally, 1990-2010



**Fig. 2.3** Number of people dying from AIDS-related causes globally, 1990-2010



**Fig. 2.4** Number of children 0-14 years old living with HIV globally, 1990-2010



### 2.1.1 HIV incidence continues to decline

Globally, the annual number of people newly infected with HIV continues to decline, although this varies strongly between regions.

In 2010, an estimated 2.7 million [2 400 000–2 900 000] people were newly infected with HIV, 15% fewer than the 3.1 million [3 000 000–3 300 000] people newly infected in 2001 and more than one fifth (21%) fewer than the estimated 3.4 million [3 100 000–3 600 000] in 1997, the year when the number of people newly infected with HIV peaked (Fig. 2.1–2.4).

Between 2001 and 2009, the incidence of HIV infection has declined in 33 countries, 22 of them in sub-Saharan Africa. In that region, which continues to have the majority of the people newly infected with HIV, an estimated 1.9 million [1 700 000–2 100 000] people became infected in 2010. This was 16% fewer than the estimated 2.2 million [2 100 000–2 400 000] people newly infected with HIV in 2001 and 26% fewer than the annual number of people newly infected in 1997 (when the overall HIV incidence in sub-Saharan Africa peaked).

In South and South-East Asia, the estimated 270 000 [230 000–340 000] people newly infected with HIV in 2010 were 40% fewer than the 470 000 [410 000–530 000] people estimated to have acquired HIV infection in 1996, when the epidemic in that subregion peaked.

These trends reflect a combination of factors: the natural course of HIV epidemics, behavioural changes associated with greater awareness about the effects of the epidemics and with intensified prevention efforts and increasing coverage of antiretroviral therapy.

#### HIV prevalence is declining among young people

Encouraging trends are evident among young people in several countries with a great burden of HIV. HIV prevalence trends among young people can indicate

recent trends in people acquiring HIV infection, since most young people living with HIV have been infected in the previous few years.

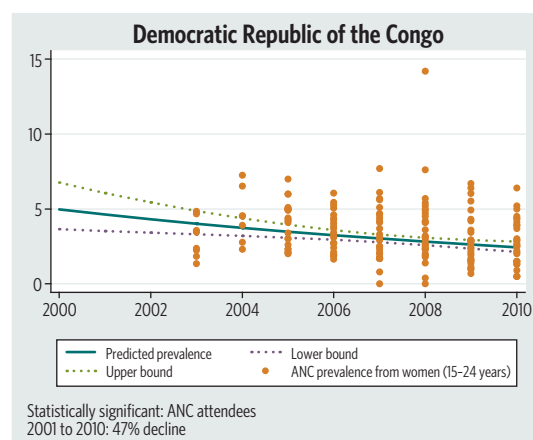
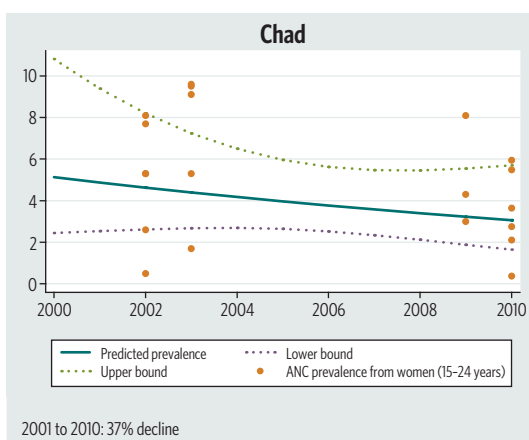
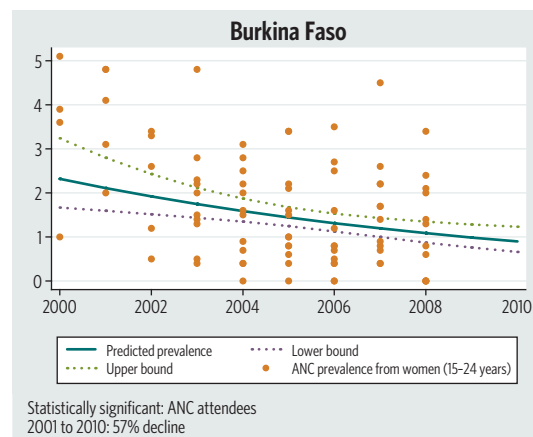
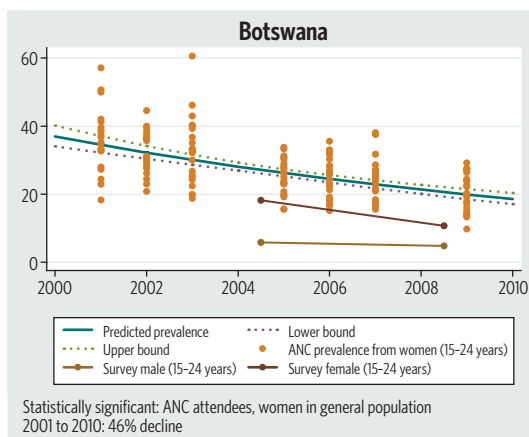
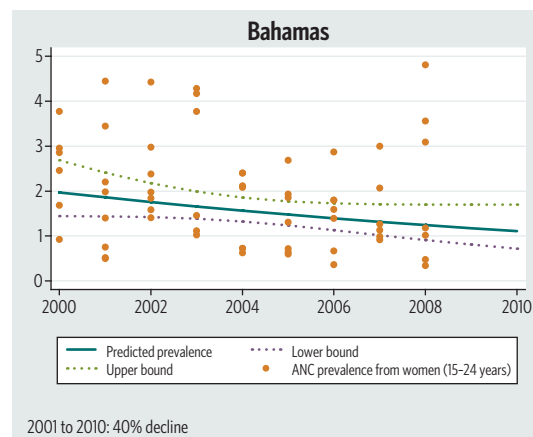
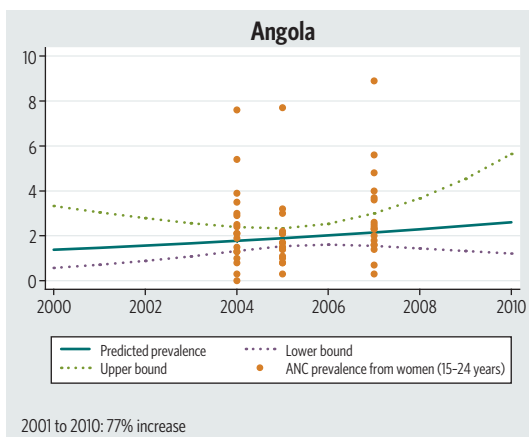
A regression model was applied to antenatal clinic data from 2000 to 2010 to estimate HIV prevalence trends among young people. It showed that the HIV prevalence declined among women 15–24 years old in 22 of the 24 countries with a national HIV prevalence of 1% or higher and with data available.<sup>1</sup> The decline in HIV prevalence was statistically significant among pregnant women attending antenatal clinics in 12 of these countries: Burkina Faso, Botswana, Democratic Republic of the Congo, Ethiopia, Ghana, Kenya, Malawi, Nigeria, Namibia, Togo, United Republic of Tanzania and Zimbabwe. Four of these countries (Botswana, Malawi, United Republic of Tanzania and Zimbabwe) also had statistically significant declines in the general population based on the results from population-based surveys (among women in Botswana, Malawi and Zimbabwe and among men in the United Republic of Tanzania). Three other countries had statistically significant declines within the general population but no significant declines among antenatal clinic attendees (among women in Zambia and among men in Lesotho and South Africa).

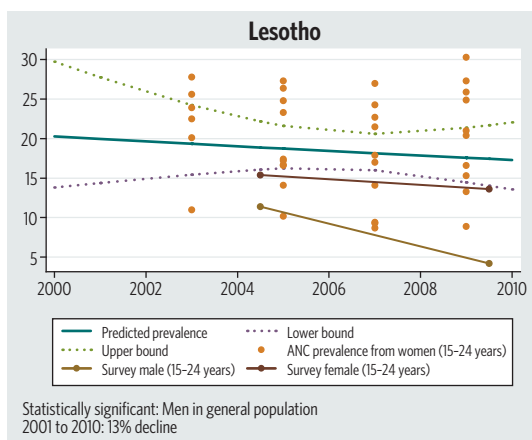
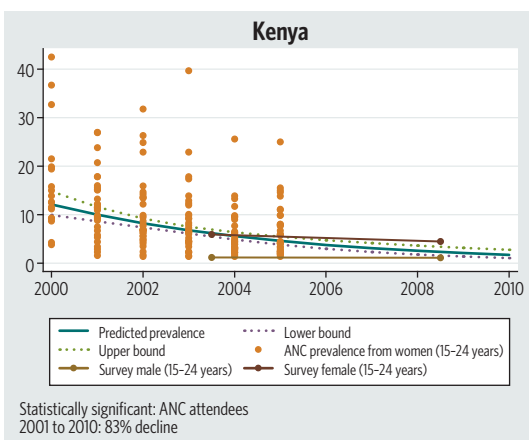
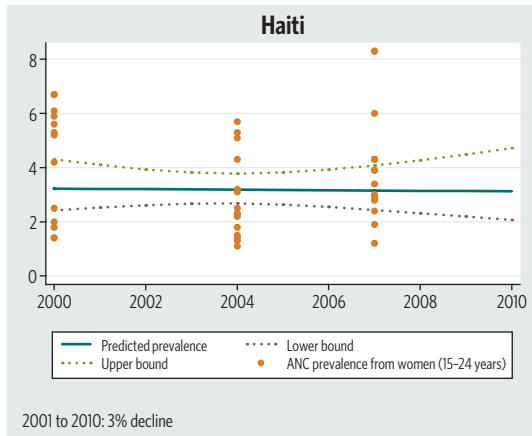
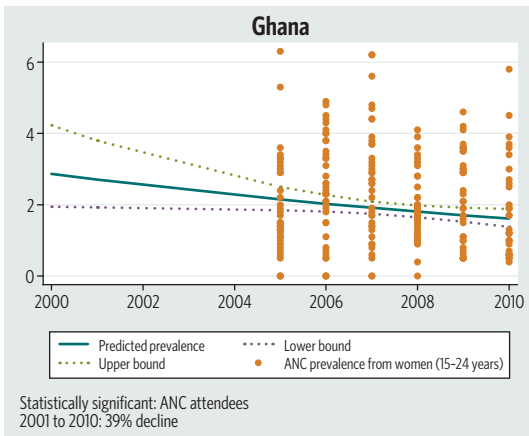
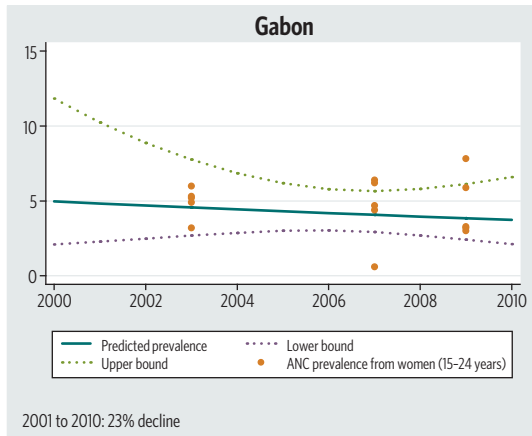
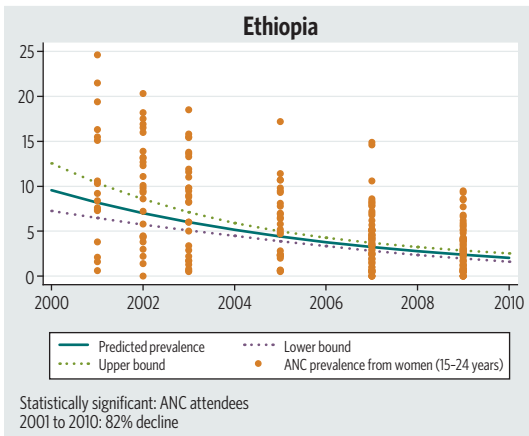
Among the 24 countries, the average decline in prevalence was 31% among pregnant women attending antenatal clinics (Fig. 2.5). The range, however, was wide: from an increase exceeding 50% in Angola to a decline exceeding 70% in Ethiopia and Kenya. Seven of the 24 countries achieved the 50% reduction in HIV prevalence, but there was no apparent decline in five others, including in South Africa, which has the largest HIV epidemic in the world.<sup>2</sup>

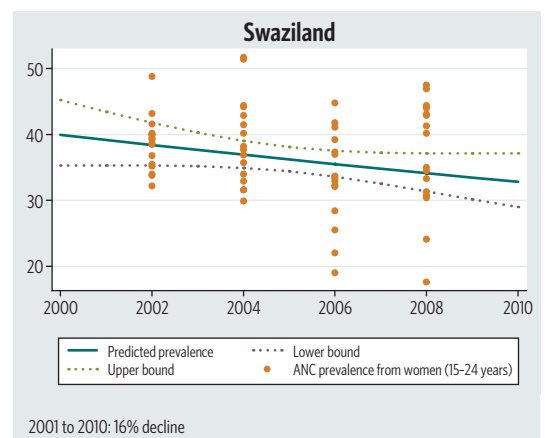
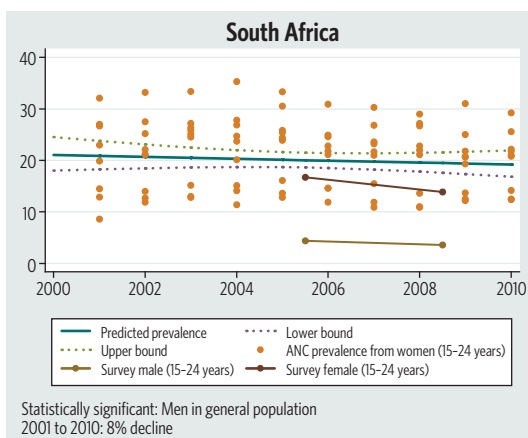
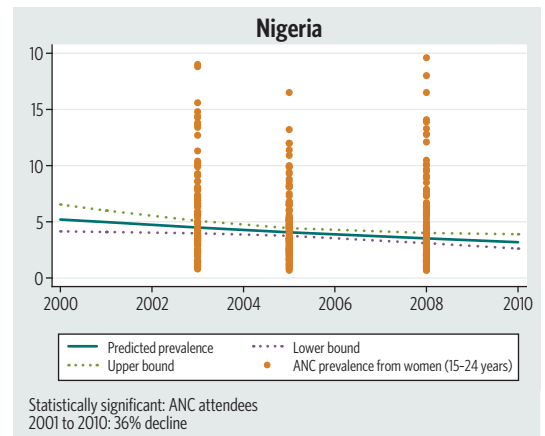
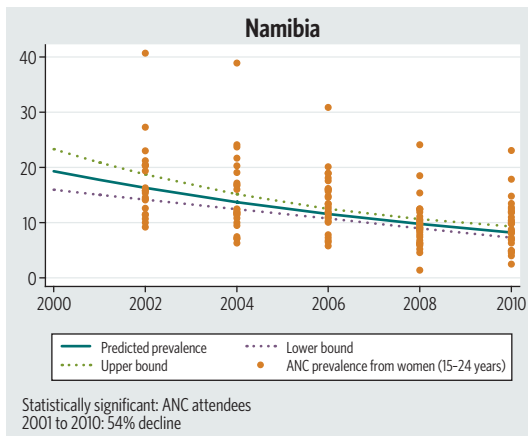
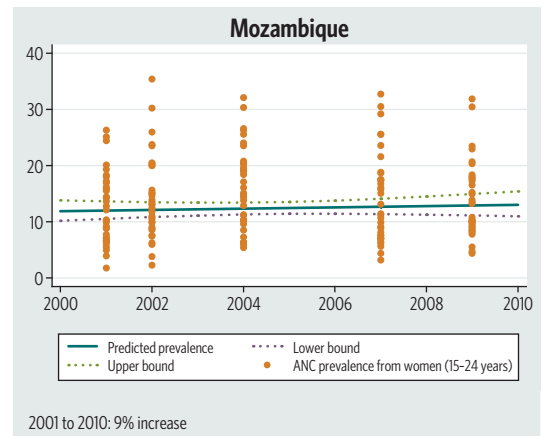
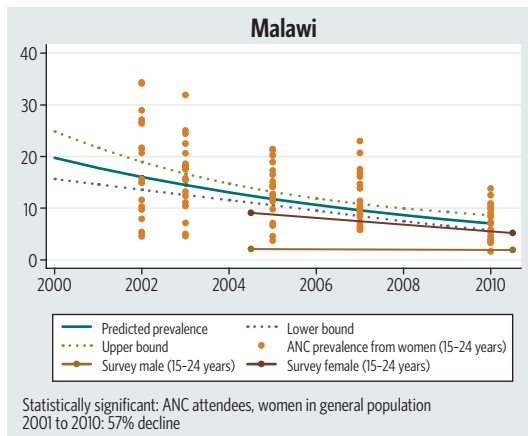
1 Angola, Bahamas, Burkina Faso, Botswana, Democratic Republic of the Congo, Chad, Ethiopia, Gabon, Ghana, Haiti, Kenya, Lesotho, Malawi, Mali, Mozambique, Nigeria, Namibia, South Africa, Swaziland, Togo, Uganda, United Republic of Tanzania, Zambia and Zimbabwe.

2 In the 2001 UNGASS Declaration, countries committed themselves to achieving a 50% decline in HIV prevalence by 2010.

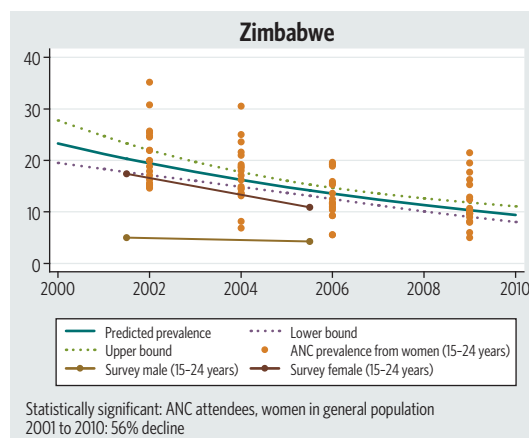
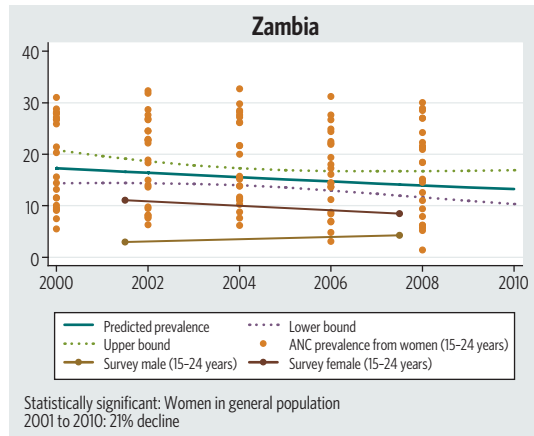
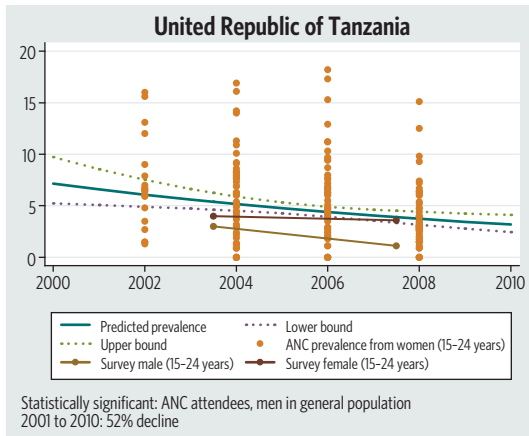
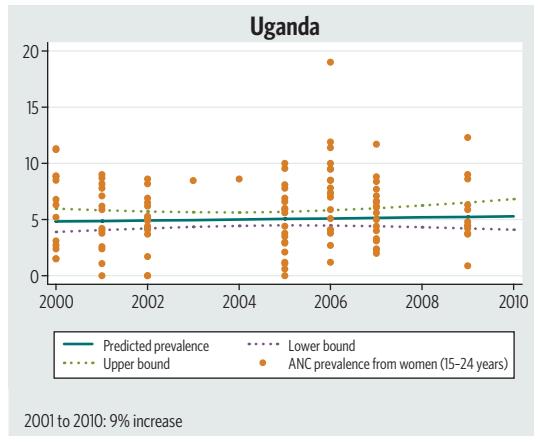
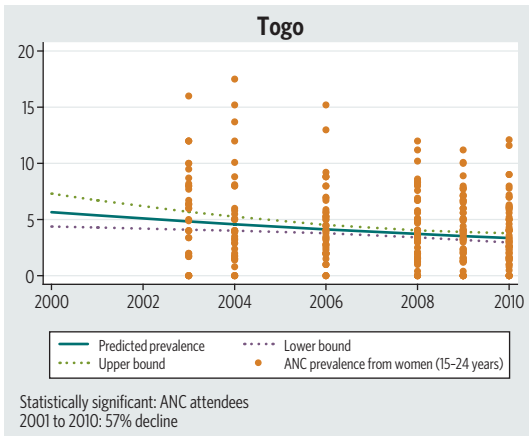
**Fig. 2.5** Prevalence of HIV infection among various population samples in the 24 countries with prevalence exceeding 1% and data available, 2000–2010











The declines in HIV prevalence have occurred amid signs of encouraging changes in sexual behaviour among people 15–24 years old in several countries with generalized epidemics. Survey data from 20 countries in sub-Saharan Africa and the Caribbean provides evidence of these changes (Fig. 2.5).<sup>1</sup>

Analysis shows that the percentage of young men with multiple partners in the 12 months before the most recent survey decreased significantly in 11 of the 19 countries with data available (including in 4 countries with national adult HIV prevalence exceeding 10% in 2009), and among women it decreased in 6 countries (half of them with HIV prevalence exceeding 10%). In Rwanda and Zimbabwe, however, the share of young women with multiple partners appears to have increased, and Guyana and Lesotho have a similar trend among young men.

The proportion of young people who said they used a condom the last time they had high-risk sex increased significantly in 7 (for men) and 5 (for women) of the 17 countries with data available. More than half these countries had a national adult HIV prevalence of at least 10% in 2009. However, condom use during high-risk sex appears to have decreased among young men in Uganda and Zimbabwe and among young women in Mali.

The percentage of young men and women who have had sex before age 15 years decreased significantly in 8 of the 18 countries with data available. In 4 of these

<sup>1</sup> The analysis is based on survey data in countries in which more than one survey was conducted between 2000 and 2010. If more than two surveys were conducted, only the first and last surveys were analysed. On average, the surveys were five years apart. UNGASS indicators were used: the percentage of men and women aged 15–24 years who had sex before age 15 years; the percentage of men and women aged 15–24 years who had more than one partner in the past 12 months; and the percentage of men and women aged 15–24 years who had more than one partner in the past 12 months and who used a condom at last sex.

8 countries, the national adult HIV prevalence exceeded 10% in 2009. In contrast, the proportion of young people who had sex before age 15 years increased among men in Guyana, Lesotho and Rwanda, among women in Lesotho and among both men and women in Haiti.

### 2.1.2 Fewer people are dying from AIDS-related causes ...

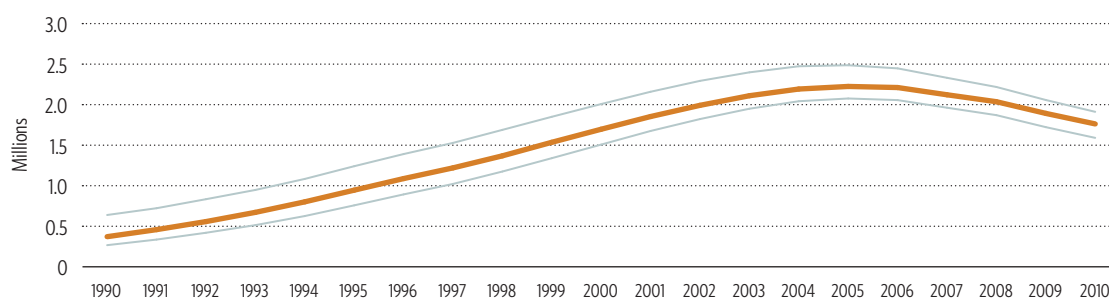
The annual number of people dying from AIDS-related causes worldwide is steadily decreasing from a peak of 2.2 million [2 100 000–2 500 000] in 2005 to an estimated 1.8 million [1 600 000–1 900 000] in 2010 (Fig. 2.6). AIDS-related mortality began to decline in 2005–2006 in sub-Saharan Africa, South and South-East Asia and the Caribbean and has continued subsequently.

Two signal developments have caused this decline: first, the increased availability of antiretroviral therapy, as well as care and support, to people living with HIV, especially in sub-Saharan Africa; and second, fewer people newly infected with HIV since the late 1990s. The effects of antiretroviral therapy are especially evident in sub-Saharan Africa, where an estimated 460 000 (or 30%) fewer people died from AIDS-related causes in 2010 than in 2004, when access to antiretroviral therapy began to be dramatically expanded (Fig. 2.6).

### 2.1.3 ... but the trends vary by region

Not all regions and countries fit the overall trends, however. The annual number of people newly infected with HIV has risen in the Middle East and North Africa from 43 000 [31 000–57 000] in 2001 to 59 000 [40 000–73 000] in 2010. After slowing drastically in the early 2000s, the HIV incidence in Eastern Europe and Central Asia has been accelerating again since 2008.

**Fig. 2.6** Number of people dying from AIDS-related causes globally, 1990–2010



The trends in AIDS-related deaths also differ. For example, in Eastern Europe and Central Asia, the number of people dying from AIDS-related causes increased from 7800 [6000–11 000] in 2001 to 90 000 [74 000–110 000] in 2010. In the same period, AIDS mortality increased by 60% in the Middle East and North Africa (from 22 000 [9700–38 000] to 35 000 [25 000–42 000]) and more than doubled in East Asia (from 24 000 [16 000–45 000] to 56 000 [40 000–76 000]).

In North America and in Western and Central Europe, the number of people dying from AIDS-related causes began to decline soon after antiretroviral therapy was introduced in 1996. The number of deaths attributed to AIDS in Latin America has declined since its peak in 2001–2003 but appears to have levelled off since 2008.<sup>1</sup>

#### **2.1.4 As treatment expands, the number of people living with HIV is rising**

UNAIDS estimates that 34 million [31 600 000–35 200 000] people were living with HIV globally at the end of 2010 versus 28.6 million [26 700 000–30 900 000] in 2001 – a 17% increase (Fig. 2.7). This reflects the high numbers of people newly infected with HIV along with significantly expanded access to antiretroviral therapy, which has helped to reduce the number of people dying from AIDS-related causes, especially since 2004–2005 (Table 2.1).

#### **2.1.5 Half the people living with HIV are women**

Globally, women constituted half (50% [48–53%]) the adults (15 years and older) living with HIV in 2010, according to UNAIDS estimates (Fig. 2.8). That proportion has shifted very little in the past 15 years. The burden of HIV on women, however, varies considerably by region and is heaviest in sub-Saharan Africa. In that region, 1.4 times more adult women than men were living with HIV in 2010. Women comprised 59% [56–63%] of the adults living with HIV in sub-Saharan Africa in 2010, as they have for most of the past decade.

<sup>1</sup> Mexico is now included in the HIV estimates for Latin America. These latest estimates therefore supersede those published in the past by UNAIDS (including estimates for previous years).

The Caribbean is the only other region where women outnumber men among adults living with HIV; they comprised 53% [47–61%] of the adults living with HIV in 2010 (this pattern largely results from the fact that women outnumber men in Haiti, which has the greatest epidemic in the Caribbean). Two regions have experienced slight increases in the proportion of women among people living with HIV in the past decade or more: Latin America (35% [29–41%] in 2010 versus 32% [26–41%] in 2001) and North America and Western and Central Europe (26% [23–33%] in 2010 versus 25% in 2001 [22–28%]). Elsewhere the proportion has hardly shifted, including in Asia (34% [30–37%] to 35% [30–38%]), Eastern Europe and Central Asia (34% [28–40%] to 35% [30–40%]), the Middle East and North Africa (45% [24–57%] to 45% [31–50%]) and Oceania (44% [37–55%] to 44% [39–51%]).

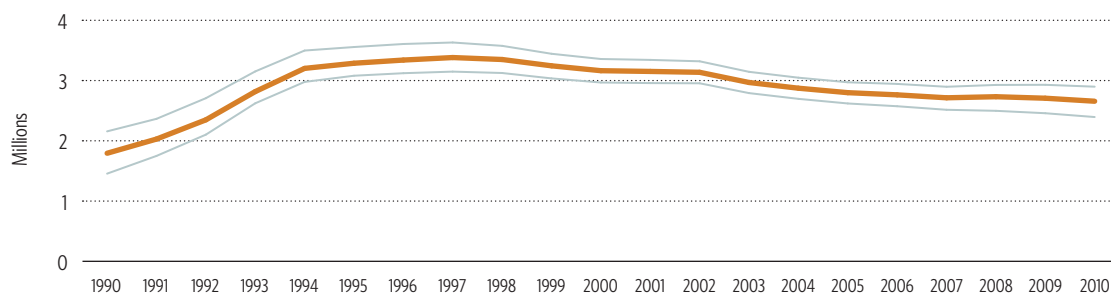
#### **2.1.6 Positive developments among children**

As access to services for preventing the mother-to-child transmission of HIV increased, the annual number of children acquiring HIV infection stabilized in the early 2000s before decreasing steeply in the past few years (Fig. 2.9). An estimated 390 000 [340 000–450 000] children were newly infected with HIV in 2010, 30% fewer than the peak of 560 000 [500 000–630 000] children newly infected annually in 2002 and 2003. The number of children (younger than 15 years) living with HIV globally has levelled off in the past few years and totaled 3.4 million [3 000 000–3 800 000] in 2010; more than 90% were living in sub-Saharan Africa.<sup>2</sup>

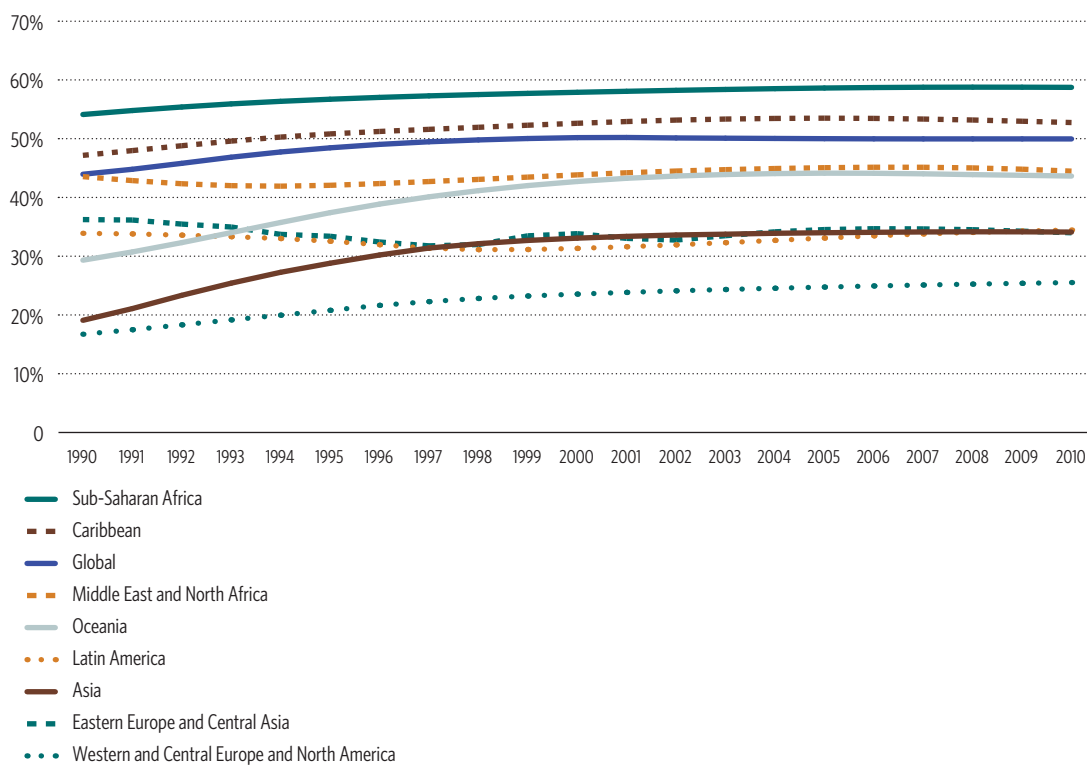
Deaths among children younger than 15 years are declining. The estimated 250 000 [220 000–290 000] children who died from AIDS-related illnesses in 2010 were 20% fewer than the estimated 320 000 [280 000–360 000] who died in 2005. This trend reflects the steady expansion of services to prevent HIV from being transmitted to infants and, to a lesser degree, the slow expansion of access to treatment for children.

<sup>2</sup> This is higher than previous estimates because of improvements made to the estimation models, including improved assumptions about the survival of children living with HIV and the effects on their survival of the timing of their infection (see Box 2.4).

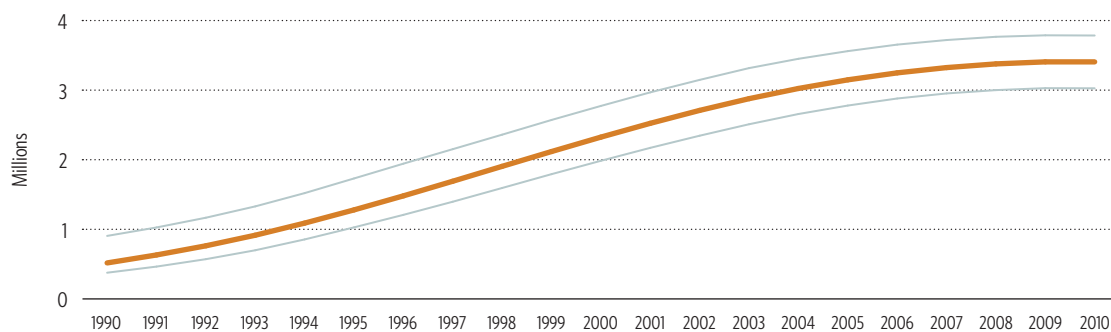
**Fig. 2.7** Number of people newly infected with HIV globally, 1990-2010



**Fig. 2.8** Percentage of adults (15+ years) living with HIV who are female, by geographical region, 1990-2010



**Fig. 2.9** Number of children 0-14 years old living with HIV globally, 1990-2010



### Box 2.1

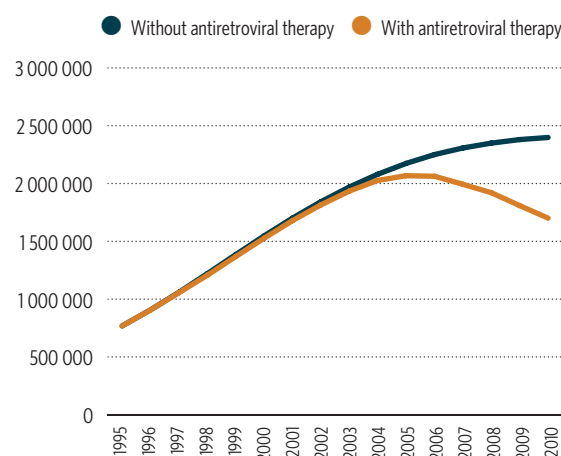
#### Antiretroviral therapy has averted 2.5 million deaths in low- and middle-income countries

Introducing antiretroviral therapy has averted 2.5 million deaths in low- and middle-income countries globally since 1995, according to new calculations by UNAIDS<sup>1</sup>. Sub-Saharan Africa accounts for the vast majority – about 1.8 million – of the averted deaths, 300 000 each for Asia and the Pacific and Latin America, 41 000 for Eastern Europe and Central Asia, 26 000 for the Caribbean and 6000 for the Middle East and North Africa.

The number of deaths averted has doubled in the past two years. In 2010 alone, antiretroviral therapy averted an estimated 700 000 deaths in low- and middle-income countries. Nevertheless, only 100 000 (4%) of the 2.5 million averted deaths have been among children younger than 15 years.

The 2.5 million total is lower than previous estimates, which included high-income countries in Western Europe and North America, with high impact of antiretroviral therapy.

**Fig. 2.10** Total number of people dying from AIDS-related causes in low- and middle-income countries, 1995–2010



<sup>1</sup> To gauge the effect of antiretroviral therapy on AIDS-related mortality rates, two scenarios were created using Spectrum 2010 country files. In one scenario, the number of adults and children receiving antiretroviral therapy in low- and middle-income countries was reduced to zero. The second scenario reflects UNAIDS' best current estimate of the number of people dying from AIDS-related causes from 1995 to 2010. The difference in the numbers of deaths in the two scenarios constitutes an estimate of the number of deaths averted by antiretroviral therapy.

### Box 2.2

#### More than 350 000 children avoided acquiring HIV infection because of antiretroviral prophylaxis

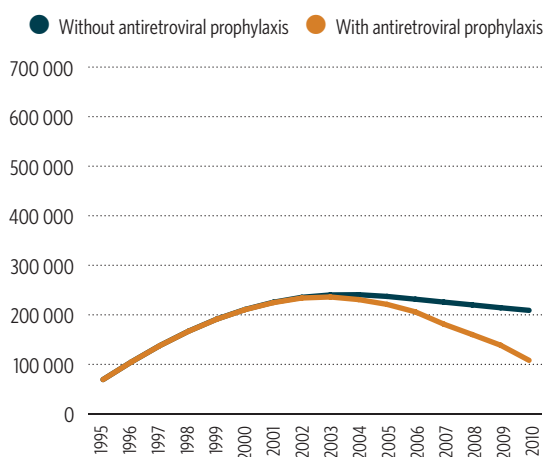
UNAIDS recently calculated that more than 350 000 children have avoided becoming newly infected with HIV since 1995 because of the antiretroviral prophylaxis provided to pregnant women living with HIV (Fig. 2.11).<sup>1</sup>

Eighty-six per cent of the children who avoided HIV infection live in sub-Saharan Africa, the region with the highest HIV prevalence among women of reproductive age. Eastern Europe and Central Asia has the second highest number of children who avoided acquiring HIV infection (virtually all women in these countries are tested for HIV during antenatal care) at 23 000. In the remaining regions, the numbers of children avoiding HIV infection were 14 000 in Asia and the Pacific, 9000 in Latin America, 3000 in the Caribbean and less than 1000 in the Middle East and North Africa.

The cumulative number of children who avoided infection from programmes to prevent mother-to-child transmission doubled between 2008 and 2010, as coverage of these services grew dramatically.

The analysis only considers the children who avoided infection because of antiretroviral prophylaxis and does not include children who avoided infection because of other services to prevent the mother-to-child transmission of HIV (such as counselling on infant feeding, reducing unwanted pregnancies among women living with HIV or reducing the number of women of reproductive age who become newly infected with HIV).

**Fig. 2.11** Number of new HIV infections among children in low- and middle-income countries 1995–2010



<sup>1</sup> These calculations are based on two scenarios that were created using Spectrum 2010 country files. In one scenario, no pregnant women received antiretroviral prophylaxis to prevent the mother-to-child transmission of HIV. The second scenario describes the UNAIDS estimate of the number of children newly infected with HIV since 1995 within the context of existing coverage levels of programmes to prevent mother-to-child transmission. The difference between the numbers of children newly infected with HIV in each of the two scenarios constitutes an estimate of the number of children who avoided acquiring infection because of antiretroviral prophylaxis.

### Box 2.3

#### Using strategic information to optimize the allocation of resources

During the past few years, several countries in eastern and southern Africa (1), western and central Africa (2), Asia (3,4) and Latin America (4) have analysed the distribution of the people newly infected with HIV according to the mode of transmission. In Morocco, this type of analysis has been combined with information on recent spending patterns to focus future prevention planning.

In Morocco in 2009, estimates of HIV incidence were calculated for different key affected populations, using the modes of transmission model (5). The calculations were based on a review of the available epidemiological, biological, behavioural and contextual HIV data for Morocco.

The modes of transmission analysis indicated that the main factors in the HIV epidemic in Morocco are unprotected paid sex, sex between men and the sharing of contaminated drug-injecting equipment. Together this higher-risk behaviour accounts about two thirds of the total number of people acquiring HIV infection and should therefore be given priority for HIV programming. In more detail, the analysis showed the following.

- HIV infection acquired in paid sex networks contributed an estimated 43% [26–64%] of the number of people newly infected with HIV in 2009. HIV transmission among female sex workers occurs across most of the country but is most intense in the south (especially in Agadir), where the prevalence of HIV infection exceeds 5%.
- Together, networks of men who have sex with men and people who inject drugs are estimated to have contributed just over 20% of the people newly infected with HIV in 2009. The analysis indicated the potential for a substantial HIV epidemic among people who inject drugs. Data about risk behaviour among men who have sex with men were limited but will be improved in 2011 using the results from an integrated biological and behavioural surveillance survey.
- Although the HIV incidence in the general heterosexual population is low, the actual number of people acquiring HIV infection in this population group is considerable because this group comprises most of the sexually active population.

The comparison showed that HIV prevention spending in 2008 did not match the distribution of people newly infected with HIV in Morocco. As a result, the resource needs for future prevention interventions were revised. The 2012–2016 National Strategic Plan for Morocco now proposes to allocate 63% of AIDS resources towards prevention among key populations at higher risk – including 13% for people who inject drugs, 13% for men who have sex with men and 23% for sex workers and their clients.

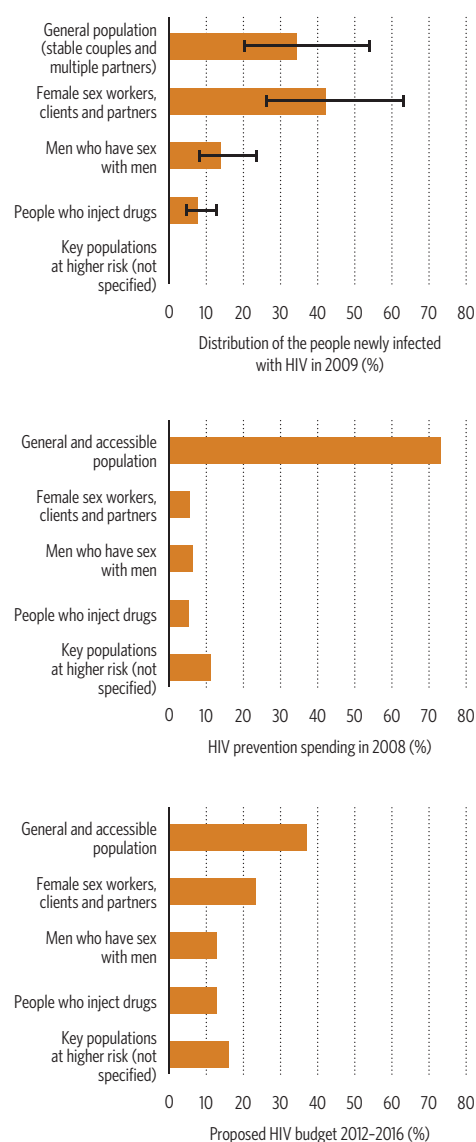
The mode of transmission modelling, however, is limited by several factors.

There are gaps in the available scientific evidence on which it draws. More representative multicentre integrated biobehavioural surveillance that reaches hidden and hard-to-reach key populations at higher risk would further strengthen iterations of this type of analysis, as would mapping and more scientific estimations of the numbers of people who inject drugs, men who have sex with men and female sex workers and their clients. Morocco is planning several integrated biobehavioural surveillance surveys among key populations at higher risk in the next two years.

The model does not incorporate overlapping risk factors; it calculates the number of people newly infected with HIV only over the short term of one year, and it is generally applied at the national level rather than at the local or regional level.

Nevertheless, the comparison of the distribution of the people newly infected against current programme spending has helped Morocco recognize the mismatch in resource allocation and has led to new priority-setting for future programming.

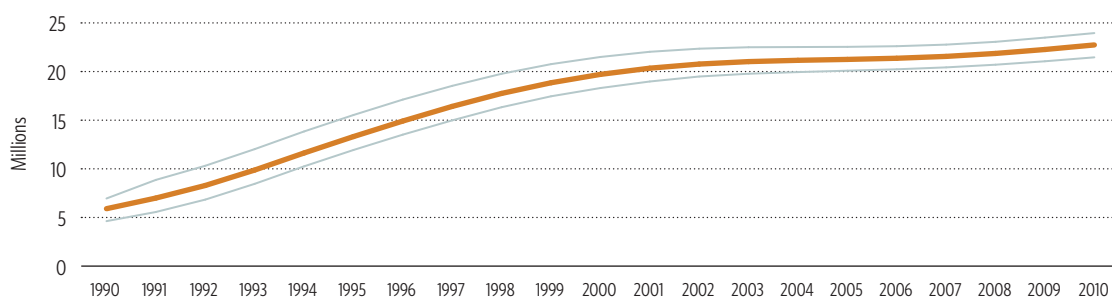
**Fig. 2.12 Morocco: number of people newly infected with HIV (by mode of transmission) in 2009 compared with the percentage distribution of HIV prevention spending in 2008 and the proposed percentage distribution of HIV prevention budgets for 2012–2016**



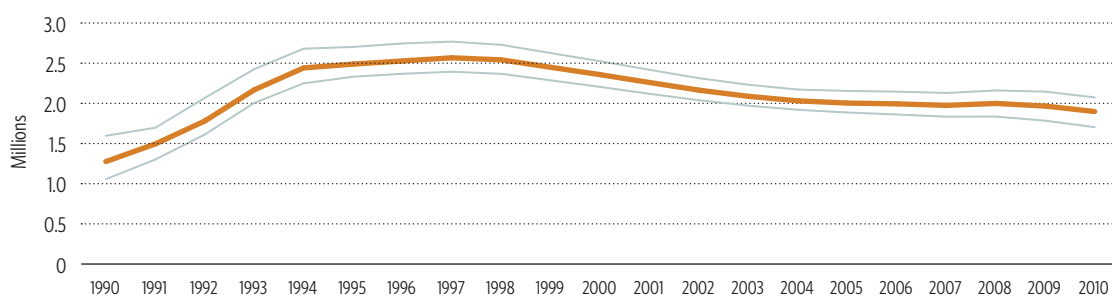
## 2.2 Sub-Saharan Africa

### 2.2.1 Sub-Saharan Africa remains disproportionately affected ...

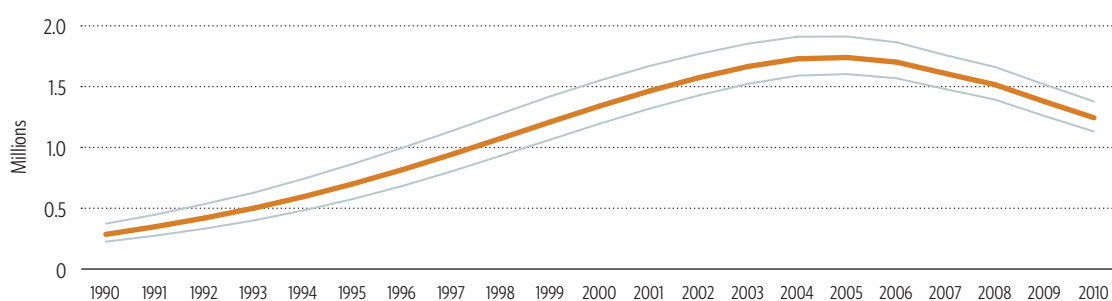
**Fig. 2.13** Number of people living with HIV, sub-Saharan Africa, 1990–2010



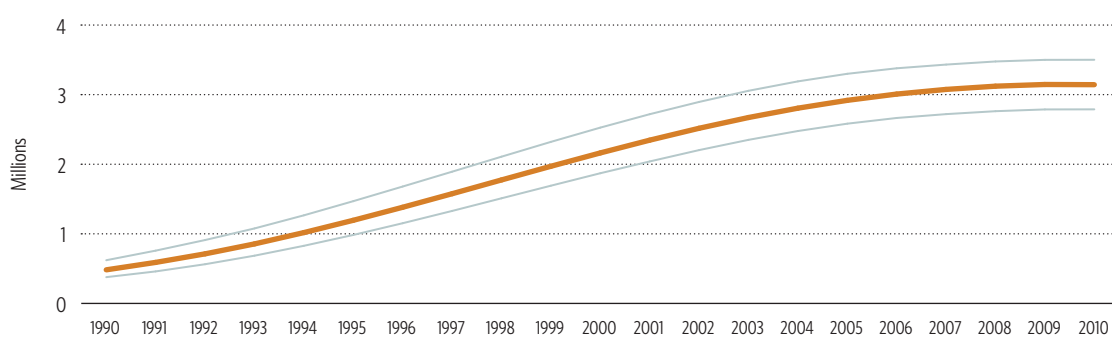
**Fig. 2.14** Number of people newly infected with HIV, sub-Saharan Africa, 1990–2010



**Fig. 2.15** Number of people dying from AIDS-related causes, sub-Saharan Africa, 1990–2010



**Fig. 2.16** Number of children 0–14 years old living with HIV, sub-Saharan Africa, 1990–2010



Sub-Saharan Africa continues to bear a disproportionate share of the global HIV burden. In mid-2010, about 68% of all people living with HIV resided in sub-Saharan Africa, a region with only 12% of the global population (Fig. 2.13–2.16).

The 1.9 million [1 700 000–2 100 000] people who became newly infected with HIV in 2010 in sub-Saharan Africa represented 70% of all the people who acquired HIV infection globally. However, the number of people newly infected in this region is decreasing. About 16% fewer people acquired HIV infection in 2010 than in 2001 (when an estimated 2.2 million [2 100 000–2 400 000] people were newly infected).

Because people accessing antiretroviral therapy and care tend to survive longer, the total number of people living with HIV in sub-Saharan Africa is increasing; it reached 22.9 million [21 600 000–24 100 000] in 2010 (12% more than in 2001).

More women than men in sub-Saharan Africa are living with HIV; in 2010, women comprised 59% [56–63%] of the people living with HIV in that region (very close to the same proportion as a decade ago).

The epidemics in sub-Saharan Africa vary considerably, however, with southern Africa most severely affected (Table 2.1). An estimated 11.1 million [10 600 000–11 600 000] people were living with HIV in southern Africa in 2009, 31% more than the 8.6 million [8 100 000–9 100 000] people living with HIV in the region a decade earlier.

### **2.2.2 ... but the incidence of HIV infection is declining in almost half the countries**

Modelling indicates that the incidence of HIV infection (the number of people newly infected with HIV) peaked in the mid-1990s in sub-Saharan Africa, and evidence indicates that the incidence is declining in almost half the countries in the region.

In 22 countries, national models of HIV prevalence showed that the incidence of HIV infection declined by more than 25% between 2001 and 2009 – including in some of the countries with the largest epidemics in the region: Ethiopia, Nigeria, Zambia and Zimbabwe.

Zimbabwe is the first country in southern Africa to record a significant, sustained decline in the national prevalence of HIV infection among adults, which fell

from 29% in 1997 to 16% in 2007 (6). In the capital, Harare, for example, the annual HIV incidence is estimated to have peaked in 1991 (at 5.5%) and slowed to 1% in 2010 (7). These trends reflect the natural evolution of the HIV epidemic along with changes in sexual behaviour (6). Increased awareness of AIDS deaths and the country's economic decay appeared to have been the primary factors driving these changes in behaviour (8).

South Africa's HIV epidemic remains the largest in the world, with an estimated 5.6 million [5 400 000–5 800 000] people living with HIV in 2009 (9).<sup>1</sup> This figure equals the total number of people living with HIV in all of Asia. The annual HIV incidence in South Africa was still a high 1.5% [1.3–1.8%] in 2009, down from 2.4% [2.1–2.6%] in 2001, although it varied considerably – from 0.5% in Western Cape province to 2.3% in KwaZulu-Natal, the most severely affected province in the country (9). These trends have occurred alongside apparent shifts to safer sex among young people (mainly increased condom use) (10).

The epidemics in Botswana, Namibia and Zambia (where the HIV incidence declined, especially among women, between 2004 and 2008 (11)) also appear to be declining, while those in Lesotho, Mozambique and Swaziland seem to be levelling off. However, in all these countries, the proportion of the population living with HIV remains exceedingly high. Angola's comparatively younger epidemic still appears to be growing.

### **2.2.3 The epidemics vary between the subregions**

The southern Africa subregion continues to experience the most severe HIV epidemics in the world. One third (34%) of all people living with HIV globally in 2009 resided in the 10 countries in southern Africa,<sup>2</sup> as did about 40% of all women living with HIV. Fully 31% of the people newly infected with HIV and 34% of all the people dying from AIDS-related causes in the same year lived in these 10 countries.

The epidemics in eastern Africa began declining about a decade ago and have since stabilized in many countries. The HIV incidence slowed in the United Republic of Tanzania to about 3.4 per 1000 person-years between

<sup>1</sup> UNAIDS publishes HIV estimates for individual countries every two years; the most recent set of estimates (for 2009) was published in 2010.

<sup>2</sup> Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe.



2004 and 2008 (11). The national HIV prevalence in Kenya fell from about 14% in the mid-1990s to 6% in 2006 (12) and has stayed there since 2006, while in Uganda it has been stable at between 6% and 7% since 2001, and in Rwanda it stayed at about 3% between 2005 and 2009.

Much smaller proportions of the population are living with HIV in western and central Africa, where the adult HIV prevalence was estimated to be 2% or less in 12 countries in 2009 (Benin, Burkina Faso, Democratic Republic of the Congo, Gambia, Ghana, Guinea, Liberia, Mali, Mauritania, Niger, Senegal and Sierra Leone). The national HIV prevalence in 2009 was highest in Cameroon at 5.3% [4.9–5.8%], Central African Republic 4.7% [4.2–5.2%], Côte d'Ivoire 3.4% [3.1–3.9%], Gabon 5.2% [4.2–6.2%] and Nigeria 3.6% [3.3–4.0%]. Nigeria continues to have the second largest number of people living with HIV in sub-Saharan Africa.

#### **2.2.4 Fewer children acquire HIV infection and die from AIDS**

There has been strong progress in reducing the HIV incidence among children younger than 15 years in sub-Saharan Africa. The estimated 350 000 [300 000–410 000] children who were newly infected with HIV in 2010 in sub-Saharan Africa were 30% fewer than the 500 000 [450 000–570 000] who acquired HIV infection in 2001. Fewer children are dying from AIDS-related causes, from an estimated 320 000 [280 000–360 000] in 2005 to 230 000 [200 000–260 000] in 2010.

South Africa is one of the few countries in the world in which child and maternal mortality increased in the 2000s, a trend that largely resulted from AIDS (13). However, the country's national programme for preventing mother-to-child transmission of HIV is showing highly encouraging results and could help reverse that child mortality trend. New data show that, after nine years of implementing the programme, the transmission rate at 4–8 weeks (early transmission which excludes transmission caused by breastfeeding) was less than 4% (ranging from 2.3% to 6.2%, depending on the province) (14). Based on a set of assumptions on breastfeeding duration and related transmission probabilities<sup>1</sup>, adding the postnatal transmission from breastfeeding (late transmission)

<sup>1</sup> Assuming median duration of breastfeeding among women living with HIV is 12 months and transmission is 1.57 per month among those with CD4 counts less than 350 and 0.51 per month among women with CD4 counts more than 350.

results in an estimated final overall mother to child transmission rate between 12% and 18%.

#### **2.2.5 Fewer people are dying from AIDS-related causes**

AIDS has claimed at least 1 million lives annually in sub-Saharan Africa since 1998, with that death toll having peaked at 1.7 million [1 600 000–1 900 000] in 2005. Since then, however, the number of people dying from AIDS-related causes has steadily decreased, as antiretroviral therapy free of charge became more widely available in the region. The estimated 1.2 million [1 100 000–1 400 000] people dying from AIDS-related illnesses in 2010 were 29% fewer than in 2005. Almost half the deaths occurred in southern Africa.

Local studies are confirming that expanded access to antiretroviral therapy is reducing AIDS mortality rates in sub-Saharan Africa.

A recent study based on mortality records from the cities of Bulawayo and Harare in Zimbabwe has shown a 19% decline in crude mortality rates after antiretroviral therapy access expanded (15). In a rural district in Malawi, where antiretroviral therapy became available free of charge in 2005, the death rate among adults declined by 10% and AIDS-related mortality fell by 19% between 2002 and 2006 (16). Among women participating in an infant-feeding trial in Lusaka, Zambia, mortality more than halved after treatment became available in 2004–2005 (17). A similar decrease was observed in the capital of Ethiopia, Addis Ababa, where the number of people dying from AIDS-related causes declined by more than half five years into the antiretroviral therapy programme. The decline in AIDS-related deaths was steepest after antiretroviral therapy became available free of charge and fell 38% for men and 43% for women between 2005 and 2007 (18). In a rural district in South Africa's KwaZulu-Natal province, overall population mortality and AIDS-related mortality declined significantly after antiretroviral therapy was provided in the community. Between 2002–2003 (before treatment was available) and 2004–2006 (after it was introduced), AIDS-related mortality decreased from 26.5 to 18.7 per 1000 person-years for men aged 25–49 years and from 22.5 to 17.6 per 1000 person-years for women in the same age group.

Such has been the intensity of the AIDS epidemic, however, that it has dramatically increased the risk of dying in many sub-Saharan African countries, especially in southern Africa. Since 1990, the estimated probability of people dying between the ages of 15 and 60 years has risen considerably in that subregion: in 2010, it exceeded 600 per 1000 for men in Botswana, Lesotho, Malawi, Mozambique, Namibia, Swaziland, Zambia and Zimbabwe and was at least 500 for women in Lesotho, Malawi, Namibia, Swaziland, Zambia and Zimbabwe (19).

### **2.2.6 HIV transmission in long-standing relationships and concurrent partnerships ...**

The vast majority of people newly infected with HIV in sub-Saharan Africa acquire the virus during unprotected heterosexual intercourse (including paid sex) or as newborns and breastfed babies (via mother-to-child transmission). Having unprotected sex with multiple partners and having other sexually transmitted infections (especially genital ulcers caused by herpes simplex virus type 2) are the greatest risk factors for HIV infection in this region.

Overlapping sexual networks can drastically speed up the rate of HIV transmission and boost the scale of HIV epidemics such as those in sub-Saharan Africa (20–22). Nevertheless, the empirical evidence supporting the importance of concurrency remains weak (23,24). Recent studies have found a very strong relationship between people having had more than one sexual partner and living with HIV but found no association between concurrency in men and HIV incidence in women (24) or between concurrency and HIV prevalence among men (25).

Meanwhile, increasing evidence shows that, as mainly heterosexual epidemics evolve, increasing proportions of the people who are newly infected with HIV are in HIV-discordant cohabiting couples (in which only one person is living with HIV) (26,27), and HIV transmission within long-term relationships is increasing (28).

Many of these serodiscordant couples are unaware of one another's HIV status. In Kenya, Malawi and Uganda, more than 80% of all unprotected sex acts involving people living with HIV are estimated to occur with spouses or cohabiting partners (29,30). Consequently, large proportions of the people newly infected with HIV are within married or cohabiting heterosexual couples.

Moreover, it was assumed that, in such serodiscordant couples, the partner living with HIV is most likely to be male. But a recent review of Demographic and Health Survey data from 14 countries in sub-Saharan Africa found that women were as likely to be the index partner: the proportion of women living with HIV in stable serodiscordant couples was 47% (31). Additional research suggests that large proportions of cases in which the woman is the partner living with HIV are widowed or divorced women remarrying (32).

Prevention strategies need to be tailored to these trends and patterns of HIV transmission, with behavioural change programmes that aim to reduce the number of partners and expanded HIV testing and counselling for couples, especially for preventing mother-to-child transmission. Among serodiscordant couples in northern Malawi, for example, HIV transmission was drastically reduced after the person living with HIV discovered his or her serostatus and began antiretroviral therapy; in those couples, zero HIV transmission occurred during a three-year follow-up period (33).

### **2.2.7 ... and unprotected paid sex and sex between men remain significant factors**

Continuing evidence indicates that unprotected paid sex and sex between men are significant factors in the HIV epidemics in several sub-Saharan African countries.

It has been postulated that unprotected paid sex was a more significant factor in early HIV epidemics in sub-Saharan Africa. However, a review of 68 studies from 18 countries suggests that paid sex can remain an equally important factor in mature epidemics (34).

An estimated 14% of the people acquiring HIV infection in Kenya are linked to sex work (HIV infection among sex workers, their clients or their other sex partners) (35). An earlier study concluded that about four fifths of prevalent cases of HIV among adult men in Accra, Ghana, might have been acquired during unprotected paid sex (36). Female sex workers continue to have very high HIV incidence and prevalence in several other countries: 12% annual HIV incidence in north-central Nigeria (37) and 30% prevalence in Dar es Salaam, United Republic of Tanzania (38), for example. This indicates that condoms are not being routinely used routinely in sex work.

The results from recent studies indicate that cities in sub-Saharan Africa have many men who have sex

with men and high rates of HIV infection among those surveyed (39). Fully half (50%) of men who have sex with men who participated in a 2008 study in Johannesburg, South Africa, were living with HIV, as were 28% of those in surveyed in the port city of Durban (40). In Unguja, Zanzibar, United Republic of Tanzania, the HIV prevalence among men who have sex with men was 12% (41), 17% in Lagos and 9% in Kano (Nigeria) in a 2007 study (42), 14% in a 2008–2009 study in Kampala (Uganda) (43), and an average 17% in Botswana, Malawi and Namibia (44). In most of these instances, the HIV prevalence among men who have sex with men was even higher than in the general population.

In sub-Saharan Africa, as in other regions where sex between men is highly stigmatized, large proportions of men who have sex with men also have sex with women. In Senegal, 82% of surveyed men who have sex with men said that they also had sex with women (45), while 50% of those participating in the Lagos study cited above said they had sex with girlfriends

(46) and one third of those surveyed in Malawi were married or cohabiting with a woman. Enforcement of criminal penalties on sex between men compromises the health of men who have sex with men and their various partners by limiting access to essential HIV and other essential public health services (47).

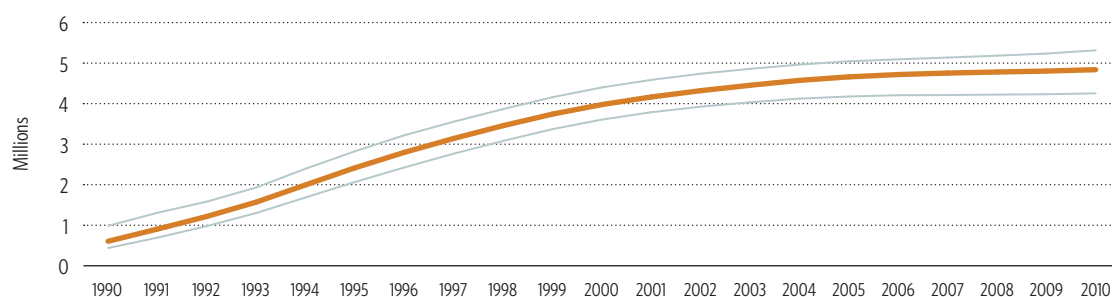
### **2.2.8 Injecting drug use is a growing problem in some countries**

Injecting drug use is a relatively recently reported phenomenon in sub-Saharan Africa. It is the main risk factor for HIV infection only in Mauritius (48), where 47% of people who inject drugs tested HIV-positive in a recent study (49). However, studies elsewhere have also revealed high HIV prevalence among people who inject drugs: 42% among those tested in Dar es Salaam (United Republic of Tanzania) (50), 16% in Unguja, Zanzibar (51) (United Republic of Tanzania) and 36% in Nairobi (Kenya) (52). In the latter instances, however, injecting drug use remains a minor factor in these countries' HIV epidemics, since few people inject drugs.

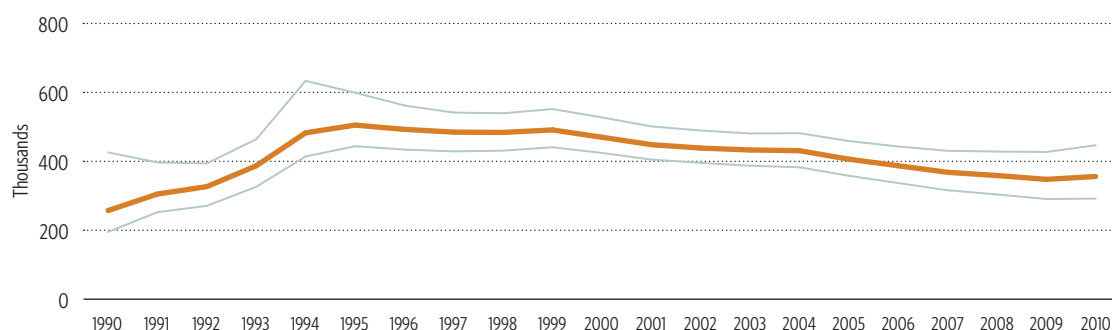
## 2.3 Asia

### 2.3.1 There are signs that the epidemic is slowing down ...

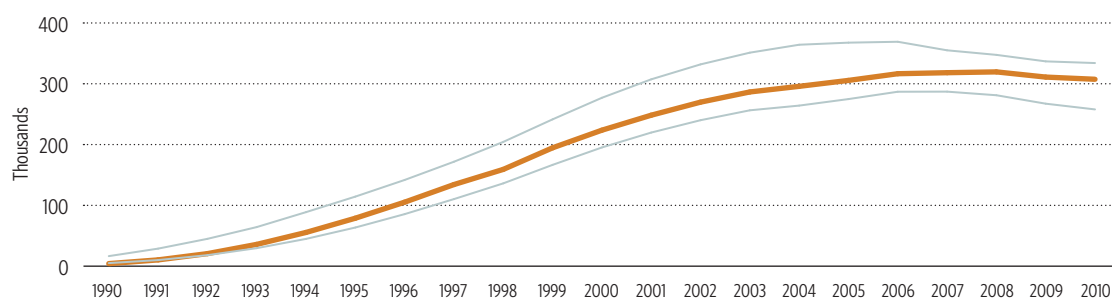
**Fig. 2.17** Number of people living with HIV, Asia, 1990-2010



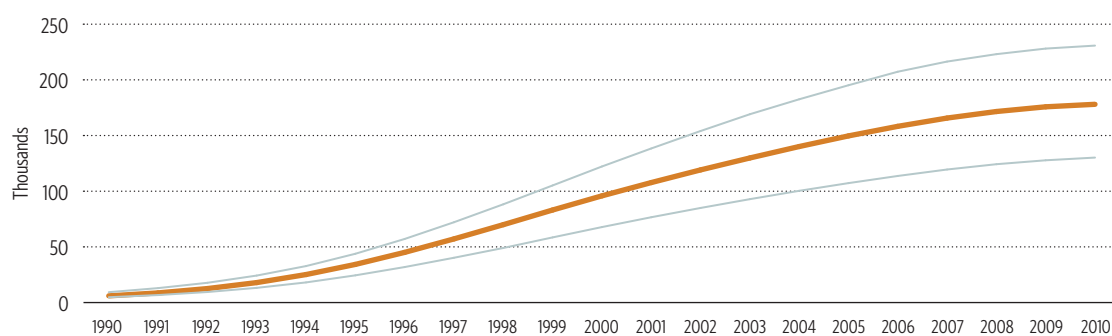
**Fig. 2.18** Number of people newly infected with HIV, Asia, 1990-2010



**Fig. 2.18** Number of people dying from AIDS-related causes, Asia, 1990-2010



**Fig. 2.20** Number of children 0-14 years old living with HIV, Asia, 1990-2010



In Asia, the rate of HIV transmission appears to be slowing down: the estimated 360 000 [300 000–450 000] people who were newly infected with HIV in Asia in 2010 were considerably fewer than the 450 000 [410 000–500 000] estimated for 2001.

The incidence of HIV infection in the older epidemics in South and South-East Asia appears to have peaked in the mid-1990s (at 440 000–465 000 people newly infected annually) and decreased markedly since then to about 270 000 [230 000–340 000] people acquiring HIV infection in 2010. In East Asia, however, the HIV incidence did not reach its highest levels until the mid-2000s (about 94 000 people newly infected annually in 2004–2005) but decreased subsequently to about 88 000 [48 000–160 000] in 2010.

About 4.8 million [4 300 000–5 300 000] people were living with HIV in Asia in 2010, 11% more than the 4.2 million [3 800 000–4 600 000] in 2001 (Table 2.1, Fig. 2.17–2.20). HIV transmission rates have slowed in the larger epidemics, but expanded access to antiretroviral therapy has increased the survival rates of people living with HIV. An estimated 310 000 [260 000–340 000] people died from AIDS-related causes in 2010 – the largest death toll outside sub-Saharan Africa. That death toll has stayed relatively stable during the past decade in Asia overall, but in East Asia it doubled from 24 000 [16 000–45 000] in 2001 to 56 000 [40 000–76 000] in 2010.

Seven countries report an estimated 100 000 or more people living with HIV in 2009: India, China, Thailand (the only country in this region in which the prevalence is close to 1%), Indonesia, Viet Nam, Myanmar and Malaysia (ranked by the number of people living with HIV in each). More than 90% of the people with HIV in Asia live in these countries, with India alone accounting for 49% of the people living with HIV in the entire region.

The proportion of women living with HIV has stabilized at about 35% [30–38%]. Many of these women acquired HIV during unprotected sex with their regular male partners.

The estimated number of children younger than 15 years living with HIV increased from 110 000 [75 000–140 000] in 2001 to 180 000 [130 000–230 000] in 2010. The annual number of children dying from AIDS-related causes has ranged between 15 000 [9400–21 000] (in 2010) and 17 000 [12 000–

24 000] (in 2004) for the past decade but appears to be decreasing slowly.

The number of children newly infected with HIV declined by 23% in Asia overall between 2001 and 2010, from an estimated 28 000 [19 000–39 000] to 22 000 [16 000–30 000]. This probably reflects the slowing rate of HIV incidence in this region overall as well as the (uneven) expansion of services to prevent mother-to-child transmission of HIV. However, an opposite trend is evident in East Asia, where the incidence of HIV infection among children rose by 31% (from 1600 [1100–2200] to 2200 [1100–3600] people newly infected) in that same period.

The overall trends in this region hide important variation in the epidemics, both between and within countries. In many Asian countries, national epidemics are concentrated in relatively few provinces. In China, for example, five provinces account for just over half (53%) the people living with HIV (53), and much of Indonesia's burden of HIV is in its Papua and West Papua provinces (54).

Various combinations of injecting drug use, unprotected sex between men and unprotected paid sex fuel the epidemics in this region, with paid sex especially prominent in the more mature epidemics.

Most epidemics in Asia follow a similar path, although the intensity and pace of the progress of the epidemics vary greatly, depending on the levels of drug injecting and sexual risk-taking in a country.

In most countries in this region, outbreaks of HIV were first detected among men who have sex with men or people who inject drugs. However, the links between injecting drug use and sex work (both people who inject drugs and who also buy sex, and sex workers who also inject drugs) eventually generate a more extensive epidemic among sex workers and their clients. Since large numbers of men buy sex, sex work becomes a major component of overall national epidemics in most countries. The male clients then transmit HIV more slowly but steadily to their wives and girlfriends. In recent years, an existing lower-intensity epidemic among men who have sex with men has surged throughout the region. Mobility, social changes and other factors (including Internet dating and soft drug use) appear to be providing further opportunities for HIV to spread extensively among men who have sex with men.

### 2.3.2 ... but HIV infection trends among sex workers vary ...

Infection levels reported in various surveys conducted among female sex workers vary considerably: in China, from well under 1% in Nanning (55) and Shanghai (56) to 10% in Kaiyuan City (57) in 2008-2009; in India, from 4.6% in Mumbai and Thane (58) to 24% among street-based sex workers and 29% among their brothel-based counterparts in some districts in Maharashtra in 2009 (59).

Although still low (under 1%), the percentages of female sex workers living with HIV have increased in Afghanistan (60), Indonesia and Pakistan (61), as HIV transmission in these countries expands among and beyond people who inject drugs. Many people who inject drugs also buy or sell sex, thus compounding the risk of HIV transmission. In some locations, such as Cebu (Philippines), Ho Chi Minh City (Viet Nam) and parts of southern China, the prevalence among sex workers who inject drugs is much higher than among sex workers who do not inject drugs. In a review of studies in China, for example, 12-49% of female sex workers who also inject drugs were living with HIV, depending on the place (62).

But there is also increasing evidence that intensive HIV prevention programmes among female sex workers can be highly effective. A prevention programme in Karnataka (India) was associated with a drop in HIV prevalence from 25% to 13% among female sex workers in three selected districts between 2004 and 2009 (63) and from 1.4% to 0.8% among young antenatal clinic attendees between 2004 and 2008 in 18 districts (64). In Mumbai and Thane, a similar programme was accompanied by a decline in HIV prevalence from 45% in 2004 to 13% in 2010 among brothel-based sex workers (58).

Clients of sex workers make up the largest key population at higher risk in Asia: depending on the country, between 0.5% and 15% of adult men in the region are believed to buy sex (65-70). Recent studies are revealing the extent to which clients are infected with HIV: the HIV prevalence in three cities in China's Sichuan province was 1.5% in 2008 (71) and 5.6% among their peers in six districts in India's Karnataka state in 2010 (72). In a study among men frequenting bars, beer gardens and massage parlours (places where sex is commonly sold) in eight cities in Cambodia, the HIV prevalence among the men who said they

had sexual partners other than their spouses or girlfriends was 1.6% (three times the national adult HIV prevalence) (73).

### 2.3.3 ... large proportions of people who inject drugs are becoming infected ...

The prevalence among people who inject drugs is still very high in several countries and is increasing in others.

An estimated 4.5 million people in Asia inject drugs; more than half live in China (74).

Overall, an estimated one in six people who inject drugs (16%) in Asia is living with HIV (74), but the HIV prevalence is much higher in some places.

In recent local studies, between 11% and 24% of people who inject drugs in Thailand (75) tested HIV-positive, as did between 23% and 58% of those in various provinces in Viet Nam (76-78), more than 50% in parts of Indonesia (54) and 23% in Rawalpindi and 52% in Mandi Bahauddin, cities in Punjab (Pakistan) (79). (In earlier sentinel surveillance studies in Thailand, the HIV prevalence ranged between 30% and 50% among people who inject drugs (80).) The prevalence of HIV infection among people who use drugs varies widely in China - from less than 1% in the cities of Haikou, Hangzhou, Qingdao and Shanghai, to 2.6% in Beijing, 7.5% in Chongqing and 16% in Kunming (81).

Most countries in the region have been slow to introduce and expand harm reduction programmes. In such a context, the HIV prevalence tends to rise drastically, as it has in Pakistan (from 11% in 2005 to 21% in 2008 (82)) and in Cebu, Philippines (from 0.6% to 53% in 2009-2011 (83)). Many people who inject drugs are sexually active, but the rates of consistent condom use among them tend to be low (84-87). Consequently, many of their sexual partners may be living with HIV. In Hanoi (Viet Nam), for example, 14% of the sexual partners of people who inject drugs tested HIV-positive in a 2008 study (88).

However, evidence also indicates that harm reduction efforts are working in Asia. In Bangladesh's capital, Dhaka, harm reduction programmes have been credited with slowing the spread of HIV among people who inject drugs (89). Prevalence in that key population at higher risk rose from 1.4% in 2000 to 7% in 2007 (90), but modelling suggests it could have exceeded 40% in the absence of those programmes. A peer

education and needle and syringe programme in Viet Nam's Lang Son province resulted in a decline in HIV prevalence from 46% to 23% among people who inject drugs between 2002 and 2010. In Ning Ming county (in China's Guangxi province), a similar programme was associated with a decline in HIV prevalence from 17% to 11% in the same period (91). In Malaysia, the HIV prevalence was much lower among participants in a methadone maintenance treatment programme (4%) than among those in the wider drug-injecting community (22%) (92).

#### **2.3.4 ... and the epidemic among men who have sex with men is growing**

Epidemics among men who have sex with men are growing across the region. In Thailand, that facet of the epidemic had been largely ignored until a study uncovered 17% prevalence among men who have sex with men in Bangkok in 2003 (93). The HIV prevalence found in subsequent studies was 31% in 2007 and 25% in 2009 (93). A recent three-year study found a 6% HIV incidence among men who have sex with men in Bangkok (94).

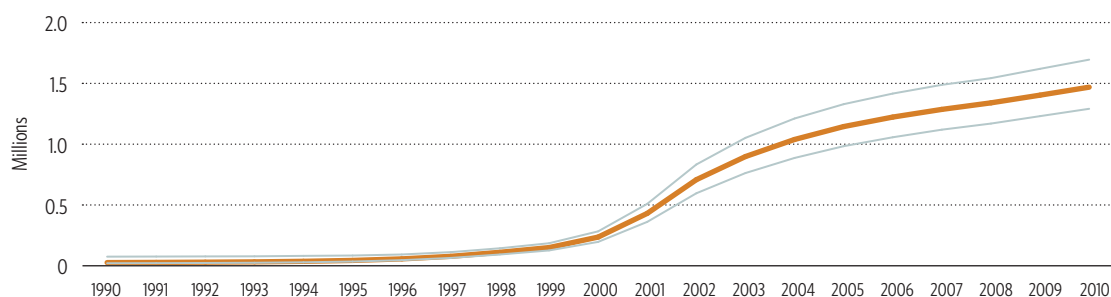
High prevalence - between 8% and 32% - has been found among surveyed men who have sex with men in cities in Indonesia (8% in Jakarta) (95), India (up to 18% in the south) (96), Myanmar (29%) (97) and Viet Nam. A recent review of studies in China has estimated a national HIV prevalence among men who have sex with men of 5.3% (98), considerably higher than the 1.8% national prevalence estimated for 2004-2005 in another study (99). The prevalence appears to be highest in south-western China (100). In the Philippines, outbreaks of HIV in this population group have been reported in Metro Manila (2% prevalence in 2010), Cebu (5% in 2010) and other cities (101).

Data for male sex workers and transgender people are scarce but show very high HIV prevalence: between 9% and 25% of surveyed male sex workers have tested HIV-positive in China (102), Indonesia and Thailand, for example, as have 34% of transgender (*hijra*) sex workers in Jakarta (Indonesia), 16% of their peers in Mumbai (India) and 14% of transgender people in Bangkok (Thailand) (103).

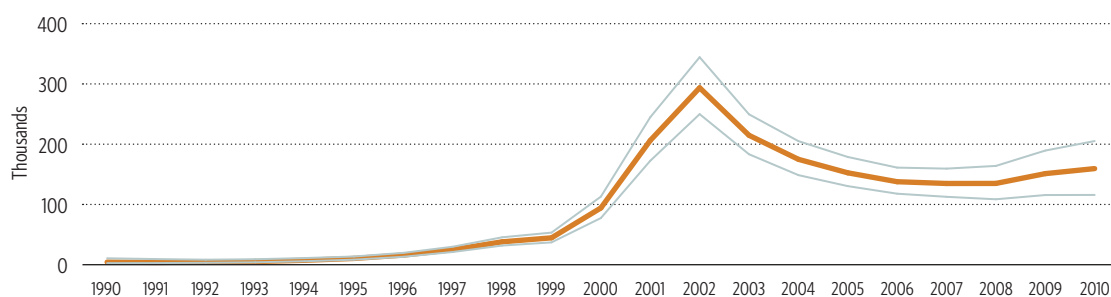
## 2.4 Eastern Europe and Central Asia

### 2.4.1 An epidemic that continues to grow

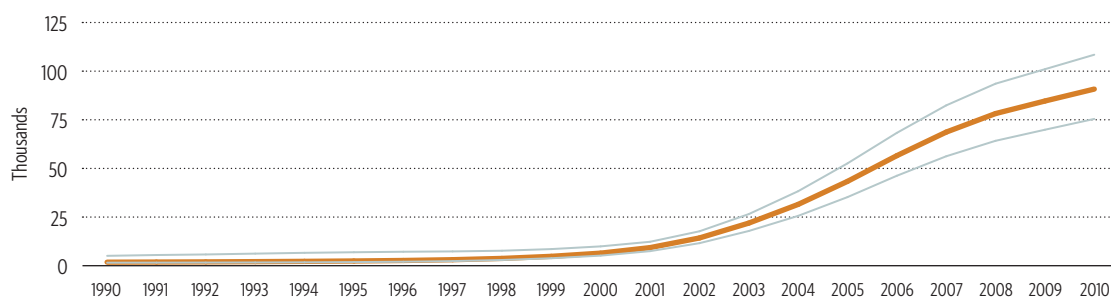
**Fig. 2.21** Number of people living with HIV, Eastern Europe and Central Asia, 1990–2010



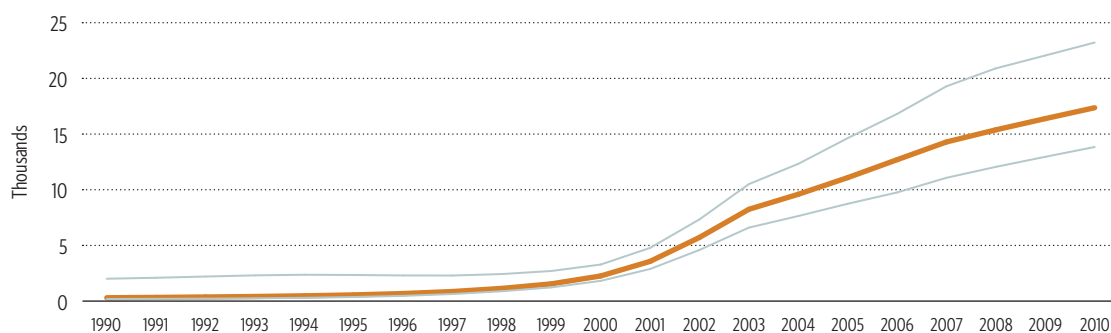
**Fig. 2.22** Number of people newly infected with HIV, Eastern Europe and Central Asia, 1990–2010



**Fig. 2.23** Number of people dying from AIDS-related causes, Eastern Europe and Central Asia, 1990–2010



**Fig. 2.24** Number of children 0–14 years old living with HIV, Eastern Europe and Central Asia, 1990–2010





Eastern Europe and Central Asia has had a steep increase since 2001 in the number of people living with HIV, increasing 250% from an estimated 410 000 [340 000–490 000] to 1.5 million [1 300 000–1 700 000] in 2010 (Table 2.1, Fig. 2.21–2.24). This reflects the rapid increase in the number of people newly infected with HIV around the turn of the century. The annual incidence of HIV infection slowed dramatically after 2002 but has begun accelerating again in the past few years. An estimated 160 000 [110 000–200 000] people acquired HIV infection in 2010 – 23% fewer than the 210 000 [170 000–240 000] estimated for 2001 but more than the estimated 130 000 [110 000–160 000] people newly infected annually in 2007 and 2008.

The prevalence of HIV infection among adults in 2009 was 1% [0.9–1.2%] in the Russian Federation and 1.1% [1.0–1.3%] in Ukraine. Together, those countries account for almost 90% of the people newly reported to be diagnosed with HIV infection in this region (104) and are home to twice as many people living with HIV as all of Western and Central Europe combined (105).

Overall, women comprised about 35% [30–40%] of adults living with HIV in Eastern Europe and Central Asia in 2010 (104). Although that proportion has stayed relatively steady since the turn of the century, about one fifth more children were newly infected with HIV in 2010 than in 2001: 2200 [1700–2900] versus 1800 [1500–2300]. The total estimated number of children living with HIV rose five-fold from 3400 [2800–4700] to 17 000 [14 000–23 000] in the same period, and the number of children dying from AIDS-related causes more than doubled from fewer than 500 [<500–<1000] to almost 1200 [<1000–1800].

Unlike most other regions, the number of people dying from AIDS-related causes continues to rise in Eastern Europe and Central Asia. The HIV epidemic claimed an estimated 83 000 [69 000–100 000] lives from AIDS-related causes in 2010 – 11 times more than the estimated 7800 [6000–11 000] in 2001.

The epidemic in this region began spreading rapidly in the late 1990s among people who inject drugs and later also among their sexual partners. In Ukraine, between 39% and 50% of the estimated 230 000–369 000 people who inject drugs are believed to be living with HIV (106), as are more than one third (37%) of the

1.5 million to 2 million people who inject drugs in the Russian Federation (104).

#### 2.4.2 Very high HIV prevalence among people who inject drugs

There is no sign yet that the epidemic in this region has peaked (104). The incidence of HIV infection among people who inject drugs in St Petersburg (Russian Federation), for example, was 8.1 per 100 person-years<sup>1</sup> in 2009 – almost twice the rate five years earlier (107). Newly reported diagnoses of people living with HIV have increased in Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan (104). Localized studies continue to reveal very high HIV prevalence among people who inject drugs: up to 59% in St Petersburg and 64% in Yekaterinburg (Russian Federation) (108), an average of 32% in 16 cities in Ukraine (109) and 42% in Balti, Republic of Moldova (110).

Large shares of these people living with HIV are undiagnosed: 53% of the people who inject drugs who tested HIV-positive in a study in St Petersburg did not know they were infected, versus 73% of those in Yekaterinburg and 80% of those in Omsk (all in the Russian Federation) (108).

Up to one third of sex workers in the Russian Federation are believed to inject drugs (111). The combination of unprotected sex and injecting drug use compounds the risk of acquiring and transmitting HIV infection. In Ukraine, an HIV prevalence of 43% has been found among sex workers who inject drugs versus 8.5% among those who did not inject (112). An estimated 35% of women living with HIV probably acquired HIV through injecting drug use, and an additional 50% were probably infected by partners who inject drugs (113). The use of non-sterile injecting equipment, in other words, remains the core driver of the epidemic in this region.

In the Russian Federation, an estimated 72% of the people living with HIV are younger than 30 years (114). However, the HIV prevalence in Ukraine among people who recently started injecting drugs appears to be declining (115). Overall in the region, most people diagnosed as living with HIV are 30–39 years old (116).

Significant proportions of women engaging in sex work in some countries are still in their teens. About 20% of

<sup>1</sup> This implies that if 100 people were followed for one year, 8.1 of those people would become newly infected during that year.

females selling sex in Ukraine (117) are believed to be younger than 19 years, and an HIV prevalence of 19% has been found among those aged 15-19 years (118). Street children in some countries are also at special risk: in a recent study in Donetsk, Kyiv and Odessa (Ukraine), HIV prevalence ranged as high as 28% among street children who were both orphaned and homeless (119).

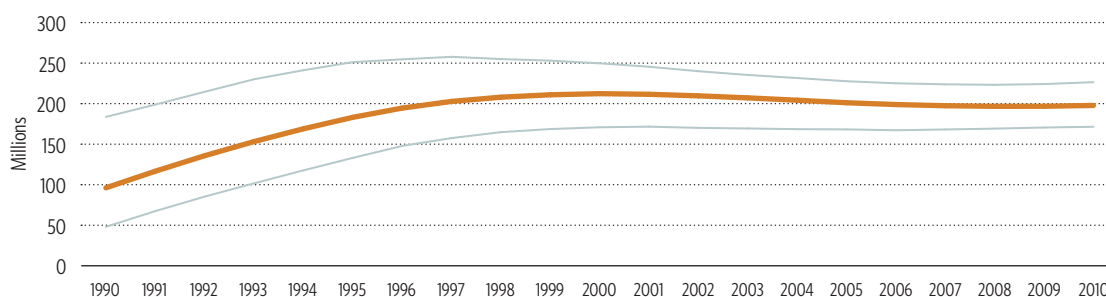
The available data indicate that unprotected sex between men is a minor contributor to the epidemics

in this region, accounting for less than 1% of the people newly diagnosed with HIV (for which the route of transmission was identified) (116). However, official data probably underplay the actual state of affairs. Small surveys among men who have sex with men have shown an HIV prevalence of up to 5% in Georgia, 6% in the Russian Federation (120) (and 16% among male sex workers in Moscow (121)) and between 4% (in Kyiv) and 23% (in Odessa) in Ukraine (106).

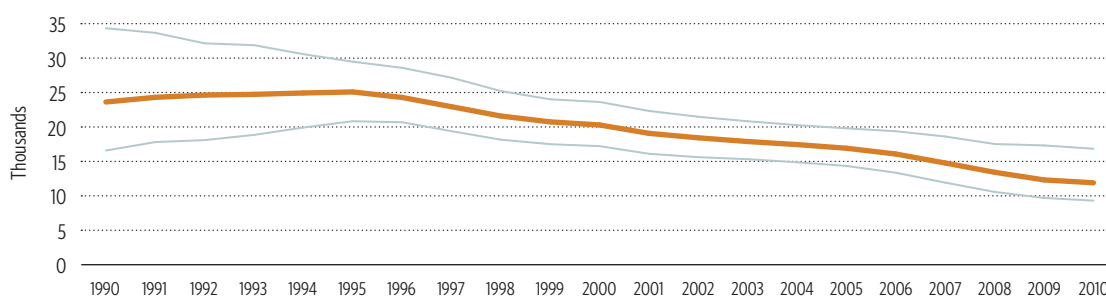
## 2.5 Caribbean

### 2.5.1 Fewer people newly infected and fewer people dying from AIDS-related causes

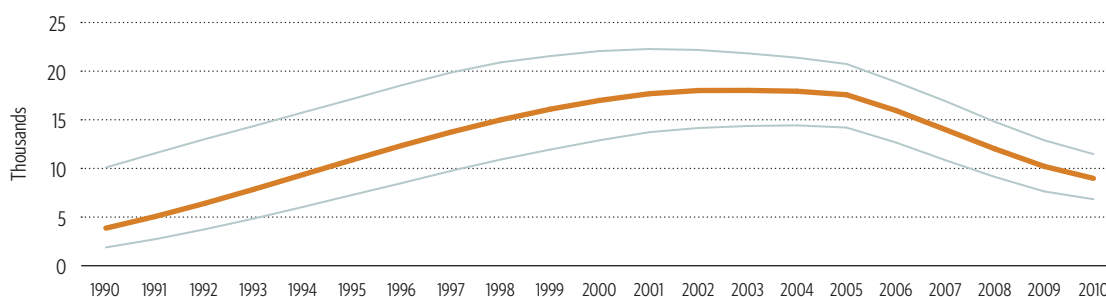
**Fig. 2.25** Number of people living with HIV, Caribbean, 1990-2010



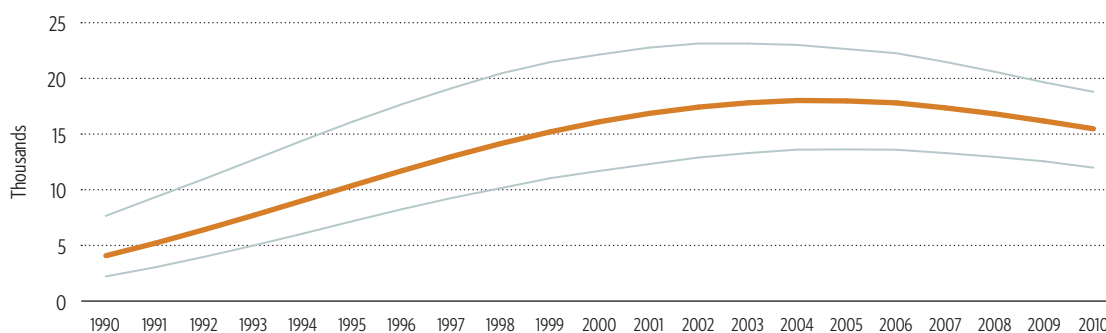
**Fig. 2.26** Number of people newly infected with HIV, Caribbean, 1990-2010



**Fig. 2.27** Number of people dying from AIDS-related causes, Caribbean, 1990-2010



**Fig. 2.28** Number of children 0-14 years old living with HIV, Caribbean, 1990-2010



The epidemic in the Caribbean has slowed significantly since the mid-1990s. The 12 000 [9400-17 000] people newly infected with HIV estimated for 2010 were more than one third fewer than the 19 000 [16 000-22 000] people who acquired HIV infection in 2001. The HIV incidence has declined by an estimated 25% in the Dominican Republic and Jamaica since 2001 and by about 12% in Haiti.

The number of people living with HIV has also declined slightly since the early 2000s - from about 210 000 [170 000-240 000] to 200 000 [170 000-220 000] in 2010, or about 1% [0.9-1.1%] of adults (Table 2.1, Fig. 2.25-2.28). The HIV prevalence among adults exceeds 1% in five of the seven larger countries in the region (122).

Increased access to antiretroviral therapy has led to a considerable drop in the number of people dying from AIDS-related causes. The 9000 [6900-12 000] people dying attributable to AIDS in 2010 were about half as many as the 18 000 [14 000-22 000] estimated to have died in 2001.

The Caribbean is the only region besides sub-Saharan Africa in which more adult women than men are living with HIV. In 2010, an estimated 53% [47-61%] of adults living with HIV were women (a proportion that has remained steady since the late 1990s). This mainly reflects the pattern of infection in Haiti (which has the largest epidemic in the region), the Bahamas, Belize and the Dominican Republic (123). In the most of the other countries in the region, men outnumber women among people living with HIV.

Slowing HIV incidence and increased access to services that can prevent the mother-to-child transmission of HIV has led to a 60% decline in the number of children newly infected with HIV (from 2900 [2200-3600] to 1200 [<1000-1700]) and a 47% decline in the number of children dying from AIDS-related causes (from 1900 [1400-2400] to 1000 [<1000-1300]) between 2001 and 2010. However, the progress is not uniform across the region. Coverage of programmes to prevent mother-to-child transmission is still low in countries such as the Bahamas, Belize and Haiti but is comparatively high in Barbados, the Dominican Republic and Guyana.

The island of Hispaniola, which contains the Dominican Republic and Haiti, is home to about 70% (182 000) of the people living with HIV in this region. Evidence

indicates that the epidemics in both these countries have declined in the past decade (124,125). The burden of HIV varies considerably between countries, however. Cuba's very low adult HIV prevalence of 0.1% [0.08-0.13%] in 2009 contrasts, for example, with a prevalence of 3.1% [1.2-5.4%] in the Bahamas.

There is also variation inside countries. In Jamaica, for example, the HIV prevalence is highest in the parishes of St James, Kingston and St Andrew (126), and in Haiti the departments of Nord and Les Nippes have the highest prevalence (127). In the Dominican Republic, the HIV prevalence in communities of sugar plantation workers (the *bateyes*) is nearly four times the national average (128).

### 2.5.2 Unprotected sex is the main route for HIV transmission ...

Unprotected sex between men and women and between men - including paid sex - are the main modes of HIV transmission in this region (129). The prevalence of HIV infection among female sex workers varies considerably - from 2% in the Dominican Republic (130) and 5% in Jamaica (123) to 17% in parts of Guyana and 24% in parts of Suriname (123).

Unprotected sex between men features in all the region's epidemics, but it is rarely acknowledged as a factor. Various studies since 2005 have found that the HIV prevalence among men who have sex with men ranges from more than 5% in four of the Dominican Republic's largest cities in 2008 (131) to almost 7% in Suriname, 8% in the Bahamas and 19% in Guyana. Preliminary results show that 33% of men who have sex with men participating in a 2011 study in Jamaica tested HIV-positive (as did 32% in a 2007 study) (132).

Many Caribbean countries still criminalize sexual relations between men (133). Many men who have sex with men also have sex with women. One third of the men participating in the Jamaica study cited earlier, for example, also had sex with women in the previous year (132).

In Bermuda and Puerto Rico, unsafe injecting drug use contributes significantly to the spread of HIV. In Puerto Rico, contaminated injecting equipment accounted for an estimated 40% of men becoming newly infected in 2006 and for 27% among women (134). Crack cocaine users appear to be another key affected group. The HIV prevalence is 5% in Jamaica and 7% in St Lucia. Studies

show that crack cocaine users often sell sex to support their drug habit and seem less likely to sustain safe sex behaviour (135,136).

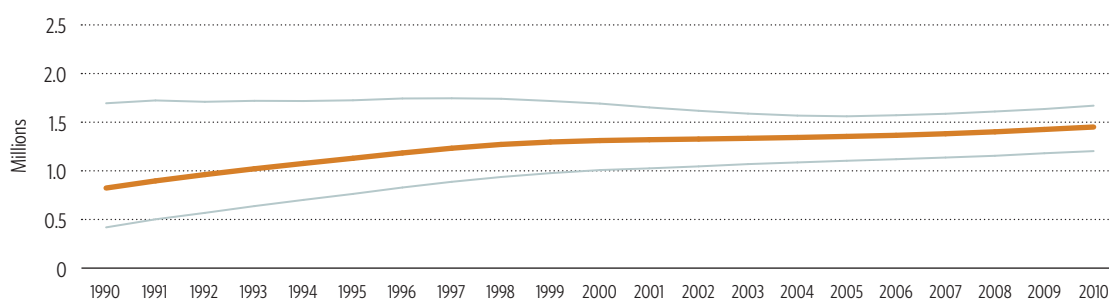
The criminalization of drug use and sex between men, along with unprotected forced sex, probably accounts

for the high HIV prevalence being found in detention facilities in some countries – 3% in Jamaica’s largest correctional facility (137) and close to 5% in Belize (123) and Guyana (138), for example.

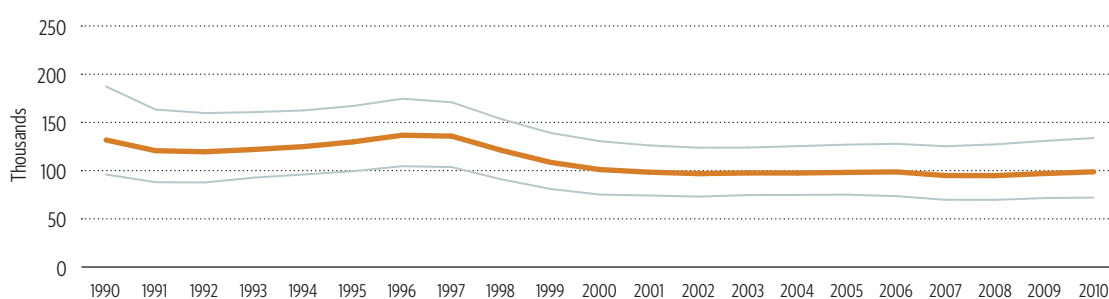
## 2.6 Latin America

### 2.6.1 A stable epidemic overall

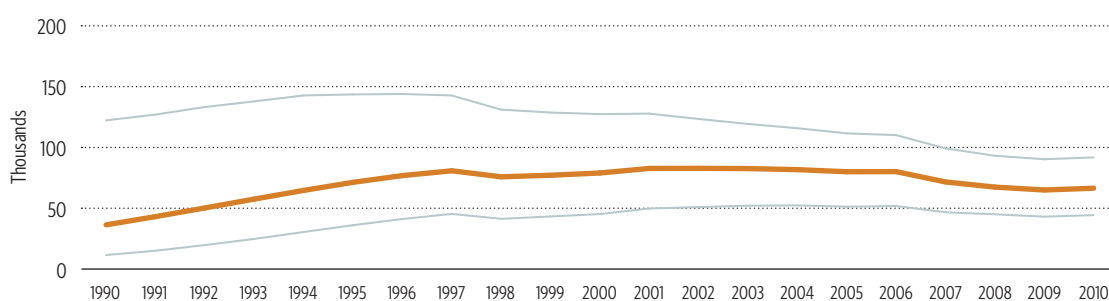
**Fig. 2.29** Number of people living with HIV, Latin America, 1990–2010



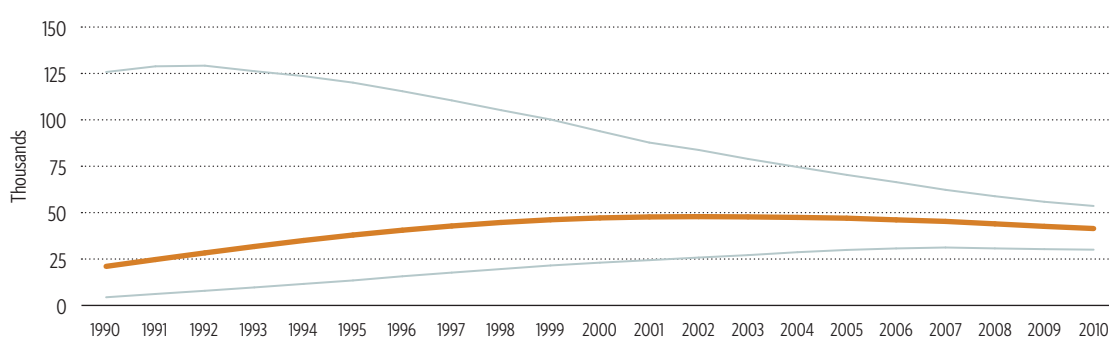
**Fig. 2.30** Number of people newly infected with HIV, Latin America, 1990–2010



**Fig. 2.31** Number of people dying from AIDS-related causes, Latin America, 1990–2010



**Fig. 2.32** Number of children 0–14 years old living with HIV, Latin America, 1990–2010



The HIV epidemics in Latin America are generally stable (Table 2.1, Fig. 2.29–2.32). A steady decrease in the annual number of people newly infected with HIV since 1996 levelled off in the early 2000s.<sup>1</sup> Since then, the estimated annual number of people acquiring HIV infection has varied between 99 000 [75 000–130 000] and 100 000 [73 000–140 000] (the latter figure for 2010).

The total number of people living with HIV in this region continues to grow and reached 1.5 million [1 200 000–1 700 000] in 2010, up from 1.3 million [1 000 000–1 700 000] in 2001. This increase is partly attributable to the increase in the number of people living with HIV receiving antiretroviral therapy, which has helped reduce the annual number of people dying from AIDS-related causes to 67 000 [45 000–92 000] in 2010, down from a peak of 83 000 [50 000–130 000] in 2001–2003. More than one third (36%) of the adults living with HIV in this region in 2010 were women.

The number of children younger than 15 years living with HIV in this region has declined from about 47 000 [23 000–94 000] in 2001 to 42 000 [30 000–54 000] in 2010. The same period also saw a considerable decrease in the number of children newly infected (from 6300 to 3900, or 38%) and the number of children dying from AIDS-related causes (4400 to 2700, or 39%) between 2001 and 2010.

Brazil, the most populous country in the region, is home to about one third of the people living with HIV in Central and South America. However, the adult HIV prevalence in Brazil has never reached 1%. An early well-coordinated response, protection of human rights and a focus on preventing HIV infection among men who have sex with men, people who inject drugs and female sex workers with large, evidence-informed programmes helped Brazil to avoid a potentially much larger HIV epidemic (139).

### 2.6.2 Unprotected sex between men is fuelling the epidemic

In most of the HIV epidemics in this region, HIV is spreading predominately in and around networks of men who have sex with men. During the past decade, surveys have found HIV prevalence of at least 10%

among men who have sex with men in 9 of 14 countries in the region, with infection levels as high as 19% in parts of Colombia and Uruguay, 21% in Bolivia (140) and more than 12% on average in the 10 cities in Brazil (141) and three cities in Honduras that conducted studies (142). An earlier review (143) concluded that men who have sex with men in 15 countries in South and Central America were 33 times more likely to be living with HIV compared with other men in the general population.

A 2010 longitudinal cohort study in Nicaragua's two largest provinces (Managua and Chinandega) found an incidence of 3% among men who have sex with men, only about one third of who said they used condoms consistently (144). In 2009, a study reported an incidence of 3.5% in men who have sex with men who attended public health clinics in Lima, Peru (145). In San Pedro Sula, Honduras, 9% of 18- to 24-year-old men who have sex with men were living with HIV, indicating high rates of HIV transmission (146).

Very little data exist on HIV trends among male and transgender sex workers. A study in 13 cities in Argentina uncovered alarming incidence rates in 10.7 per 100 person-years among transgender sex workers and 2.3 per 100 person-years among male sex workers (147). One third (34%) of the transgender sex workers were living with HIV (148). In Campinas, Brazil, a 2008 study found an HIV prevalence of 14% among male sex workers (versus 6% among other men who have sex with men) (149).

Many men who have sex with men also have sex with women. For example, in the 2010 Nicaragua study cited above (144), 40% of men who have sex with men in Managua and 57% of those in Chinandega said they had had sex with women in the previous year.

Few national HIV programmes focus sufficiently on preventing and treating HIV infection among men who have sex with men. Of the 12 countries reporting spending on prevention activities, only Peru directed more than 5% of its HIV prevention spending toward prevention programmes for men who have sex with men (150). This misallocation of resources is especially evident in Central America and in the Andean region (151).

Generally, countries have been more inclined to address HIV transmission during paid sex – and with apparent

<sup>1</sup> Previously published UNAIDS estimates for Latin America did not include Mexico, which is now included in this region. These new HIV estimates (including the estimates for previous years) therefore supersede those published previously for Latin America.

success in some places. High condom use rates and zero HIV prevalence have been reported among female sex workers in Santiago, Chile (152), while in Guatemala high rates of condom use accompanied a drop in HIV incidence among female sex workers (from 1.85 per 100 person-years in 2005 to 0.4 in 2008) (153). On the other hand, HIV prevalence was 3% among the 317 female sex workers tested in a recent study in Buenos Aires, Argentina (154), and the annual HIV incidence was 0.8% among female sex workers in Managua and Chinandega, Nicaragua, in 2009 (155).

Studies are also revealing a high prevalence of sexually transmitted infections (especially herpes simplex virus 2, which is believed to increase the risk of acquiring HIV) among female sex workers, which indicates that unprotected paid sex is far from unusual.

The prevalence of herpes simplex virus 2 was 77% in Panama City in a 2009–2010 study (156) and 76% and 84% in the Nicaragua study (155), for example.

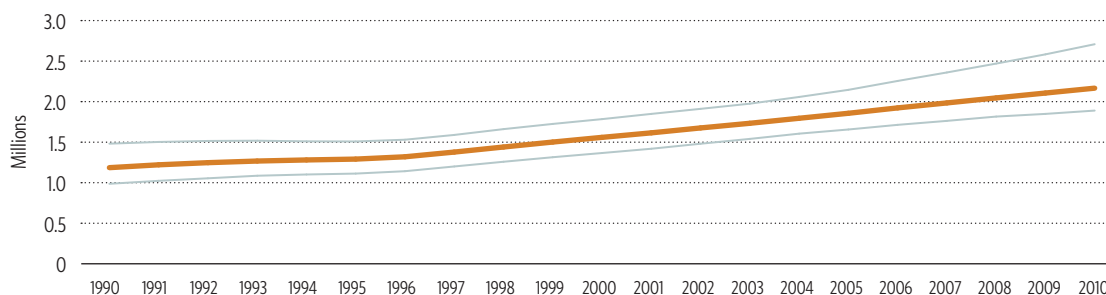
Injecting drug use is another significant route of HIV transmission in this region, especially in the southern cone of South America, and in Mexico (which has a sizeable HIV epidemic, with about 220 000 adults and children living with HIV in 2009). The interplay of the drug and sex trades appears to be an important factor in Mexico's epidemic, especially along the border with the United States (157). The HIV prevalence was 12% in 2007 among female sex workers in Tijuana and Ciudad Juarez who injected drugs (158). Recent data on HIV trends among people who inject drugs in other countries in this region are scarce.



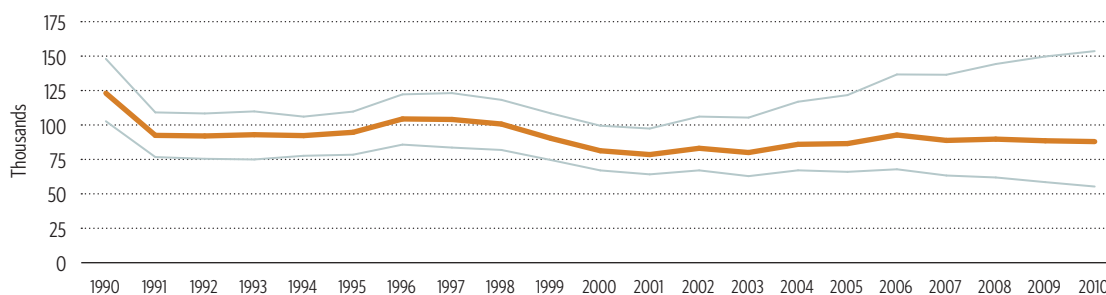
## 2.7 North America and Western and Central Europe

### 2.7.1 A largely stable epidemic

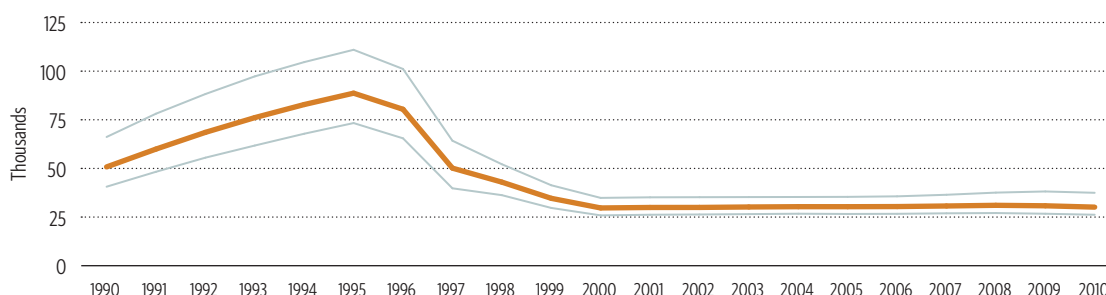
**Fig. 2.33** Number of people living with HIV, North America and Western and Central Europe, 1990–2010



**Fig. 2.34** Number of people newly infected with HIV, North America and Western and Central Europe, 1990–2010



**Fig. 2.35** Number of people dying from AIDS-related causes, North America and Western and Central Europe, 1990–2010



The HIV epidemic in North America and Western and Central Europe remains stable overall, with the incidence of HIV infection having changed little since 2004. An estimated 88 000 [56 000–150 000] people were newly infected with HIV in 2010, most of them in the United States of America. According to the United States Centers for Disease Control and Prevention, the HIV incidence in the United States has been relatively stable in the past few years, with between 48 600 and 56 000 people acquiring HIV infection annually between 2006 and 2009 (159).

The total number of people living with HIV in North America and Western and Central Europe reached an estimated 2.2 million [1 900 000–2 700 000] in 2010, about one third (34%) more than the 1.6 million [1 400 000–1 800 000] in 2001 (Table 2.1, Fig. 2.33–2.35). More than half (about 1.2 million) of the people with HIV in this region live in the United States.

The rising number of people living with HIV reflects the wide-scale availability of antiretroviral therapy, especially in the countries with the largest epidemics,

which has significantly reduced AIDS-related mortality. The number of people dying from AIDS-related causes has varied little since 2000 (despite the 34% increase in the number of people living with HIV) and totalled about 30 000 [26 000–37 000] in 2010.

The epidemic's recent trends vary across this region. The rates of diagnosed HIV cases doubled between 2000 and 2009 in Bulgaria, Czech Republic, Hungary, Lithuania, Slovakia and Slovenia and increased by more than 50% in the United Kingdom (116). In contrast, the number of people newly diagnosed with HIV decreased by more than 20% in Latvia, Portugal and Romania (116).<sup>1</sup>

### 2.7.2 Unprotected sex between men is fuelling HIV transmission

Unprotected sex between men continues to be the main driver of HIV transmission in this region (116), with injecting drug use and unprotected paid sex being minor factors. In the United States, for example, men who have sex with men represent about 2% of the total population but account for 57% of the people newly infected (160,161). The HIV incidence in the United States increased during 2006–2009 among young men who have sex with men and especially among African-American men who have sex with men (159).

This epidemic pattern means that, across this region, men outnumber women among people living with HIV. In 2010, 26% of the people living with HIV in North America and Western and Central Europe were women, a proportion that has changed little since the late 1990s.

The HIV epidemics among men who have sex with men appear to be resurgent in North America and much of western Europe (162). In Western and Central Europe, the number of men who have sex with men newly diagnosed with HIV infection increased from 7601 in 2004 to 9541 in 2009 (116). The 3080 men who have sex with men newly diagnosed in the United Kingdom in 2010 was the highest annual number yet (163). Trends of increasing numbers of people living with HIV in this key population at higher risk are also evident in Belgium (164), France (165), Germany (166), the Netherlands (166), Slovenia (167) and Spain (168,169).

<sup>1</sup> People who are newly diagnosed with HIV infection did not necessarily acquire HIV infection recently, nor does this reflect the actual number of people newly infected. But where HIV testing coverage remains relatively consistent, trends in the numbers of people newly diagnosed with HIV can provide a useful picture of recent trends in the epidemic.

The HIV incidence among men who have sex with men in the United Kingdom is estimated to have increased from 0.5% [0.1–0.8%] in 2002 to 0.9% [0.5–1.3%] in 2007 (170). In France, about 50% of the men who have sex with men newly diagnosed with HIV infection between 2003 and 2008 had acquired infection recently (165). In the United Kingdom, one quarter of the men newly diagnosed with HIV in 2010 had become infected 4–5 months before diagnosis (171). In the United States of America, the estimated number of men who have sex with men newly infected with HIV increased by 17% from 2005 to 2008 in the 37 states with sufficient data (172,173). In New York City, the HIV incidence in 2005–2008 more than doubled among men who have sex with men, and syphilis rates increased six-fold among those aged 18–29 years (174) – an indication of increased sexual risk-taking (175). Similar trends have been reported in Canada (176). This underscores the need for ongoing prevention efforts, especially ones tailored for young men who have sex with men.

### 2.7.3 HIV infection trends are showing significant racial, ethnic and socioeconomic disparities

In the United States of America, the increase in HIV diagnoses has been especially marked among black men who have sex with men, especially those who are young (177,178). National behavioural surveillance data for 2008 showed a 28% HIV prevalence among African-American men who have sex with men versus 18% among Hispanics and 16% among whites (179).

Those racial and ethnic disparities are mirrored also in the overall HIV epidemic in the United States (180), with blacks disproportionately affected. Despite representing less than 14% of the country's total population, African-Americans accounted for half the people diagnosed with HIV infection in 37 states in 2005–2008 (181,182). Blacks have an estimated 1 in 22 lifetime risk of receiving an HIV diagnosis versus 1 in 170 for whites and 1 in 52 for Hispanics (181).<sup>2</sup>

Socioeconomic divides appear to be equally important in the epidemic in the United States. A study in 23 cities found an average HIV prevalence of 2.1% among heterosexual residents of high-poverty areas (183). The HIV prevalence was inversely related to annual household income – the lower the income, the higher

<sup>2</sup> Lifetime risk refers to the probability, at the day of birth, that an individual will be diagnosed with HIV infection at some point during his or her lifetime.

the HIV prevalence. HIV prevalence did not differ by race or ethnicity in that population. The researchers concluded that poverty may account for some of the racial and ethnic disparities found in HIV prevalence rates for the overall population in the United States – 46% of African-Americans and 40% of Hispanics live in high-poverty areas versus just 10% of whites (184).

In Canada, meanwhile, Aboriginal people continue to be overrepresented in the HIV epidemic. Although they comprise less than 4% of Canada's population, they accounted for 8% of the total number of people living with HIV and almost 13% of the people newly infected in 2008 (185). Injecting drug use was the probable cause for most of the Aboriginal Canadians newly infected (66% versus 17% for all Canadians) (185).

Immigrants living with HIV have become a growing feature of the epidemics in several countries in Europe. In Western and Central Europe, 49% of the people newly diagnosed with HIV infection acquired through heterosexual transmission originated from countries with generalized epidemics (in sub-Saharan Africa, the Caribbean and Asia) (116). In the United Kingdom, for example, two thirds of the heterosexuals newly diagnosed with HIV infection in 2009 had probably acquired HIV infection, mainly in sub-Saharan Africa (186). However, the number of diagnoses among people infected heterosexually outside the country has decreased in the United Kingdom since 2003 (186), and diagnoses among people who most likely were infected inside the United Kingdom have risen (from 210 in 1999 to 1150 in 2010) (171).

The decline in the rates of new infections among people who inject drugs in western Europe and parts

of central Europe appears to be continuing and has been attributed to harm-reduction services (187). Injecting drug use continues to drive the epidemic in Estonia, which has the highest national HIV prevalence among adults in all of Europe (1.2%). The HIV incidence among new injectors has declined significantly since 2005, however. The estimated HIV incidence among people who inject drugs in Tallinn (Estonia), for example, slowed from 18 to 8 per 100 person-years between 2005 and 2009, a period when the needle and syringe programme expanded significantly (188).

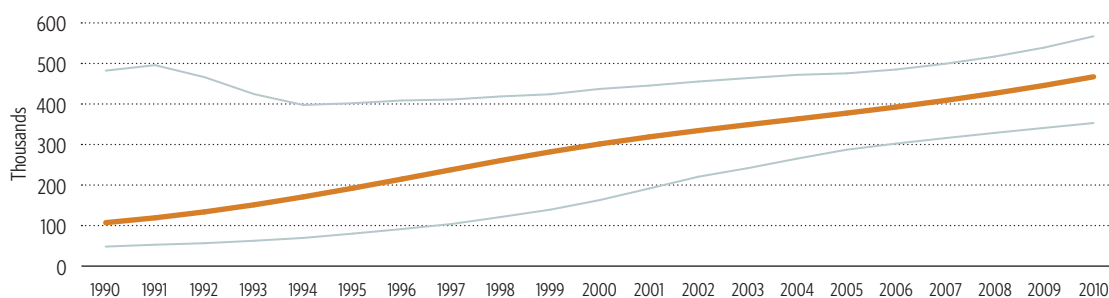
Injecting drug use also appears to be fuelling the more recent epidemic in Poland, where 18% of people who inject drugs tested in 2009 in eight regions were living with HIV (189). However, the absolute numbers of people who inject drugs newly diagnosed with HIV infection have decreased (from 201 in 2004 to 39 in 2009) (116). In Greece, the 113 people who inject drugs newly diagnosed with HIV in the first seven months of 2011 was almost nine times higher than the average annual number of people who inject drugs diagnosed in the previous decade (190).

Considering the overall scale of the epidemic in this region, the estimated number of children living with HIV is very small: slightly more than 6000 [3500–8000] in 2010. This reflects both the centrality of sex between men in the epidemic and the extensive provision of services that can prevent the mother-to-child transmission of HIV. Remarkably few children younger than 15 years have been newly infected with HIV (<500) or died from AIDS-related illnesses (<500) in this region in 2010.

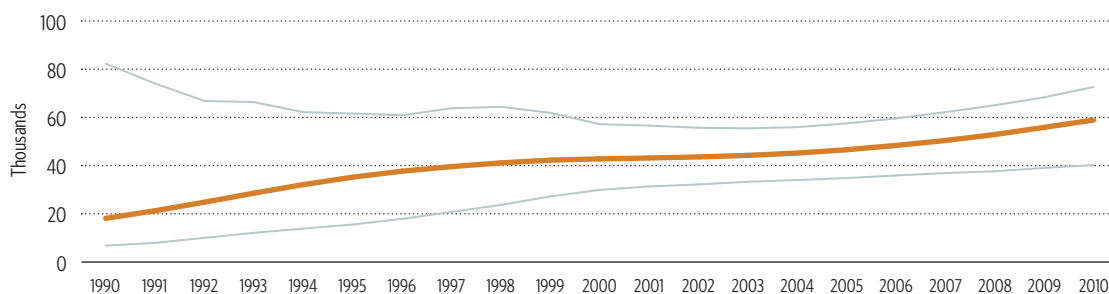
## 2.8 Middle East and North Africa

### 2.8.1 Another growing epidemic

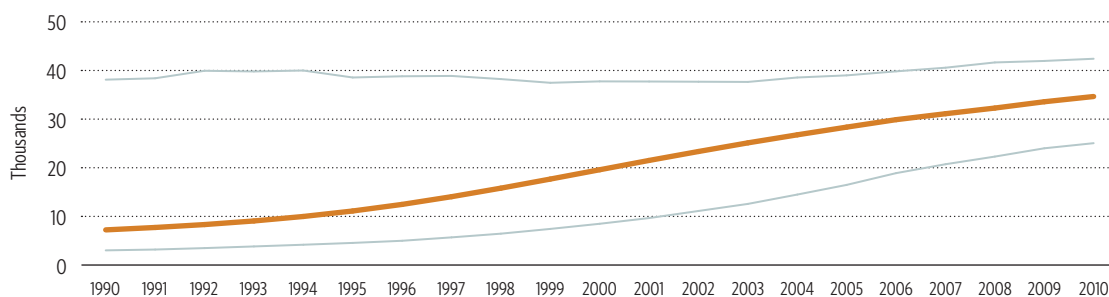
**Fig. 2.36** Number of people living with HIV, Middle East and North Africa, 1990-2010



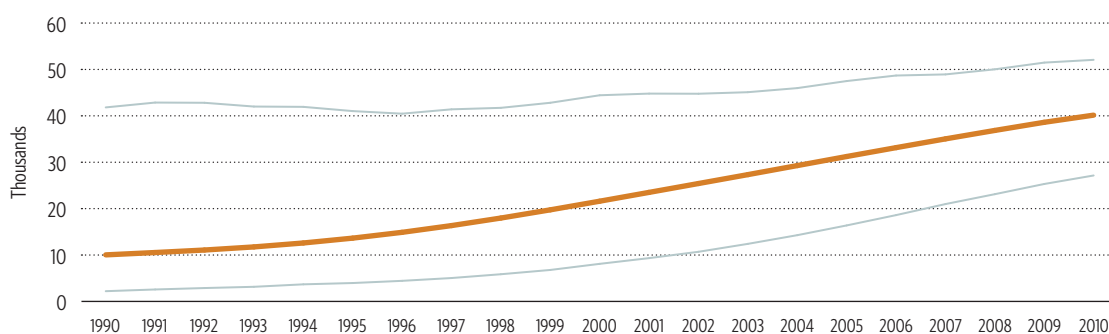
**Fig. 2.37** Number of people newly infected with HIV, Middle East and North Africa, 1990-2010



**Fig. 2.38** Number of people dying from AIDS-related causes, Middle East and North Africa, 1990-2010



**Fig. 2.39** Number of children 0-14 years old living with HIV, Middle East and North Africa, 1990-2010



The available evidence on the HIV epidemics in the Middle East and North Africa indicates ongoing increases in the number of people newly infected with HIV, the number of people living with HIV and the number of people dying from AIDS-related causes. The estimated 59 000 [40 000–73 000] people newly infected with HIV in 2010 was the highest annual number yet, 36% more than the 43 000 [31 000–57 000] people estimated to have been newly infected in 2001. In the same period, the estimated number of people living with HIV rose steeply, from 320 000 [190 000–450 000] to 470 000 [350 000–570 000] (Fig. 2.38–2.39), as did the number of people dying from AIDS-related causes, which increased from 22 000 [9700–38 000] in 2001 to 35 000 [25 000–42 000] in 2010.

The national HIV prevalence among adults in the Middle East and North Africa is low – except for Djibouti and South Sudan, where HIV is spreading in the general population, and where at least 1% of pregnant women using antenatal services have tested HIV-positive.

Overall, the number of children younger than 15 years living with HIV almost doubled from 24 000 [9400–45 000] to 40 000 [27 000–52 000] between 2001 and 2010. The number of children newly infected rose from 5400 [2700–7600] to 6800 [4800–8800], and the number of children dying from AIDS-related causes increased from 2600 [1100–4300] to 3900 [2700–5000] in the same period. This reflects an accelerating epidemic and the comparatively high proportions of women among the people living with HIV (44–45% in 2001–2010) along with the generally inadequate provision of services to prevent the mother-to-child transmission of HIV.

### **2.8.2 The major factors are injecting drug use and unprotected sex ...**

HIV data in the region have improved but remain limited. Current research indicates that unprotected sex (including between men) and the sharing of non-sterile drug-injecting equipment remain the primary drivers of HIV infection in the Middle East and North Africa (191). Most people newly infected with HIV are men and

live in urban settings (except in Sudan, where more women and people living in rural areas are acquiring HIV infection). Some evidence indicates that many returning migrants are living with HIV and transmit HIV to their spouses (191). Indeed, many women living with HIV are believed to have acquired infection from their spouses, who practice high-risk behaviour (191). Women comprised an estimated 41% of adults living with HIV in the Middle East and North Africa in 2010.

The Islamic Republic of Iran is believed to have the largest number of people who inject drugs in the region, and its HIV epidemic is concentrated mainly within this population group. An estimated 14% of the people who inject drugs countrywide were living with HIV in 2007 (192). Exposure to contaminated drug-injecting equipment also features in the epidemics of Algeria, Egypt (where 7% of men who inject drugs in Alexandria and 8% of those in Cairo tested HIV-positive in 2010 (193)), Lebanon, Libya, Morocco (up to 6% prevalence (194)), Oman, the Syrian Arab Republic and Tunisia.

### **2.8.3 ... including unprotected sex between men**

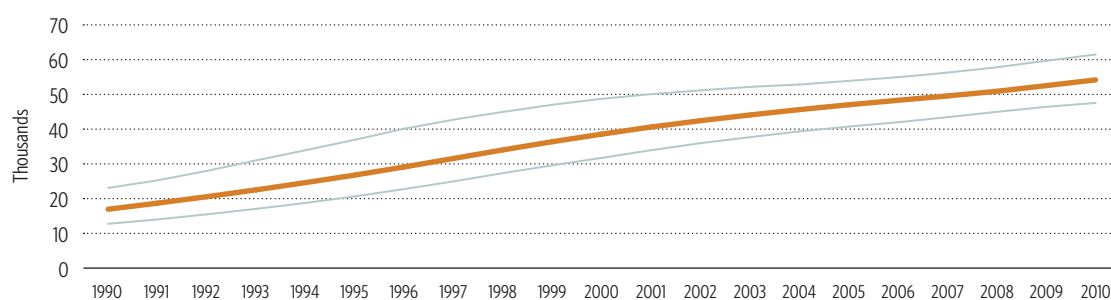
Sex between men is heavily stigmatized in this region and is deemed a criminal offence in many countries. High-risk sexual practices, low levels of condom use and generally low levels of HIV knowledge have been observed in several countries among men who have sex with men (139). In surveys in Sudan, 8–9% of men who have sex with men tested HIV-positive (120), as have 5% of their peers in Cairo and 7% of those in Alexandria (Egypt) (193), 5% in Tunisia (195) and 4% in Morocco (196). There are signs of expanding investment in HIV prevention programmes for this key population at higher risk in some countries, but service coverage remains limited (139).

In most countries, the prevalence of HIV among female sex workers remains relatively low. However, up to 2–4% of female sex workers in parts of Algeria, Morocco and Yemen are believed to be living with HIV (197), and the HIV prevalence is between 0% (198) and 7% (199) among female sex workers in Morocco (with the highest level in Sous Massa Draa) (200).

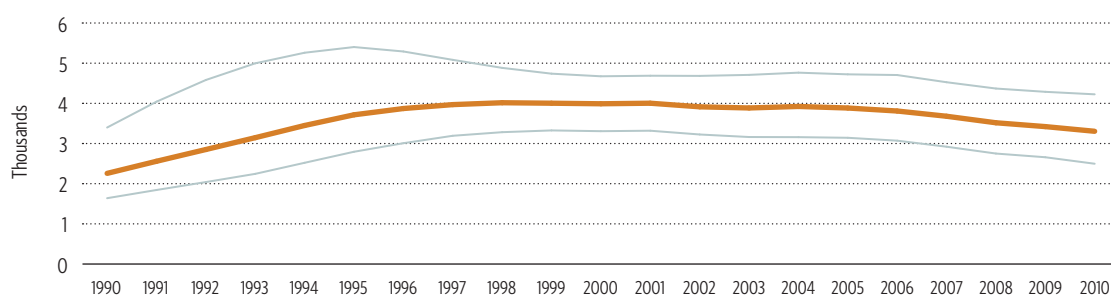
## 2.9 Oceania

### 2.9.1 A small, stable epidemic

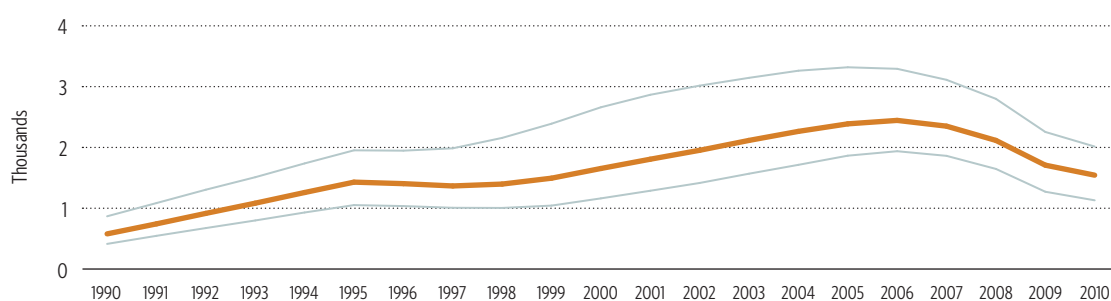
**Fig. 2.40** Number of people living with HIV, Oceania, 1990–2010



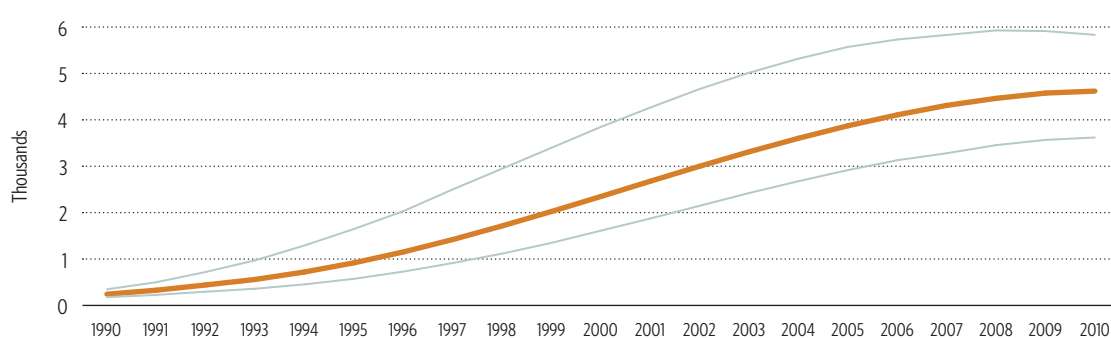
**Fig. 2.41** Number of people newly infected with HIV, Oceania, 1990–2010



**Fig. 2.42** Number of people dying from AIDS-related causes, Oceania, 1990–2010



**Fig. 2.43** Number of children 0–14 years old living with HIV, Oceania, 1990–2010



The HIV epidemic in Oceania remains small and appears to be stable. The annual number of people newly infected with HIV increased slowly until the early 2000s and then declined to 3300 [2400–4200] in 2010 (down from about 4000 [3300–4600] in 2001). The number of people living with HIV in this region reached an estimated 54 000 [48 000–62 000] at the end of 2010, about 34% more than the estimate of 40 000 [34 000–50 000] for 2001 (Table 2.1, Fig. 2.40–2.43). The number of people dying from AIDS-related causes has decreased considerably, falling to 1600 [1200–2000] in 2010 (compared with the annual figure of about 2400 [1900–3300] in 2005–2007).

Scattered over one third of the world's surface, almost all the 22 Pacific island countries and territories are experiencing very small HIV epidemics. In each of them, fewer than 500 HIV cases have been reported since 1985. The one exception is Papua New Guinea, which has the largest and the only generalized HIV epidemic in Oceania (201).

The national HIV prevalence among adults in Papua New Guinea in 2009 was an estimated 0.9% [0.8–1.0%], with about 34 000 [30 000–39 000] people living with HIV. An increase in the number of sites providing HIV tests has led to an improvement in the volume and quality of HIV data, which now indicate that the country's epidemic might have stabilized.

A lack of high-quality survey data creates difficulty in determining the role of sex work in Papua New Guinea's epidemic. A 2010 study among people who sold or exchanged sex in Port Moresby found an (unadjusted) HIV prevalence of 19% among women, 9% among men and 24% among transgender people (202). Paying for sex appears to be common among mobile populations, including migrant workers, transport workers and military personnel (203). Sex between men is also common, with up to 13% of surveyed truckers, sugar workers, port workers and military personnel reporting sex with other men (204).

The next largest epidemic in the region is in Australia, where the annual number of people newly diagnosed with HIV infection has stayed relatively stable at about 1000 since 2005 (following an earlier increase up to the late 1990s) (205). In New Zealand's smaller epidemic, the annual number of people newly diagnosed peaked at about 180 in 2005–2006 before decreasing to about 160 (206).

### 2.9.2 Unprotected sex is the main driver of HIV transmission

Most people diagnosed with HIV infection in Oceania have acquired HIV through sexual transmission (207). Unprotected heterosexual intercourse is the main mode of transmission in Papua New Guinea (208) (and in the rest of Melanesia), whereas unprotected sex between men plays a larger role in the epidemics in Micronesia and Polynesia and in those of Australia and New Zealand. In Australia, men who have sex with men accounted for 85% of the people newly diagnosed with HIV infection in 2009 (205). An increase in the number of men who have sex with men newly diagnosed in Australia abated after 2005, and the number newly diagnosed has stayed relatively steady since then (205). New Zealand has a similar trend (206).

Although the HIV prevalence is low in most of Oceania, the high prevalence of other sexually transmitted infections is a concern, since people who have another sexually transmitted infection have a higher risk of HIV transmission (207). In Papua New Guinea, for example, the prevalence of sexually transmitted infections has increased, especially among young women and rural dwellers as well as in the Southern and Highlands regions (209).

Injecting drug use plays a minor role in the epidemics in this region. In French Polynesia, about 12% of the cumulative reported HIV cases have been attributed to injecting drug use (207). Nevertheless, in Australia in 2009, injecting drug use was the probable cause of transmission for about 20% of the Aboriginal and Torres Strait Islander people newly infected with HIV (205).

The proportion of women among the people newly diagnosed with HIV in the Pacific region has increased steadily, although this might partly result from increased antenatal testing. By the end of 2009, women comprised 60% of the people newly diagnosed in Papua New Guinea and about 30% elsewhere (207). Overall, women comprised about 44% of the adults living with HIV in Oceania in 2010. However, mother-to-child transmission of HIV is a significant factor only in Papua New Guinea's epidemic, where nearly 10% of all people newly diagnosed with HIV to date acquired it during perinatal exposure (210). Overall, about 4600 [3600–5800] children were living with HIV in Oceania in 2010, 500 [<500–<1000] of whom were newly infected in 2010.

## Box 2.4

### The latest improvements in estimates on HIV and AIDS

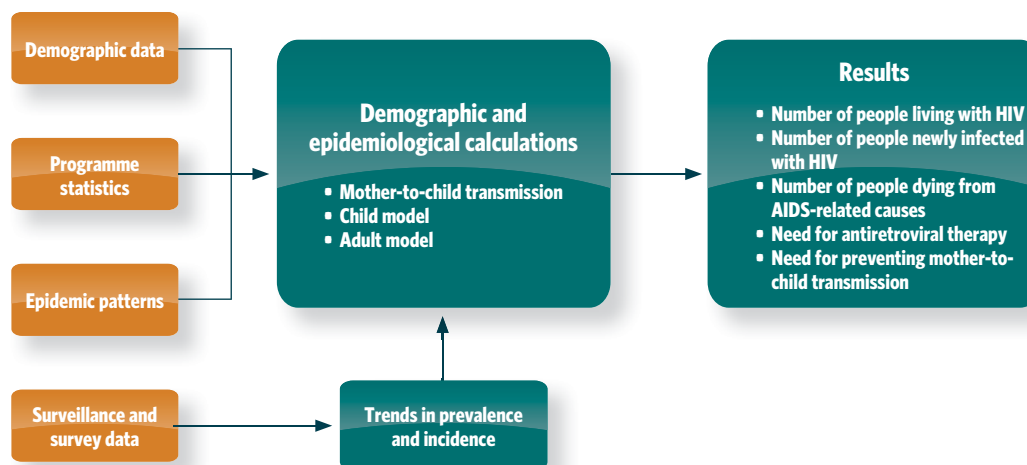
Estimates for countries and regions are generated with the Spectrum software package (211), using all pertinent, available data - including surveys of pregnant women attending antenatal clinics, population-based surveys (conducted at the household level), sentinel surveillance among key populations at higher risk of HIV infection, case reporting, information on antiretroviral therapy and on programmes for preventing mother-to-child infection and demographic data (Fig. 2.44). The current models use the 2010 revision of demographic estimates and projections produced by the United Nations Population Division (212).

Projection assumptions are updated regularly using the latest available research. For this reason, the latest estimates (for the current year and for past years) tend to be more accurate and reliable than those produced in previous years.<sup>1</sup>

The latest version of the software merges the Spectrum and Estimates and Projection Program (EPP) models into one package. This has made it easier for countries to produce their own HIV estimates. The combined model has been updated to be more flexible in fitting the prevalence curves to available surveillance and survey data. This is especially important for capturing changes in the prevalence of HIV infection that occur because of the expanding coverage of antiretroviral therapy, and to fit epidemics in which the HIV prevalence has declined sharply and then stabilized or risen again.

In the latest version of the software, the speed of progression from people being newly infected with HIV to dying depends on age. People infected at younger ages progress more slowly than those infected at older ages. As a result, the estimated number of young people living with HIV is higher than in previous estimates. This also raises the estimated number of women needing services for preventing mother-to-child transmission and the number of children newly infected.

Fig. 2.44 Process of producing HIV and AIDS estimates



<sup>1</sup> For a technical description of the processes used to arrive at the estimates and a detailed description of the methods, software, quality of data and development of ranges, please see a series of articles published in a supplement in the journal *Sexually Transmitted Infections* in December 2010 (213). The articles are open access and can be downloaded for free.



**Table 2.1 HIV and AIDS statistics by geographical region, 2001 and 2010**

	Adults and children living with HIV	Adults and children newly infected with HIV	Prevalence of HIV infection among adults (%)	Adults and children dying from AIDS-related causes	Prevalence of HIV infection among people 15–24 years old (%)	
					Men	Women
<b>Sub-Saharan Africa</b>						
2010	22 900 000 [21 600 000–24 100 000]	1 900 000 [1 700 000–2 100 000]	5.0 [4.7–5.2]	1 200 000 [1 100 000–1 400 000]	1.4 [1.1–1.8]	3.3 [2.7–4.2]
2001	20 500 000 [19 100 000–22 200 000]	2 200 000 [2 100 000–2 400 000]	5.9 [5.6–6.4]	1 400 000 [1 300 000–1 600 000]	2.0 [1.6–2.7]	5.2 [4.3–6.8]
<b>Middle East and North Africa</b>						
2010	470 000 [350 000–570 000]	59 000 [40 000–73 000]	0.2 [0.2–0.3]	35 000 [25 000–42 000]	0.1 [0.1–0.2]	0.2 [0.1–0.2]
2001	320 000 [190 000–450 000]	43 000 [31 000–57 000]	0.2 [0.1–0.3]	22 000 [9700–38 000]	0.1 [0.1–0.2]	0.1 [0.1–0.2]
<b>South and South-East Asia</b>						
2010	4 000 000 [3 600 000–4 500 000]	270 000 [230 000–340 000]	0.3 [0.3–0.3]	250 000 [210 000–280 000]	0.1 [0.1–0.2]	0.1 [0.1–0.1]
2001	3 800 000 [3 400 000–4 200 000]	380 000 [340 000–420 000]	0.3 [0.3–0.4]	230 000 [200 000–280 000]	0.2 [0.2–0.2]	0.2 [0.2–0.2]
<b>East Asia</b>						
2010	790 000 [580 000–1 100 000]	88 000 [48 000–160 000]	0.1 [0.1–0.1]	56 000 [40 000–76 000]	<0.1 [<0.1–<0.1]	<0.1 [<0.1–<0.1]
2001	380 000 [280 000–530 000]	74 000 [54 000–100 000]	<0.1 [<0.1–0.1]	24 000 [16 000–45 000]	<0.1 [<0.1–<0.1]	<0.1 [<0.1–<0.1]
<b>Oceania</b>						
2010	54 000 [48 000–62 000]	3300 [2400–4200]	0.3 [0.2–0.3]	1600 [1200–2000]	0.1 [0.1–0.1]	0.2 [0.1–0.2]
2001	41 000 [34 000–50 000]	4000 [3300–4600]	0.2 [0.2–0.3]	1800 [1300–2900]	0.1 [0.1–0.2]	0.2 [0.2–0.3]
<b>Latin America</b>						
2010	1 500 000 [1 200 000–1 700 000]	100 000 [73 000–140 000]	0.4 [0.3–0.5]	67 000 [45 000–92 000]	0.2 [0.1–0.4]	0.2 [0.1–0.2]
2001	1 300 000 [1 000 000–1 700 000]	99 000 [75 000–130 000]	0.4 [0.3–0.5]	83 000 [50 000–130 000]	0.2 [0.1–0.6]	0.1 [0.1–0.2]
<b>Caribbean</b>						
2010	200 000 [170 000–220 000]	12 000 [9400–17 000]	0.9 [0.8–1.0]	9000 [6900–12 000]	0.2 [0.2–0.5]	0.5 [0.3–0.7]
2001	210 000 [170 000–240 000]	19 000 [16 000–22 000]	1.0 [0.9–1.2]	18 000 [14 000–22 000]	0.4 [0.2–0.8]	0.8 [0.6–1.1]
<b>Eastern Europe and Central Asia</b>						
2010	1 500 000 [1 300 000–1 700 000]	160 000 [110 000–200 000]	0.9 [0.8–1.1]	90 000 [74 000–110 000]	0.6 [0.5–0.8]	0.5 [0.4–0.7]
2001	410 000 [340 000–490 000]	210 000 [170 000–240 000]	0.3 [0.2–0.3]	7800 [6000–11 000]	0.3 [0.2–0.3]	0.2 [0.1–0.2]
<b>Western and Central Europe</b>						
2010	840 000 [770 000–930 000]	30 000 [22 000–39 000]	0.2 [0.2–0.2]	9 900 [8 900–11 000]	0.1 [0.1–0.1]	0.1 [<0.1–0.1]
2001	630 000 [580 000–690 000]	30 000 [26 000–34 000]	0.2 [0.2–0.2]	10 000 [9 500–11 000]	0.1 [0.1–0.1]	0.1 [0.1–0.1]
<b>North America</b>						
2010	1 300 000 [1 000 000–1 900 000]	58 000 [24 000–130 000]	0.6 [0.5–0.9]	20 000 [16 000–27 000]	0.3 [0.2–0.6]	0.2 [0.1–0.4]
2001	980 000 [780 000–1 200 000]	49 000 [34 000–70 000]	0.5 [0.4–0.7]	19 000 [15 000–24 000]	0.3 [0.2–0.4]	0.2 [0.1–0.3]
<b>Total</b>						
<b>2010</b>	<b>34 000 000</b> <b>[31 600 000–35 200 000]</b>	<b>2 700 000</b> <b>[2 400 000–2 900 000]</b>	<b>0.8</b> <b>[0.8–0.8]</b>	<b>1 800 000</b> <b>[1 600 000–1 900 000]</b>	<b>0.3</b> <b>[0.3–0.3]</b>	<b>0.6</b> <b>[0.5–0.6]</b>
<b>2001</b>	<b>28 600 000</b> <b>[26 700 000–30 900 000]</b>	<b>3 100 000</b> <b>[3 000 000–3 300 000]</b>	<b>0.8</b> <b>[0.7–0.8]</b>	<b>1 900 000</b> <b>[1 700 000–2 200 000]</b>	<b>0.4</b> <b>[0.4–0.4]</b>	<b>0.8</b> <b>[0.7–0.8]</b>

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## KEY FINDINGS

### Selected health sector interventions for HIV prevention

More than 550,000 males were circumcised for HIV prevention in the priority countries of sub-Saharan Africa by the end of 2010. However, progress towards the target of expanding coverage of male circumcision to 80% of men 15 -49 years old is still very limited in most countries.

The availability and safety of blood and blood products for transfusion remain a concern. In 40 countries, less than 25% of the blood supplies comes from voluntary unpaid blood donors; in low-income countries with available data, only 53% of blood donations were screened in a quality-assured manner in 2008.

The global burden of sexually transmitted infections remains high in most regions of the world. Early identification and treatment of sexually transmitted infections are important elements in a comprehensive and effective HIV response. New rapid syphilis tests provide an opportunity to scale up syphilis screening in many settings in which traditional tests were unavailable.

In 2010 and 2011, landmark studies were published strengthening the evidence base on the preventive effects of antiretroviral drugs. People living with HIV receiving antiretroviral therapy are less likely to transmit HIV, and HIV-negative people who take antiretroviral pre-exposure prophylaxis orally in tablet form or topically in a vaginal gel reduce their risk of acquiring HIV.

### 3.1 Overview and challenges

Thirty years after AIDS was first reported, HIV continues to spread. Although 2010 estimates suggest that the annual number of people newly infected with HIV has declined 20% from the global epidemic peak in 1998, an estimated 2.7 million people acquired the virus in 2010 alone (see Chapter 2). Existing prevention efforts, although improving, are often insufficiently comprehensive or inadequately tailored to local epidemics. This requires stronger country surveillance systems, especially among key populations at higher risk of HIV infection, greater political commitment to implementing evidence-informed programmes and the development of new prevention approaches and improved tools to strengthen national responses and accelerate progress towards achieving the Millennium Development Goals.

#### 3.1.1 Understanding the characteristics of the epidemic to inform prevention programmes

The selection of which HIV prevention programme components to deploy for which priority populations must be based on a clear understanding and mapping of the national epidemiology of HIV – who is acquiring HIV, where, how and why – to design the appropriate mix of prevention programmes. To successfully limit transmission, effective prevention services must reach the areas and populations where HIV is spreading most rapidly. Achieving population-level impact requires that programmes be implemented at the necessary scale and intensity (1).

Moreover, many countries have in fact mixed epidemics, with important in-country variation in HIV incidence and subpopulations at higher risk for HIV infection. Effective prevention policies must adequately account for local differences in HIV transmission dynamics.

#### 3.1.2 Promoting combination HIV prevention

Experience from successful programmes suggests that a mix of components tailored for different populations and implemented in different settings is the most effective approach to reduce HIV transmission (2). Certain elements of a comprehensive prevention strategy are often implemented while ignoring others, diminishing their overall impact on HIV incidence. Countries need to determine their prevention priorities,

combining biomedical with behavioural and structural interventions relevant to their epidemic.<sup>1</sup>

Critical enablers must be assessed and strengthened to remove social and programmatic barriers that hinder the implementation or effectiveness of prevention programmes. This entails incorporating complementary strategies to make environments more conducive to the uptake of HIV prevention programmes and to help improve the overall performance of service delivery.<sup>2</sup>

New data from biomedical HIV prevention studies published in 2010 and 2011 have expanded the set of available prevention interventions, shedding light on the effectiveness and potential impact of new strategies (4–6). It is now necessary to develop approaches that can successfully integrate these novel biomedical interventions into prevention packages and existing services and systems.

This chapter describes progress made in 2010 in scaling up select interventions for HIV prevention related to the health sector (male circumcision, blood safety and preventing sexually transmitted infections). It also discusses the role of antiretroviral therapy and key emerging approaches for HIV prevention, such as pre-exposure prophylaxis and the use of antiretroviral therapy for HIV prevention. Chapter 6 discusses prevention programmes for key populations at higher risk of HIV infection, particularly sex workers, men

1 HIV prevention includes:

- HIV testing and counselling, including testing and counselling of couples;
  - preventing sexual transmission, including promoting male and female condoms, screening and managing sexually transmitted infections, voluntary medical male circumcision focusing on adult men in settings with a high prevalence of HIV infection, non-occupational antiretroviral post-exposure prophylaxis, antiretroviral pre-exposure prophylaxis (taken by HIV-negative people to prevent them from acquiring HIV infection) and antiretroviral therapy for prevention (taken by people living with HIV);
  - preventing transmission among people who inject drugs, including the comprehensive set of nine harm reduction strategies; and
  - preventing HIV in health care settings, including blood and injection safety and occupational antiretroviral post-exposure prophylaxis.
- These components differ in their direct individual- and population-level effect and effects on reducing the number of people newly infected with HIV.

2 Social enablers consist of outreach for HIV testing and HIV treatment literacy, stigma reduction, advocacy to protect human rights, monitoring the equity and quality of programme access and results and mass communication designed to raise awareness and support change in social norms. Programme enablers include incentives for programme participation, methods to improve the retention of people receiving antiretroviral therapy, building capacity for developing community-based organizations, strategic planning, communication infrastructure, disseminating information and efforts to improve service integration and links from testing to care (3).

### Box 3.1

#### Preventing HIV among young people

People aged 15–24 years are at the forefront of the epidemic. Five (5.0) million [4.3–6.5 million] of these young women and men were living with HIV as of December 2010. Young women are especially vulnerable to HIV, and they disproportionately account for 64% [60–83%] of the young people living with HIV worldwide. In most epidemic contexts, but especially in those in which HIV is concentrated in certain subpopulations, prevention efforts must also focus on young people who inject drugs, young sex workers and young men who have sex with men, since they have a higher risk of HIV exposure and infection.

A comprehensive and yet tailored package of programme components is needed to engage young people and address their specific circumstances and needs. These include increasing the availability of condoms and effectively promoting their correct and consistent use; implementing evidence-informed, skills-based comprehensive sexuality education; scaling up mass media programmes to influence and change harmful social and cultural norms; providing youth-friendly health services; and mobilizing and engaging young people in designing, implementing, monitoring and evaluating HIV programmes.

Despite improved surveillance systems, data collected by UNAIDS and WHO indicate that most countries are still unable to provide epidemiological or programmatic data specific to young people. Few countries report national indicators by age and sex, and although some countries report on programmes for key populations at higher risk, there is often little information on young people within these populations. Greater investment is needed both nationally and internationally to identify programmatic gaps and design and implement adequate policies.

who have sex with men and injecting drug users. Chapter 7 considers the prevention of mother-to-child transmission of HIV, including primary prevention of HIV infection among women of childbearing age, family planning to prevent unplanned pregnancies, antiretroviral prophylaxis and antiretroviral therapy to keep mothers alive.

## 3.2 Selected HIV prevention interventions in the health sector

### 3.2.1 Male circumcision in countries in sub-Saharan Africa with a high burden of HIV

Three randomized clinical trials conducted in sub-Saharan Africa to study the efficacy of voluntary medical male circumcision for preventing HIV acquisition among heterosexual HIV-negative men showed a strong protective effect, with an approximate 60% reduction in the risk of acquiring HIV (7–9). A

population-based study in a South African township has also shown reduced HIV prevalence and incidence at the community level three years after male circumcision services began to be rolled out (Box 3.2) (10).

In 2007, WHO and UNAIDS recommended including male circumcision as an additional HIV prevention programme component in settings with high HIV prevalence and low levels of male circumcision. Thirteen countries were identified as priority areas for scaling up voluntary medical male circumcision based on their epidemiological profiles and prevalence of male circumcision (11).

It has been estimated that expanding the coverage of voluntary medical male circumcision to 80% of 15 to 49 year old men within five years could avoid around 3.5 million people becoming newly infected with HIV in eastern and southern Africa, representing cost savings of about US\$ 16.6 billion between 2011 and 2025 (12). Recent studies have also noted indirect or potential benefits of male circumcision for women, who may be less exposed to HIV infection because the HIV prevalence among men is reduced. One modelling study suggested that male circumcision has the potential to reduce, in the long term, the rate of heterosexual transmission from males to females by 46% (13). Further, the female partners of circumcised HIV-negative men had a lower prevalence of high-risk

### Box 3.2

#### Community-level impact of male circumcision in Orange Farm, South Africa

Despite the strong protective effects of male circumcision, replicated in three large randomized controlled trials, limited evidence exists on how scaling up voluntary medical male circumcision services affects the population-level incidence and prevalence of HIV infection. However, a recently published study conducted in Orange Farm, a community comprising 110 000 adults in South Africa, has shown that the preventive benefits of male circumcision among men can also be observed at the community level.

The cross sectional study was conducted in 2007–2008 among 1198 men 15–49 years. Circumcision status was self reported and clinically assessed. Men without foreskins had a 65% lower HIV incidence (adjusted incidence rate ratio = 0.35) and 55% lower prevalence than men with foreskins (adjusted prevalence rate ratio = 0.45). There were no differences between men in terms of sexual behaviour, and most, although not all, were aware that circumcised men could become HIV infected.

Source: Lissouba et al. (10).

**Table 3.1** Number of males circumcised for HIV prevention during 2008–2010 and estimated number of male circumcisions needed to reach 80% coverage among 15–49 year old men in priority countries of eastern and southern Africa

Countries	Number of male circumcisions done by calendar year				Estimated number of male circumcisions needed to reach 80% coverage among males 15–49 years old
	2008	2009	2010	Total	
Botswana	0	5424	5773	11 197	345 244
Ethiopia (province of Gambella)	0	769	2689	3458	40 000
Kenya	11 663	80 719	139 905 <sup>a</sup>	232 287 <sup>a</sup>	860 000*
Lesotho <sup>b</sup>	0	0	Unknown <sup>b</sup>	Unknown <sup>b</sup>	376 795
Malawi	589 <sup>c</sup>	1234 <sup>c</sup>	1296 <sup>c</sup>	3119 <sup>c</sup>	2 101 566
Mozambique	0	100	7633	7733	1 059 104
Namibia	0	224	1763	1987	330 218
Rwanda	0	0	1694	1694	1 746 052
South Africa	5190 <sup>d</sup>	9168 <sup>d</sup>	131 117 <sup>d</sup>	145 475 <sup>d</sup>	4 333 134
Swaziland	1110	4336	18 869	24 315	183 450
United Republic of Tanzania	0	1033	18 026 <sup>e</sup>	19 059 <sup>e</sup>	1 373 271
Uganda	0	0	9052	9052	4 245 184
Zambia	2758	17 180	61 911	81 849	1 949 292
Zimbabwe	0	2801	11 176	13 977	1 912 595
<b>Total</b>	<b>21 310</b>	<b>122 988</b>	<b>410 904</b>	<b>555 202</b>	<b>20 855 905</b>

\* Kenya's goal is: to increase the proportion of men aged 15–49 years who are circumcised in Kenya from 84 to 94% by 2013; the number of male circumcisions needed to achieve this national goal are in the table. Source: Kenya National Strategy for Voluntary medical Male Circumcision, October 2009, Republic of Kenya Ministry of Public Health and Sanitation.

Data sources: PEPFAR Male Circumcision Technical Working Group (unpublished data) unless otherwise indicated.

a National AIDS & STI Control Programme of Kenya.

b Ministry of Health of Lesotho.

c Ministry of Health of Malawi.

d National Department of Health of South Africa.

e Ministry of Health of the United Republic of Tanzania.

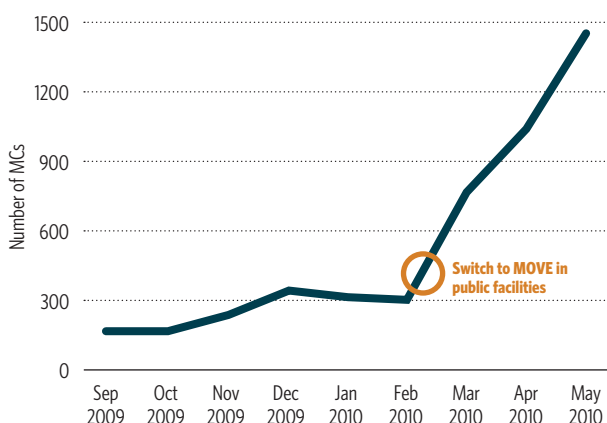
human papillomavirus than did the female partners of uncircumcised men, a pattern that may lead to a reduction in cervical cancer among women whose partners are circumcised in addition to a lower incidence of penile cancer (14).

By the end of 2010, most of the priority countries in Eastern and Southern Africa had put in place the key programmatic elements to support the roll-out of male circumcision programmes. More than 550 000 males

were reported to be circumcised for HIV prevention between 2008 and 2010 in the 13 priority countries of Eastern and Southern Africa and in the Ethiopian province of Gambella, and 77% were performed in 2010 (Table 3.1).<sup>1</sup> Kenya, South Africa and Zambia performed the largest absolute numbers of male circumcisions in 2010.

Countries have relied on various modes of service delivery to accelerate the scaling up of male circumcision. These include stand-alone clinics, routine facility-based services into which the male circumcision package of interventions is integrated and outreach and mobile services. Implementing efficiency measures that allow for more procedures to be performed in a safe but less time-consuming manner, such as the MOVE<sup>2</sup> (models for optimizing volume and efficiency) framework, has also contributed to expanding male circumcision services (15). In the United Republic of Tanzania, the number of males circumcised increased three-fold after the MOVE approach was adopted (Fig. 3.1).

**Fig. 3.1** Numbers of males circumcised, United Republic of Tanzania, September 2009 to May 2010



Source: Ministry of Health, United Republic of Tanzania, 2010.

1 UNAIDS and WHO identified 13 priority countries in 2007, based on the prevalence of HIV infection and male circumcision. The United States President's Emergency Plan for AIDS Relief in addition to these 13 countries is supporting Gambella province of Ethiopia.

2 MOVE includes three categories of approaches such as simplified safe circumcision techniques, task-sharing and task-shifting.

### Box 3.3

#### Expanding and integrating male circumcision for HIV prevention in Zambia

In 2007, Zambia's HIV prevalence was 14.3% and the male circumcision rate was 12.8% (18). Zambia's target for male circumcision for 2010 was 100 000, of which about 62 000 were performed, bringing the cumulative number of males circumcised in the country to 81 849 as of December 2010. High-level commitment has been sustained, and the Ministry of Health has established mechanisms to coordinate the programme for scaling up male circumcision with the various partners involved. Tasks have been shifted to nurses, midwives and clinical officers to expand services.

Zambia uses a multisectoral approach involving the defence forces, police and prison services as well as the private sector. Service delivery options include static, outreach and mobile sites in public and private facilities. Safe male circumcision interventions are integrated into sexually transmitted infection and HIV programming to optimize the available resources. These services are further linked to other appropriate interventions, including antiretroviral therapy. In parallel to the catch-up phase with adolescents and adult men, Zambia has commenced neonatal circumcision in three sites.

Important progress has been made in expanding access to and uptake of voluntary medical male circumcision for HIV prevention, but the gap to reach 80% coverage is still considerable. Cultural influences and beliefs, including those linked with traditional male circumcision, as well as insufficiently robust commodity management systems, have been identified as challenges for accelerating scale-up.

However, progress towards the target of expanding coverage of male circumcision to 80% of men 15–49 years old is still very limited in most. Greater efforts are thus needed to overcome challenges, accelerate programme implementation, and ultimately affect population-level prevention (Box 3.3) (16). Research is underway on innovative technologies including non-surgical devices that may address some challenges.

All priority countries have adopted the minimum package of male circumcision services recommended by WHO and UNAIDS, including management of sexually transmitted infections, HIV testing and counselling, condom promotion and safer sex education. In 2010, the reported uptake of HIV testing and counselling ranged between 56% and 98% among men receiving male circumcision across all priority countries, demonstrating how male circumcision services can be leveraged as an important entry point to provide men with an opportunity to learn their HIV serostatus (17).

### 3.2.2 Preventing and managing sexually transmitted infections

Rapidly identifying and treating sexually transmitted infections are important elements in controlling HIV, since sexually transmitted infections synergistically increase the risk of HIV transmission (19). Substantial evidence suggests that sexually transmitted infections increase HIV shedding in the genital tract of people living with HIV, thereby boosting infectiousness, and disrupt mucosal barriers, leading to increased susceptibility to acquiring HIV infection among HIV-negative individuals.

Various interventions for controlling sexually transmitted infections have proven effective, including syndromic management of genital ulcer disease and urethral discharge, syphilis testing of pregnant women and individuals diagnosed with other sexually transmitted infections, treating the male partners of people with trichomoniasis, counselling about risk reduction related to HIV and sexually transmitted infections, human papillomavirus vaccination and treating the partners of people with gonococcal, chlamydial and syphilis infections.

New rapid syphilis tests have provided an opportunity to scale up syphilis screening in many settings in which traditional tests were unavailable (20). Recent evidence suggests that tenofovir gel, a vaginal microbicide, shows promise as an intervention to prevent not only HIV infection but also herpes simplex virus-2 infection among women (21).

Where implemented widely, these interventions have resulted in a decline in the prevalence of sexually transmitted infections such as chancroid, syphilis, gonorrhoea and genital warts as well as long-term consequences such as infertility, congenital syphilis and cervical cancer in many parts of the world. Controlling sexually transmitted infections may have also contributed to the gradual decline in HIV prevalence in several low- and middle-income countries (22). Unfortunately, however, the global burden of sexually transmitted infections remains high in most regions of the world (Box 3.4) (23).

Services for sexually transmitted infections are a critical component of comprehensive HIV prevention and reproductive health programmes. In addition to addressing issues specific to sexually transmitted infections, they provide an opportunity to offer



provider-initiated testing and counselling for HIV and can serve as entry points for HIV care and treatment interventions. Data on sexually transmitted infections can also assist in interpreting HIV epidemiological risk factors. For example, changes in syphilis prevalence among antenatal care attendees can provide an early warning of changes in risk behaviour associated

with HIV transmission in the general population or assist in interpreting HIV epidemiological risk factors (Box 3.5). Acute sexually transmitted infections such as gonorrhoea and primary and secondary syphilis also serve as biomarkers of HIV and the effectiveness of programmes to prevent sexually transmitted infections. Although broad-based services are well

### Box 3.4

#### Global estimates of incidence and prevalence of selected sexually transmitted infections: *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Treponema pallidum* (syphilis) and *Trichomonas vaginalis*

In 2008, there were 498 million new cases of sexually transmitted infection globally: 106 million new cases of *Chlamydia trachomatis*, 106 million new cases of *Neisseria gonorrhoeae*, 10 million new cases of syphilis and 276 million new cases of *Trichomonas vaginalis*. These estimates are similar to the values seen in 2005, when the total number of new cases of these four sexually transmitted infections was estimated to be 448 million using comparable methods (Table 3.2).

**Table 3.2** Number of new cases of infection in millions among adult men and women 15–49 years old, 2008<sup>a</sup>

WHO region	<i>Chlamydia trachomatis</i>	<i>Neisseria gonorrhoeae</i>	<i>Treponema pallidum</i> (syphilis)	<i>Trichomonas vaginalis</i>	Total
African Region	8.3	21.1	3.4	59.7	92.6
Region of the Americas	26.4	11.0	2.8	85.4	125.7
Eastern Mediterranean Region	3.2	3.1	0.0	20.2	26.4
European Region	20.6	3.4	0.2	22.6	46.8
South-East Asia Region	7.2	25.4	3.0	42.9	78.5
Western Pacific Region	40.0	42.0	0.5	45.7	128.2
<b>Total</b>	<b>106</b>	<b>106</b>	<b>10</b>	<b>276</b>	<b>498</b>

a See Annex 10 for a complete list of countries by WHO regions.

These infections, however, are only 4 of the more than 30 infections that can be transmitted sexually. Although these estimates are based on limited data from surveillance and special studies, they indicate that the global burden of sexually transmitted infections remains high. Improved and more accurate estimates require collecting higher-quality data on sexually transmitted infections at the country and regional levels.

### Box 3.5

#### Differences in the prevalence of HIV and syphilis among pregnant women in urban and rural areas in Ethiopia

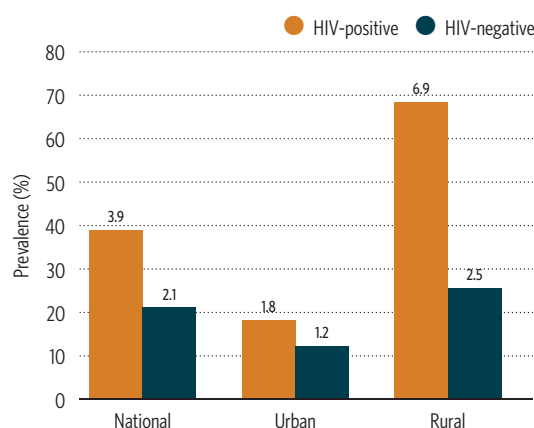
In 2009, Ethiopia conducted an unlinked anonymous antenatal care sentinel HIV survey in which HIV testing was performed on leftover blood collected for routine syphilis rapid plasma reagin testing. The survey was conducted in 114 sentinel sites: 73 rural and 41 urban.

Among 43 036 specimens, the national prevalence of syphilis was 2.3%: 2.6% in rural sites and 1.7% in urban sites. People living with HIV were twice as likely to be positive for syphilis (3.9%) than HIV-negative people (2.1%). People living with HIV in rural areas had a higher prevalence of syphilis (6.9%) than those in urban areas (1.8%) (Fig. 3.2).

Ethiopia's Federal Ministry of Health concluded that the prevalence of syphilis observed requires strengthening services for sexually transmitted infections throughout the country, especially in rural areas. In addition, routine syphilis screening and treatment should also be available at all antenatal care clinics throughout the year.

Source: Report on the 2009 round antenatal care sentinel HIV surveillance in Ethiopia (24).

**Fig. 3.2** Prevalence of syphilis (%) in a sentinel survey in Ethiopia by HIV serostatus and site setting, 2009



suited to address general population needs, in areas with high levels of stigma or legal barriers, dedicated services for populations at higher risk of HIV infection, such as sex workers and men who have sex with men, may be necessary to engage these populations and ensure adequate access to tailored health programmes. Chapter 6 reviews the prevalence of sexually transmitted infections among sex workers and men who have sex with men. Similarly, Chapter 7 discusses the prevalence of sexually transmitted infections and access to interventions for pregnant women.

### 3.2.3 Safety of blood supplies

An estimated 92 million units of blood are donated globally each year.<sup>1</sup> About half are collected in high-income countries and half in low- and middle-income countries. Although important progress has been made in the past decade in improving safe blood supply worldwide, the availability and safety of blood supplies for transfusion remain issues of concern in multiple settings, especially in low-income countries. A shortage of safe blood may lead to the collection of blood from unsafe replacement or paid donors or to blood being transfused without testing, thus contributing to an increased risk of transfusion-transmitted HIV and hepatitis. Reducing the incidence of HIV infection caused by unsafe blood transfusion requires implementing an integrated strategy led by a nationally

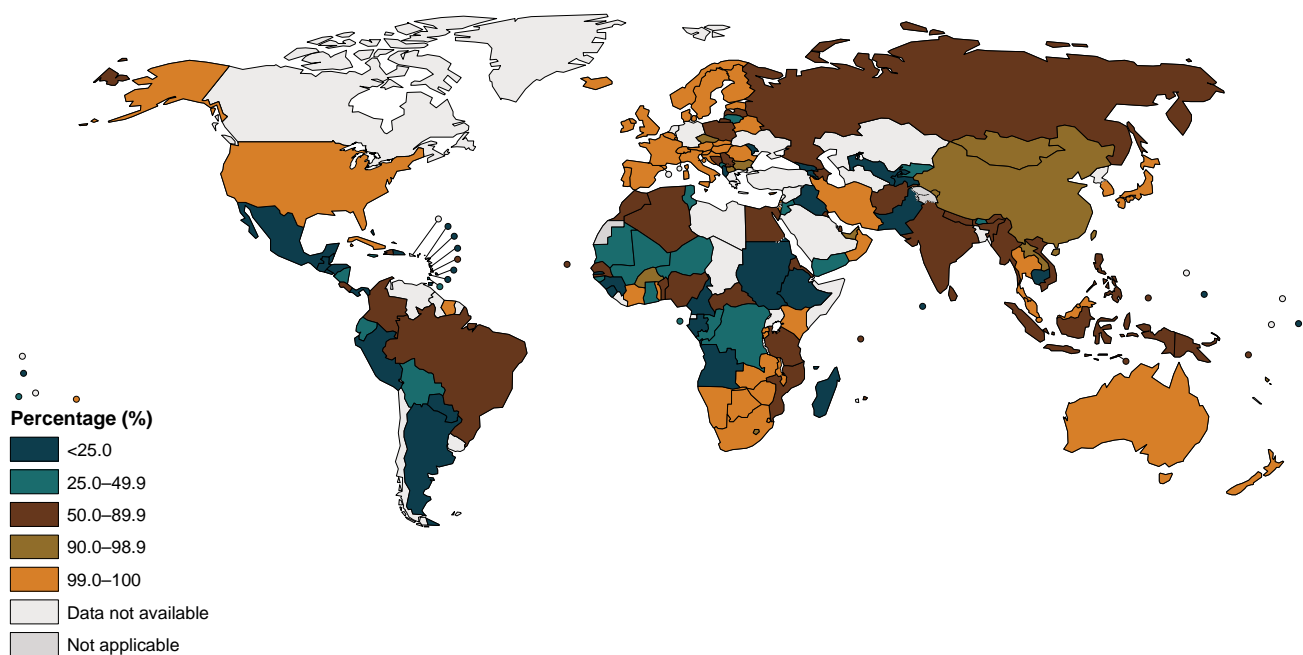
coordinated blood transfusion service, collecting blood from voluntary, unpaid donors; screening all donated blood for transfusion-transmissible infections such as HIV; and ensuring adequate training of clinicians on rational blood use.

The generally accepted minimum rate of blood donation required to meet a country's most basic requirements for blood is estimated to be 10 units per 1000 population per year. Blood donation rates are 13 times higher in high-income countries than in low-income countries. The median blood donation rate in high-income countries is 36.4 units per 1000 population (range 13.3–64.6), 11.6 (range 1.6–36.2) in middle-income countries, and 2.8 (range 0.4–8.2) in low-income countries (26).

In 2008, 70 countries (including 21 low-income and 41 middle-income countries) reported an increase in voluntary unpaid blood donations exceeding 10% compared with 2007. Conversely, 23 low- and middle-income countries reported a year-on-year decline in voluntary unpaid blood donation exceeding 10%. Among the 164 countries reporting data in 2008, 40 collected less than 25% of their blood supplies from voluntary unpaid blood donors, and much of the blood supply in these countries still depended on family or replacement and paid blood donors (Fig. 3.3).

<sup>1</sup> Based on 2008 data from the Global Database on Blood Safety (25) as reported by 164 Member States directly to WHO.

**Fig. 3.3** Percentage of blood donated that is voluntary and unpaid, 2008



Source: WHO Global Database on Blood Safety [online database] (25).

**Table 3.3** Global situation of donated blood screened in a quality-assured manner

Income group (number of countries reporting)	Total number of units donated	% of units screened for HIV in a quality-assured manner	Number of units not screened in a quality-assured manner
High-income ( <i>n</i> = 34)	27 541 000	99.7%	74 000
Middle-income ( <i>n</i> = 47)	13 041 000	83.6%	2 133 000
Lower-income ( <i>n</i> = 24)	1 642 000	53.4%	765 000
<b>Total (<i>n</i> = 105)</b>	<b>42 224 000</b>	<b>92.9%</b>	<b>2 972 000</b>

Source: WHO Global Database on Blood Safety [online database] (25).

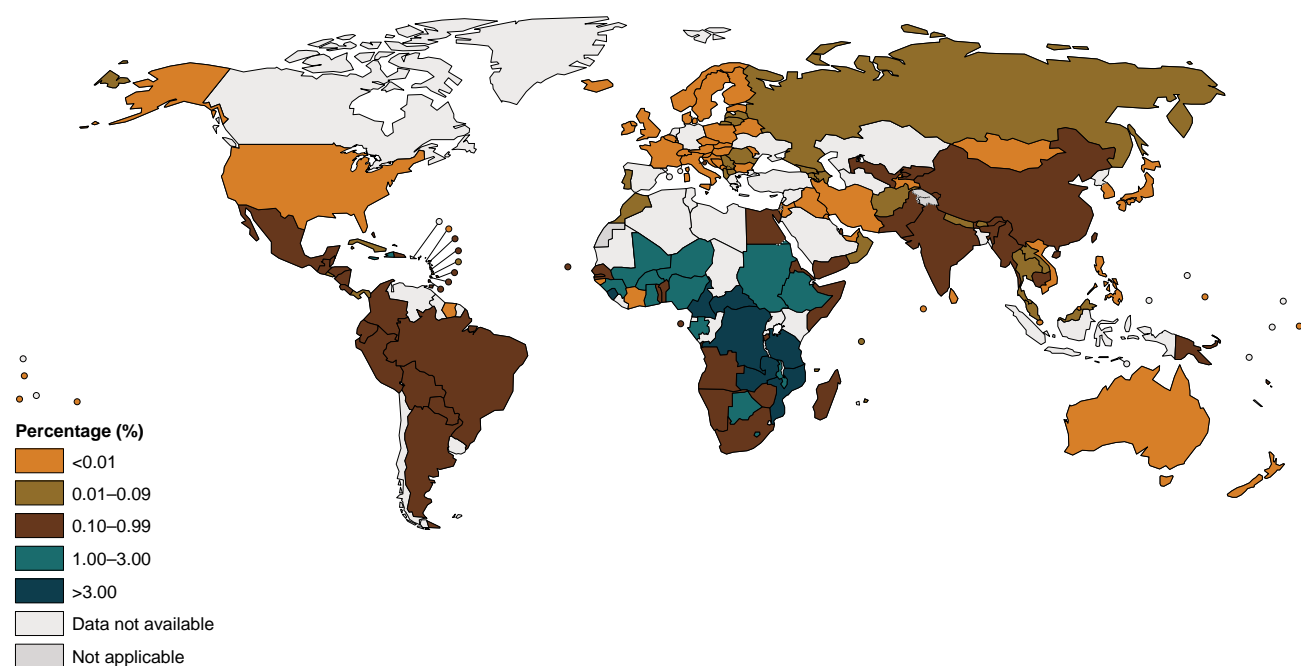
To protect the safety of blood supplies, blood donations should be screened in a quality-assured manner<sup>1</sup>, which includes using standard operating procedures and participating in an external quality assessment scheme. Data provided by 105 countries<sup>2</sup> on the percentage of blood supplies screened in a quality-assured manner in 2008 continue to show an important gap among

- 1 For the purposes of data collection, screening in a quality-assured manner is defined as screening performed in blood centres or blood screening laboratories that (1) follow documented standard operating procedures and (2) participate in an external quality assurance scheme (27).
- 2 Including 2008 data from WHO's Global Database on Blood Safety (25) for 97 countries and data collected through the UNAIDS 2009 UNGASS reporting process for Algeria, Bulgaria, Cyprus, Japan, Monaco, Saudi Arabia, Spain and Tunisia.

countries: 99.7% of donations in high-income countries and 83.6% in middle-income countries were screened following these quality procedures, but in low-income countries the comparable figure was markedly lower, at 53.4%. It is estimated that at least 2.97 million donations – 2.90 million of which are in low- and middle-income countries – are not screened in accordance with quality assurance procedures (Table 3.3).

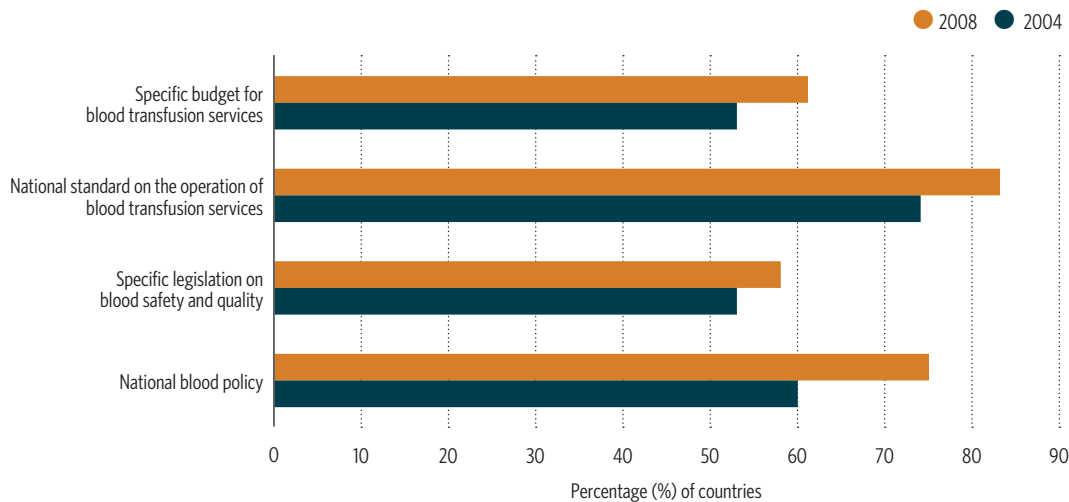
In addition, of 164 countries that provided data on screening for transfusion-transmissible infections – including HIV, hepatitis B, hepatitis C and syphilis – 5 high-income, 21 middle-income and 13 low-income countries reported being unable to screen all donated blood for one or more of these infections. Irregular supply of test kits is one of the most commonly reported barriers that prevent many low- and middle-income countries from screening all the blood they collect. One third of the 98 low- and middle-income countries reporting indicated that test kits for screening transfusion-transmissible infections were out of stock at some point during the 12-month reporting period. This is particularly concerning, since the prevalence rate of HIV in blood donations remains elevated in many low- and middle-income countries (Fig. 3.4). The difference reflects the variable prevalence among members of the population who are eligible to donate

**Fig. 3.4** Prevalence of HIV in donated blood by country (% positive or reactive for HIV), 2008



Source: WHO Global Database on Blood Safety [online database] (25).

**Fig. 3.5 Percentage of countries reporting selected policy or mechanisms for developing nationally coordinated blood transfusion services, 2004 and 2008**



Source: WHO Global Database on Blood Safety [online database] (25).

blood, the type of donors (such as voluntary unpaid blood donors from populations at lower risk) and the effectiveness of the system of educating and selecting blood donors.

WHO recommends that all activities related to blood collection, testing, processing, storage and distribution be coordinated at the national level through effective organization and a national blood policy supported by appropriate legislation to promote uniform implementation of standards and consistency in the quality and safety of blood and blood products (28). Since 2004, more countries have been able to develop and adopt key elements of nationally coordinated blood transfusion services (Fig. 3.5).

Although trends have generally been positive in the past 10 years, blood transfusion safety is still a concern, especially in low- and middle-income countries, where the prevalence of transfusion-transmissible infections among blood donors is high, blood shortages are common, dependence on family or replacement and paid donations is commonplace and the quality and coverage of blood screening is inadequate. It is important to scale up ongoing efforts to strengthen national blood systems and ensure sufficient and safe blood supplies worldwide, especially in the low- and middle-income countries.

### 3.2.4 New HIV prevention technologies

#### 3.2.4.1 Topical and oral antiretroviral pre-exposure prophylaxis to prevent HIV-negative individuals from acquiring HIV infection

The scientific base underpinning the use of antiretroviral drugs to prevent HIV acquisition in uninfected individuals has considerably evolved in 2010 and 2011 with the publication of groundbreaking results from several clinical trials.

In July 2010, the first trial to report on the use of a topical tenofovir-containing gel to prevent HIV acquisition in women reported an overall 39% effectiveness, with substantially better results among those who used the gel with greater consistency (21). In November 2010, the iPrEx trial (29), a multinational trial of daily oral tenofovir/emtricitabine tablets among men who have sex with men, showed that pre-exposure prophylaxis (PrEP) was 44% effective in preventing HIV transmission, with even stronger results among those who took the drug as prescribed. Importantly, this trial established the proof of concept of oral pre-exposure prophylaxis among men who have sex with men.

In April 2011 the FEM-PrEP trial, which assessed the effectiveness of oral tenofovir plus emtricitabine

**Table 3.4 Summary of recently published studies on topical and oral pre-exposure prophylaxis**

Study name	Type and antiretroviral agents used	Study population	Date results release	Study results
CAPRISA 004 (27)	Pre-exposure prophylaxis - vaginal tenofovir gel 1%	Women	July 2010	39% overall decrease in HIV acquisition
iPrex (29)	Pre-exposure prophylaxis - oral tenofovir plus emtricitabine	Men who have sex with men	November 2010	44% overall decrease in HIV acquisition and 79% decrease in high- adherence group
FEM-PrEP (30)	Pre-exposure prophylaxis - emtricitabine and tenofovir	Women	April 2011	Discontinued because of a lack of statistically significant difference
Partners PrEP (31)	Pre-exposure prophylaxis - oral tenofovir	Serodiscordant couples	July 2011	62% decrease in HIV acquisition
	Pre-exposure prophylaxis - oral tenofovir plus emtricitabine	Serodiscordant couples	July 2011	73% decrease in HIV acquisition
TDF2 (32)	Pre-exposure prophylaxis - oral tenofovir plus emtricitabine	HIV-negative heterosexual men and women	July 2011	63% decrease in HIV acquisition

tablets among women in Kenya, South Africa and the United Republic of Tanzania, was discontinued when an interim analysis revealed that the trial would not be able to find a difference in risk reduction, if one existed, between the treatment and the placebo arms (30). Subsequently, two trials among heterosexual men and women reported encouraging results. Partners PrEP, a trial among serodiscordant couples (couples in which only one partner is living with HIV) in Kenya and Uganda, compared two oral pre-exposure prophylaxis formulations, tenofovir alone and tenofovir plus emtricitabine, with a placebo control. In this trial, a 62% reduction in the risk of HIV acquisition was found among those taking tenofovir tablets and a 73% decline in the group taking the combination tablets (31). The trial was stopped early on interim review because of the evident effectiveness of pre-exposure prophylaxis. TDF2, a smaller study among heterosexual men and women in Botswana, reported similar results, with the combination tenofovir plus emtricitabine tablet reducing the risk of acquiring HIV infection by 63% overall (32).

WHO and the UNAIDS Secretariat, with support from the Bill & Melinda Gates Foundation, have been working during the past two years to plan for eventually implementing and scaling up pre-exposure prophylaxis once the evidence base is sufficiently strong. In that effort, consultations have been held in eight countries where pre-exposure prophylaxis research has been planned or conducted (Brazil, Ecuador, Kenya, Peru, Thailand, United Republic of Tanzania, Zambia, and Zimbabwe). In addition, five regional consultations, held in Dakar, Nairobi, Brasilia, Johannesburg and

Bangkok, have brought together countries with first-hand experience of pre-exposure prophylaxis trials and those for which it is a new topic. As a result, dialogue about and planning for implementing pre-exposure prophylaxis has begun in some countries. Initial efforts remain largely exploratory, as the appropriate populations, the best delivery points and the safest and most effective delivery methods still need to be identified through implementation research. Informed by further scientific developments and outcomes from implementation research, guidelines for oral pre-exposure prophylaxis will be developed (Table 3.4).

#### 3.2.4.2 Antiretroviral therapy for prevention among people living with HIV

A strong scientific evidence base has also emerged in recent years showing that antiretroviral therapy, by lowering a person's viral load and restoring the immune system, significantly reduces HIV transmission and the incidence of TB.

The almost complete elimination of HIV infection among children in high-income countries by the appropriate administration of antiretroviral prophylaxis to pregnant women had long provided evidence of the substantial effect of antiretroviral therapy in preventing mother-to-child HIV transmission. Theoretical models also suggested that antiretroviral therapy could decrease HIV incidence and mortality, and a 2009 meta-analysis including 11 cohorts (5021 heterosexual couples) found a nearly zero risk of sexual transmission among people receiving antiretroviral therapy and with viral load below 400 copies per ml (33–37).

However, the publication of results from the landmark HPTN 052 study in 2011 considerably strengthened the available evidence base, since it was the first multinational randomized controlled trial to demonstrate a significant reduction in HIV transmission in serodiscordant couples from antiretroviral therapy (Box 3.6). A recent systematic review further confirmed the role of antiretroviral therapy in HIV prevention in serodiscordant couples in which the partner living with HIV had CD4 cell counts below 550 cells/mm<sup>3</sup> (38).

Moreover, the impact of antiretroviral therapy on community-level HIV transmission is being increasingly documented. In British Columbia, a decrease in community plasma HIV RNA concentrations and HIV incidence among people who inject drugs was associated with the use of antiretroviral therapy (40). Between 2004 and 2008, the number of people newly diagnosed with HIV infection in San Francisco fell by 45%, the average viral load among the people living with HIV fell by 40% and the actual incidence of people becoming newly infected with HIV fell by one third between 2006 and 2008. In the Chinese province of Taiwan, a 53% reduction in new HIV cases was associated with free access to antiretroviral therapy (41).

WHO, UNAIDS and partners are currently engaged in further research to better understand how antiretroviral therapy affects TB, the relative importance of drug resistance and other assumptions on overall therapy outcomes, the effects of combining pre-exposure

### Box 3.6

#### The HPTN 052 study

Started in 2005, the HPTN 052 trial followed serodiscordant couples in Botswana, Brazil, India, Malawi, South Africa, Thailand and Zimbabwe (39). The study had two arms - one in which the partner living with HIV in a serodiscordant couple received antiretroviral therapy immediately if his or her CD4 cell count fell below 550 cells/mm<sup>3</sup> and the other, the delayed arm, in which partners did not receive antiretroviral therapy until they met the prevailing eligibility criteria of having CD4 cell counts at or below 250 cells/mm<sup>3</sup>. All participants received ongoing couples counselling and condoms.

The study found that providing immediate antiretroviral therapy to the partner living with HIV was associated with a 96% reduction in the likelihood of HIV transmission among serodiscordant couples. As of 21 February 2011, HIV-1 had been transmitted to 39 partners. Of these, 28 were virologically linked to the partner living with HIV, and only one occurred in the group getting early antiretroviral therapy. Although the probability of death did not differ significantly between the two arms, HIV-related clinical events declined by 41% in the subgroup that received immediate antiretroviral therapy.

prophylaxis and antiretroviral therapy, the economic costs and benefits of the various strategies and the effectiveness of various models of providing testing and counselling. As more scientific evidence becomes available, WHO will assess its implications for the strategic use of antiretroviral drugs in HIV prevention and its repercussions for the development of technical guidelines for countries.

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# KEY FINDINGS

## 4

### Knowledge of HIV status

*The number of facilities providing HIV testing and counselling continued to increase.* The reported number of health facilities providing HIV testing and counselling services reached 131 000 in 2010 (119 countries), from 107 000 in 2009 (118 countries), 78 000 in 2008 (111 countries) and 30 300 in 2007 (78 countries). In a subset of 104 countries reporting data in both 2009 and in 2010, the median number of facilities per 100 000 population increased from 5.7 to 8.2 (44%).

*The number of HIV tests increased globally.* In a subset of 87 countries providing data in both 2009 and 2010, about 72 million HIV tests were performed, an increase from the 64 million tests performed in 2009; the median number of tests per 1000 adult population rose from 47 to 55, a 17% gain.

Population-based surveys conducted in selected low-income countries in sub-Saharan Africa show that 1) the proportion of people who report having ever had an HIV test is higher among women than men and 2) knowledge of HIV status, although increasing, remains broadly inadequate. In six countries with results from population-based surveys conducted in 2007-2009, a large proportion of respondents was not aware of their HIV seropositivity before the survey, from about 30% in Kenya to close to 70% in the Congo.

Available data indicate that extensive attrition exists between HIV testing and counselling and treatment, care and support services. Greater attention is needed to implement service delivery models that reflect local needs and can strengthen links between HIV testing and counselling and other services, including prevention, treatment, care and support interventions.

## 4.1 Overview of progress and key challenges

As a critical gateway to services, HIV testing and counselling are essential in expanding access to HIV prevention and treatment and ultimately achieving universal access. Facility-level data and population-based surveys show that both the availability and uptake of HIV testing have increased considerably across low- and middle-income countries in recent years. Most countries have now adopted client- and provider-initiated testing and counselling policies, which have decisively contributed to raising awareness of HIV status in the general population and among key populations at higher risk of HIV infection and transmission (1).

Nevertheless, the widespread increase in HIV testing and counselling availability and uptake across diverse settings has highlighted several key programmatic gaps that must be tackled to maximize the population-level benefits of testing and counselling services for scaling up HIV prevention and treatment. First, available data show that, in generalized epidemics, a large proportion of people with HIV are still unaware of their HIV status and that, in low and concentrated epidemics, despite high levels of testing in some contexts, such as antenatal care clinics, key populations at higher risk of HIV infection are often not reached. Greater efforts are needed to ensure that HIV testing and counselling adequately reach the population groups at higher risk of

HIV infection, for whom timely knowledge of HIV status is essential to implement prevention interventions and avoid late initiation of antiretroviral therapy.

Moreover, recent evidence indicates that extensive attrition takes place between HIV testing and counselling and treatment, care and support services. In many circumstances, people informed of their HIV-positive status are not adequately linked with the appropriate services, thus preventing immediate enrolment in care and hindering follow-up for eventually initiating antiretroviral therapy. Links between HIV testing and counselling and other services, including prevention interventions, must therefore be greatly expanded and strengthened to ensure that testing and counselling services adequately fulfil their role as the main gateway to a comprehensive HIV response.

Lastly, client age and structural, operational, logistical and social barriers, including stigma and discrimination, continue to limit access to existing HIV testing and counselling services and must be addressed. As national programmes search for ways to improve the performance of programmes, priority should be given to HIV testing and counselling approaches that are cost-effective and achieve maximum impact in increasing knowledge of serostatus.

To this end, WHO and UNAIDS support the adoption of a combination of innovative and cost-effective HIV testing and counselling models that protect the human

### Box 4.1

#### Note on methods

The data discussed in this chapter are based on two sources. The first consists of reports sent by countries to WHO, UNAIDS and UNICEF regarding policies, programmes and indicators based on information collected from health facilities. These data were compiled and verified where feasible, in collaboration with countries. However, given the lack of adequate strategic information systems in many countries, they are often not formally validated. Data aggregation across countries may also be methodologically challenging, as definitions may not be standardized. Data on service availability and uptake may not cover all public, private and nongovernmental health facilities in a country or may not include all service delivery points where HIV testing and counselling services are provided. In addition, calculations of aggregate measures, especially regional medians, are based on subsets of countries with available comparable data that may not be fully representative of their respective regions. Specific numbers should hence be interpreted with caution.

The second source of data comprises national population surveys conducted in some low- and middle-income countries. These surveys are generally based on nationally representative samples and typically follow standardized methods that provide comparable data on respondents' reports of their use of specific HIV services, thus enabling coverage to be estimated for various population groups. Some surveys also draw blood from respondents who agree to be tested and can thus provide information on the HIV status among specific groups. The extent to which such surveys can provide estimates of knowledge of HIV status depends on the specific information that is asked of respondents, in particular, regarding their HIV status. The estimates provided by these two sources of data may differ, especially if country reports do not include information from all nongovernmental facilities. Population surveys would generally provide more accurate estimates of uptake.

rights of all individuals, respect principles of informed consent and confidentiality and are suitable to local epidemiology and context (2). An updated HIV testing and counselling framework is currently being developed to assist countries in developing an appropriate and effective combination of HIV testing and counselling approaches to maximize coverage and impact.

This chapter discusses national-level data on the availability and coverage of HIV testing and counselling among adults in the general population. Chapter 6 discusses testing among key populations at higher risk of HIV infection, and Chapter 7 reviews data on testing among pregnant women and among infants.

## 4.2 Policies and programmes for HIV testing and counselling

In 2010, 113 of 126 low- and middle-income countries providing data indicated having national guidelines on the implementation of provider-initiated testing and counselling in health facilities: 20 (77%) in East, South and South-East Asia, 23 (96%) in Latin America and the Caribbean, 15 (79%) in Europe and Central Asia, 37 (82%) in sub-Saharan Africa, and 8 (67%) in the Middle East and North Africa.

Among 38 reporting countries with generalized HIV epidemics, 32 stated that their policy guidelines advise health care providers to initiate testing and counselling

in all encounters patients, a substantial progress from the 19 countries reporting it in 2008. Among countries with low-level or concentrated epidemics, 86 of 93 providing data indicated having policies or guidelines to implement focused testing and counselling for populations at higher risk of HIV infection.

## 4.3 Availability and uptake of HIV testing and counselling

A total of 119 low- and middle-income countries submitted data on the availability of HIV testing and counselling services in health facilities through this year's reporting process (Table 4.1). HIV testing and counselling services were provided by 131 000 health facilities in 2010 versus 107 000 health facilities in 2009 (118 countries), 78 000 in 2008 (111 countries) and 30 300 in 2007 (78 countries).

With respect to the uptake of testing and counselling, 108 countries reported that more than 79 million people received HIV testing and counselling in 2010, whereas 67.4 million tests were reported in 100 countries in 2009 (Table 4.2).<sup>1</sup> Country reports provide the total number of people tested, but these figures do not correct for the fraction of people tested more than once during the course of the year, which may vary considerably among countries.

<sup>1</sup> Annex 2 provides country data.

**Table 4.1** Number of facilities with HIV testing and counselling and number of people aged 15–49 years who received HIV testing and counselling<sup>a</sup> by region (low- and middle-income countries), 2010

Region	Number of facilities with HIV testing and counselling	Number of countries reporting	Number of people 15–49 years old who received HIV testing and counselling <sup>a</sup> in the past 12 months and know the results	Number of countries reporting
Sub-Saharan Africa	36 000	42	45 000 000	44
Latin America and the Caribbean	44 000	23	21 000 000	16
East, South and South-East Asia	29 000	24	19 000 000	23
Europe and Central Asia	20 000	18	8 900 000	16
North Africa and the Middle East	2 000	12	1 100 000	13
<b>Total</b>	<b>131 000</b>	<b>119</b>	<b>95 000 000</b>	<b>112</b>

<sup>a</sup> Based on the numbers of people tested as reported by countries but without correcting for the fraction of people who are tested more than once.

Table 4.2 presents a ratio of facilities per 100 000 population and a ratio of tests per 1000 population to more adequately monitor changes in availability and uptake over time. To analyse trends and ensure methodological accuracy, these ratios have been calculated only for countries that provided comparable data in both 2009 and 2010. It is important to consider, however, that the sub-selection of countries included in the analysis may not be fully representative of their regions, and figures should be interpreted as such.

A total of 104 countries reported information on the number of facilities providing testing and counselling services in both 2009 and in 2010. In this group, the median number of facilities per 100 000 adult population increased by 44% year-on-year, from 5.7 to 8.2. However, there is considerable regional variation: fewer than 2 facilities per 100 000 were reported in North Africa and the Middle East and in East, South and South-East Asia versus 12 in sub-Saharan Africa and 24 in Latin America and the Caribbean.

In a subset of 87 countries who provided data in both 2009 and 2010, the number of tests increased from 64 to about 72 million. Globally, the median number of tests per 1000 adult population rose from 47 to 55, a 17% increase. All regions recorded higher median numbers of tests per 1000 adult population, except for

North Africa and the Middle East, where this remained broadly stable. Variation is also great within region: from 3.6 tests per 1000 in North Africa and the Middle East to 82 in sub-Saharan Africa.

#### 4.4 Coverage of HIV testing and counselling

A growing number of countries are conducting national surveys, including Demographic and Health Surveys, which contain an HIV module. These provide information on the proportion of respondents who have been tested for HIV in the 12 months preceding the survey and on the proportion of those who have ever been tested for HIV. Such surveys, when repeated, can also help identify trends in testing uptake and monitor the extent to which individuals use HIV testing and counselling services.

An analysis of data from countries that have conducted repeat population surveys between 2003 and 2010 reveals substantial increases in HIV testing rates among both women and men (Fig. 4.1). In Lesotho, for instance, the percentage of women tested in the 12 months preceding the survey increased almost seven-fold between 2004 and 2009, from 6.3% to 42%, and almost five-fold among men, from 4.8% to 24%. In the United Republic of Tanzania, testing rates in the last 12 months grew from a baseline of 4.9% in 2003–2004 to 29.5% in 2010 among women and from 7.3% to 25.0% among men.

In addition, HIV testing rates were generally higher among women than among men in five of the six countries conducting repeat surveys in 2009–2010. In the Congo, the proportions of men and women tested in the last 12 months were similar: 7.2% and 6.5%, respectively. Earlier surveys showed higher percentages of testing among men, as observed in Kenya, Mozambique and the United Republic of Tanzania in 2003–2004, whereas results from surveys carried out in 2009–2010 showed the opposite sex distribution. This suggests that recent efforts to increase HIV testing and counselling, including through national campaigns, implementing provider-initiated testing and counselling policies and improving integration between HIV and maternal and child health services have provided greater benefits to women than men.

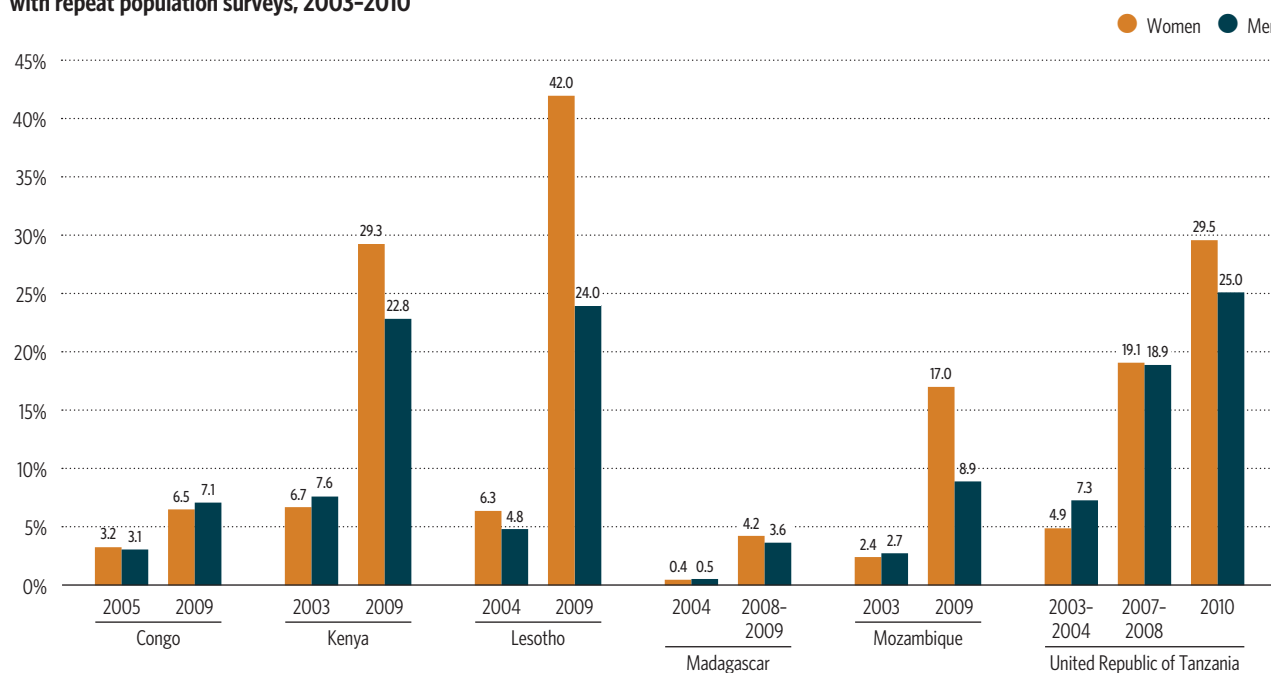
**Table 4.2** Number of facilities that provide HIV testing per 100 000 population and number of tests<sup>a</sup> per 1000 population for countries reporting data for 2009<sup>b</sup> and 2010, by region

Region	Median number of facilities per 100 000 adult population (number of countries reporting)		Median number of tests per 1000 adult population (number of countries reporting)	
	2009	2010	2009	2010
Sub-Saharan Africa	8.6	12	70	82
	(n = 41)		(n = 43)	
Latin America and the Caribbean	18	24	52	56
	(n = 22)		(n = 12)	
East, South and South-East Asia	1.2	1.6	15	22
	(n = 20)		(n = 17)	
Europe and Central Asia	3.0	3.4	35	36
	(n = 15)		(n = 10)	
North Africa and the Middle East	0.9	1.1	3.7	3.6
	(n = 6)		(n = 6)	
<b>Median (all countries)</b>	<b>5.7</b>	<b>8.2</b>	<b>47</b>	<b>55</b>

a Based on the numbers of people tested as reported by countries but without correcting for the fraction of people who are tested more than once.

b Country data can differ from those published in the 2010 universal access report (3) due to updates and corrections subsequently submitted by countries.

**Fig. 4.1 Percentage of women and men receiving an HIV test and test results in the past 12 months preceding the survey in selected countries with repeat population surveys, 2003-2010**



HIV testing uptake differs between men and women in East, South and South-East Asia and may reflect local epidemiological patterns. Among countries submitting data in 2010, the proportion of men receiving an HIV test was higher in countries with larger numbers of people who inject drugs (such as Bangladesh, Indonesia and Myanmar). Relatively more women were tested for HIV in countries with epidemics with unprotected sex as the primary mode of HIV transmission (such as India, Nepal, Sri Lanka and Thailand), where many pregnant women receiving HIV testing through maternal and child health care services.

Lack of knowledge of serostatus by people living with HIV is a major obstacle to realizing the goal of universal access to treatment and prevention. A significant proportion of people living with HIV continue to present late for treatment because they are unaware that they are seropositive, including in high-income countries (4),<sup>1</sup> thus reducing the effectiveness of antiretroviral therapy on morbidity, survival and preventing HIV infection. Surveys that ask people about testing uptake and include a seroprevalence component provide an

**Table 4.3 Percentage of people living with HIV who have ever received an HIV test and their test results before the survey: national population surveys, 2007-2009**

Country	Year of survey	Women	Men	Both
Congo	2009	35.2	21.1	30.9
Kenya	2008-2009	73.5	58.6	68.9
Lesotho	2009	70.8	51.8	64.4
Mozambique	2009	43.2	30.1	38.7
Sao Tome and Principe	2008-2009	a	a	41.0
United Republic of Tanzania	2007-2008	43.7	30.8	39.0

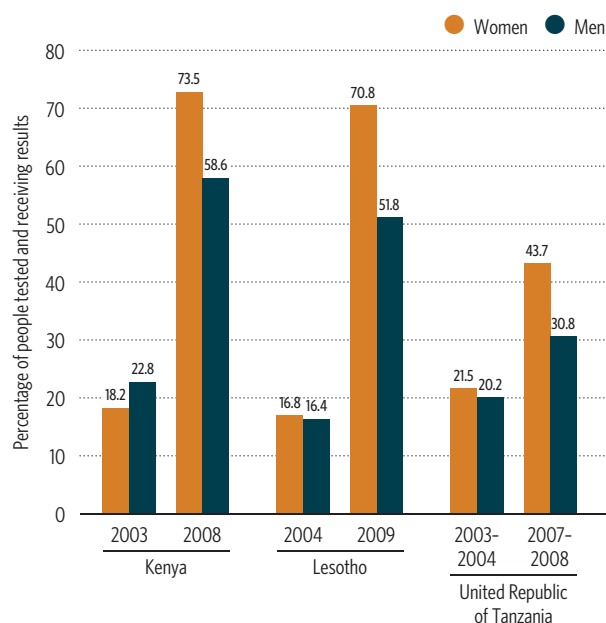
Sources: Demographic and Health Surveys [web site] (6).  
 a When denominators are based on less 50 cases, the corresponding indicator is not reported.

approximate indication of knowledge of HIV status among people living with HIV (5). Table 4.3 reports data on knowledge of HIV status before the survey among people living with HIV for a subset of six African countries with surveys conducted between 2007 and 2009. The percentage of respondents living with HIV who report that they have been tested for HIV provides an upper limit of the estimated number of people living with HIV who know their status.<sup>2</sup> The results show

<sup>1</sup> In the European Union, an estimated one third of people living with HIV are unaware of their HIV status (4). In the United States, the percentage of people with late HIV diagnoses was 32% in 2007, suggesting that at least a similar proportion remained unaware of their serostatus (5).

<sup>2</sup> The accuracy of serostatus knowledge is lower than suggested by this percentage, because some people who have tested may not have received their results or may have seroconverted after an earlier negative test. For example, this is well documented in the 2007 Kenya AIDS Indicator Survey (5).

**Fig. 4.2 Percentage of people living with HIV who have ever been tested and received their results before the survey, repeat population surveys, 2003–2008**



that many respondents were not aware of being HIV seropositive before the survey, with sizable variation between countries: from about 30% in Kenya to close to 70% in the Congo. In countries with available data, women were also more knowledgeable than men about their status.

Successive surveys conducted between 2003 and 2008 in Kenya, Lesotho and the United Republic of Tanzania show an important improvement in serostatus awareness among people living with HIV (Fig. 4.2). The proportion of men living with HIV who were informed of their HIV status increased by more than 50% between 2003–2004 and 2007–2008 in the United Republic of Tanzania and tripled in Lesotho between 2004 and 2009. Progress was also noteworthy among women: in Lesotho, the proportion of women living with HIV who were aware of their status rose by more than 400% in the same period. Despite these accomplishments, available data indicate that many people who test HIV

#### Box 4.2

##### HIV testing and counselling for couples

HIV testing and counselling approaches have almost exclusively focused on providing services for individuals. However, in most countries in sub-Saharan Africa with generalized HIV epidemics, three quarters of adults aged 20–49 years are in cohabiting unions (6). Among people with HIV from high-prevalence, generalized epidemics in sub-Saharan Africa who are in stable relationships, up to half have an HIV-negative partner. This proportion has been reported in both the general population (7–9) and specifically among women and their partners attending antenatal clinics (10).

There are many potential advantages in supporting couples to test together and mutually disclose their HIV status so that they make informed decisions about HIV prevention and conception. Findings from many published studies suggest that people living with HIV and people in serodiscordant couples are more likely to adopt preventive behaviour after learning their HIV status. In addition, providing antiretroviral therapy to the partner living with HIV can significantly decrease transmission to the HIV-negative partner in serodiscordant couples (11,12). Additional potential advantages of having couples test together and share their results include mutual support to access and adhere to antiretroviral therapy and to interventions for preventing the mother-to-child transmission of HIV. WHO is developing normative guidance on interventions targeting serodiscordant couples, including testing and counselling.

#### Box 4.3

##### HIV testing and counselling for adolescents and young people

An estimated 2 million adolescents (aged 10–19 years) are living with HIV; most of them are unaware of their HIV status. Age and sex-disaggregated data on the uptake of HIV testing and counselling among young people are not available for many countries, thus preventing the generation of regional estimates. However, recent survey data from sub-Saharan Africa showed that only 15% of young women aged 15–24 years and 10% of young men have been tested and know their HIV status (13). As such, many adolescents and young adults are diagnosed late and do not access treatment until they are severely immunocompromised. A study in Zimbabwe found that 50% of adolescents admitted for acute care in primary health facilities were living with HIV, and HIV accounted for about 75% of the hospitalized adolescents who died (14). Improving the application of the guidelines for provider-initiated testing and counselling among adolescent clients receiving chronic care could help improve early diagnosis of HIV in adolescents and minimize late initiation on antiretroviral therapy.

Age-specific prevalence data show a clear sex disparity in HIV prevalence by age 15 years, indicating how non-vertical transmission affects adolescents. In Botswana, the HIV prevalence among men 15–19 years old was 2.4% in 2008 but reached 5% among young women in the same age group (15). A similar pattern was observed in South Africa, where men aged 15–19 years had an HIV prevalence of 2.5% in 2008 versus 6.7% among young women (16). This underscores the need to increase testing uptake among adolescents, including through provider-initiated testing and counselling. WHO is currently developing global guidance on HIV testing and counselling for adolescents to help address the gap in diagnosis and uptake of HIV testing and counselling among adolescents. UNICEF, WHO and the United Nations Population Fund are also working to strengthen the capacity of service providers and advocacy by developing a network of trainers and developing guidance on key areas for adolescents living with HIV.

Sources: Botswana AIDS Impact Survey III (BAIS III), 2008: preliminary results (15) and Shisana O et al. (16).

positive are not immediately or adequately linked to the relevant care and treatment services, thus preventing HIV testing and counselling from reaching its ultimate objective, which is to increase the uptake of other essential health interventions.

#### 4.5 Achieving universal access to HIV testing and counselling – the effectiveness of different models

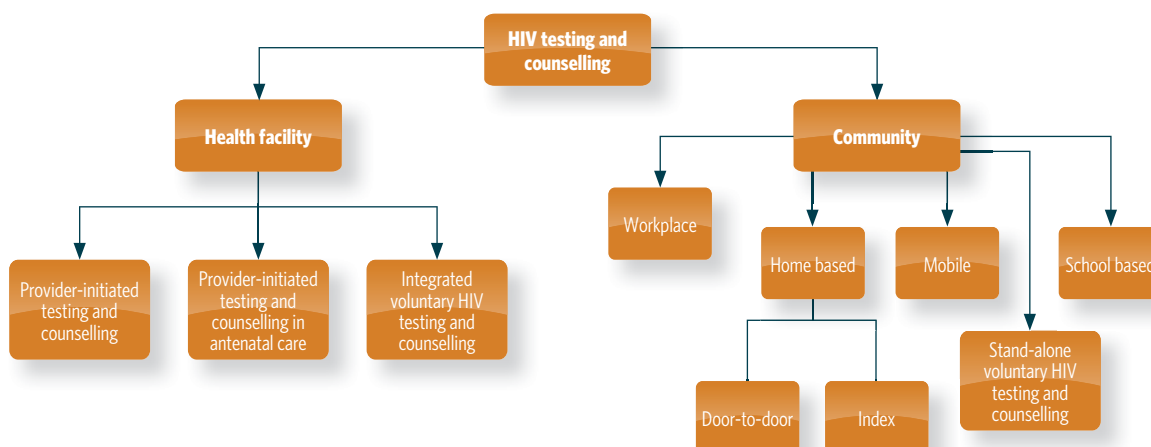
Alternative models of HIV testing and counselling urgently need to be rapidly scaled up to achieve universal knowledge of HIV status and more equitable coverage (Fig. 4.3). Initially, HIV testing and counselling was predominantly delivered through the voluntary testing and counselling model and, more recently, through provider-initiated testing and counselling, which has been shown to increase testing uptake in many settings, including antenatal services (17). Nevertheless, it is increasingly recognized that voluntary testing and counselling and provider-initiated testing and counselling must be complemented by alternative approaches to more rapidly expand the availability and uptake of HIV testing and counselling. Several country programmes have already introduced many of these approaches, which include public campaigns, mobile testing, workplace testing and home- and school-based testing.

Home-based HIV testing and counselling, whereby services may be provided to everyone in a community or to households with a person known to have TB or be living with HIV (an index patient), aims to increase access to HIV testing while reducing the stigma

associated with HIV testing in facility settings (18,19). Evidence suggests that the strategy is cost effective, increases testing uptake (20–22) and reduces the inequities in access of existing testing services (Box 4.2) (23). Nevertheless, data are limited on its impact in diverse epidemiological settings and its effect on access to prevention, treatment, care and support services following a positive result. Mobile HIV testing and counselling aims to improve access to and coverage of HIV testing by using vans, trucks or other mobile sites in addition to existing facilities, such as schools (24). Evidence from Thailand, the United Republic of Tanzania and Zimbabwe suggests that mobile testing can achieve higher testing uptake, including among younger clients, compared with the uptake of clinic-based voluntary testing and counselling (25), and that mobile approaches to HIV testing and counselling are also cost-effective, reaching a high proportion of individuals who are not aware of their HIV status. Critically, door-to-door and mobile HIV testing and counselling may facilitate access to testing and counselling by populations that are more difficult to reach, including those living in rural communities and areas underserved by formal health facilities.

Workplace HIV testing and counselling entails providing employees with HIV testing and counselling at the workplace and making results available promptly, often on the day of testing (26). By providing services at a convenient time and location, while ensuring their confidentiality and voluntary uptake, workplace testing has been shown to increase HIV testing, especially among men, compared with when employees were referred to off-site voluntary testing and counselling (27).

Fig. 4.3 Models of HIV testing and counselling<sup>a</sup>



<sup>a</sup> In the index model, HIV testing and counselling is offered to the household members of an individual with HIV or TB, also known as the index patient.

National HIV testing and counselling campaigns are nationwide efforts to improve the demand for and access to testing services and to normalize HIV testing at the community level. Campaigns may be of variable duration, running from days to years. Various countries have implemented national campaigns, and some have integrated HIV testing and counselling with other disease prevention campaigns in a bid to jointly improve the coverage of multiple preventive services. In South Africa, where an ambitious national campaign was launched in April 2010 to encourage 15 million sexually active individuals aged 12 years and older to test for HIV over a 12-month period, more than 10 million people have been tested, and 1.7 million of these were found to be living with HIV (28). The campaign, the world's largest to date, has engaged health facilities, stand-alone HIV testing sites, mobile testing services, pharmacies and universities, and planning is currently underway to implement it into secondary schools to target children aged 12 years and over. In Kenya, a targeted, one-week community-based campaign against HIV, malaria and diarrhoeal disease was able to reach more than 47 000 people, or 87% of the targeted population aged 15–49 years, with health education counselling, durable insecticide-treated bed-nets, household water filters and condoms. Nearly all (99.7%) participants tested for HIV, and 4.2% tested HIV positive. Importantly, this was the first HIV test for more than 80% of the people reached (29).

It is important for countries to give priority to HIV testing and counselling approaches that are appropriate

to their epidemic and context. Table 4.4 highlights the key findings of a literature review on the populations reached and the estimated costs by model of HIV testing and counselling. Available evidence suggests that home-based testing may be an adequate way to support couples to test together, and workplace testing and campaigns may be especially suitable approaches for men. The limited published data on the costs of the various models indicate that traditional voluntary testing and counselling may be a more expensive model than other community-based approaches and provider-initiated testing and counselling.

Limited evidence is available on the extent to which people are effectively linked to prevention and care services following HIV testing and counselling. Most available data on links between HIV testing and counselling and care services are from studies conducted in health facility settings, such as antenatal care services (30) or TB clinics, and show that people who test positive are often inadequately linked to antiretroviral therapy services for their own clinical benefit (31). This may be a particular challenge for community-based HIV testing and counselling sites without direct connections to care services. In Uganda, for instance, only 10.5% of individuals identified as living with HIV through home-based HIV testing and counselling were linked to antiretroviral therapy (32). Additional research is required to understand how alternative models of testing can best connect individuals identified as HIV positive with prevention and care services (Table 4.4, Box 4.4).

**Table 4.4 Summarizing testing uptake, positivity rates, CD4 counts and cost<sup>a</sup>**

Model of testing	% of people being tested who are male (range)	% of people being tested who are female (range)	% of people being tested who are younger than 25 years	% of people being tested who are tested as a couple	% of people being tested who were tested for the first time	HIV positivity	% of individuals identified as HIV positive with CD4 counts <200 cells/mm <sup>3</sup>	Cost per individual tested (in US dollars)
Voluntary testing and counselling (24,33,34)	34–59%	41–66%	28–42%	4–54% <sup>b</sup>	58–73%	3–22% <sup>c</sup>	48%	19–27
Home-based testing (32,33,35–39)	24–49%	51–76%	7–60%	42–64%	23–95%	4–8%	31–45%	6–14
Community or mobile testing (24,40–42)	38–58%	42–100% <sup>d</sup>	34 <sup>e</sup> –51%	1–28%	69–91%	2–29%	11%	9–20
Workplace testing (26,43,44)	50–59%	40–50%	—	3%	—	4%	30%	—
Provider-initiated testing and counselling (31,33,45,46)	40%	60%	27–51% <sup>e</sup>	6%	—	6–42%	16–47%	12

- a Not all studies are included in each cell.  
b Individuals in Thailand in standard voluntary testing and counselling programmes.  
c People being tested for the first time.  
d 100% uptake reported in a study conducted in Thailand among female sex workers.  
e Individuals younger than 26 years of age.



#### Box 4.4

### Promoting community-based HIV testing and counselling and timely entry to care: The Academic Model Providing Access to Healthcare (AMPATH) Partnership of the United States Agency for International Development in Kenya

An important proportion of people living with HIV in Kenya, as elsewhere in sub-Saharan Africa, continue to access HIV care relatively late in their stage of disease, thus compromising the potential benefits of combination antiretroviral therapy. To address this issue, AMPATH developed a community-based door-to-door HIV testing and counselling service that offers testing and counselling to everyone 13 years and older and to children younger than 13 years of age whose mothers are dead, have unknown vital status, are living with HIV or have unknown HIV status. Since 2008, more than 350 000 people have received testing and counselling through AMPATH. Importantly, 83% of the adults and 86% of the children found to be living with HIV were newly identified cases.

A comparison of HIV testing and counselling approaches in Kenya found that people who were diagnosed as HIV-positive through home-based HIV testing and counselling had significantly higher median CD4 cell counts when entering HIV care than those who tested positive through other points of entry. This implies that antiretroviral therapy can be initiated in a timely manner; in this context, strengthening links between testing and care services is essential to facilitate access and effective follow-up. Moreover, a higher proportion of people entering care treatment from home-based HIV testing and counselling were members of HIV-serodiscordant couples, or were pregnant and could benefit from treatment and prevention interventions tailored to their specific needs.

**Table 4.5** Client characteristics by entry point for HIV testing and counselling

Variables	Home-based counselling and testing (n = 946)	Voluntary testing and counselling (n = 10 261)	Provider-initiated testing and counselling (n = 8073)	TB (n = 272)	P
Median (interquartile range) age in years	37 (30-46)	36 (29-44)	36 (29-44)	36 (30-44)	0.022
Male	268 (28%)	3 537 (34%)	3 050 (38%)	136 (50%)	<0.001
Female	678 (72%)	6 726 (66%)	5 023 (62%)	136 (50%)	
Pregnant	75 (11%)	360 (5%)	321 (6%)	7 (5%)	<0.001
Member of a discordant couple	214 (24%)	649 (7%)	466 (6%)	13 (5%)	0.05
Median (interquartile range) CD4 count per mm <sup>3</sup>	323 (194-491)	217 (87-404)	190 (70-371)	136 (59-266)	<0.001

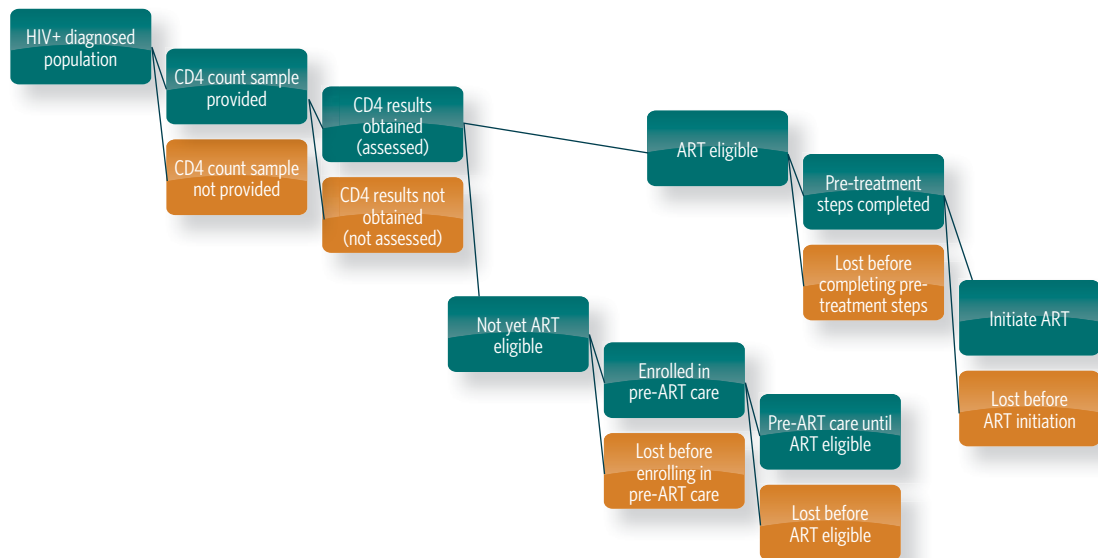
## Box 4.6

### Understanding retention in HIV care between testing and treatment

Although retention on long-term antiretroviral therapy is being increasingly researched and documented (section 5.3.4), evidence on and knowledge about the retention of people living with HIV before they initiate antiretroviral therapy are considerably more limited. It is known, however, that late presentation for antiretroviral therapy remains a major driver of morbidity and mortality, and improving the outcomes of HIV treatment programmes requires strongly linking the various services a person must navigate once being diagnosed with HIV.

A systematic review of the literature on pre-antiretroviral therapy retention in care in Africa has shed important light on this issue. Schematically, the cascade of interventions between testing and counselling and initiating antiretroviral therapy can be divided into three main stages: stage 1, from HIV diagnosis to assessment (receipt of CD4 count or clinical staging); stage 2, from assessment to eligibility for antiretroviral therapy; and stage 3, from eligibility to actual initiation of antiretroviral therapy (Fig. 4.4). For each stage, data were aggregated from relevant articles and subsequently compiled for analysis.

Fig. 4.4 Stages before antiretroviral therapy is initiated



Two main findings emerged from this review. First, it demonstrates that pre-antiretroviral therapy retention is relatively poorly documented: only 28 publications matched the criteria to be included in the analysis, 10 documenting stage 1 and 14 reporting on stages 2 and 3 each. Some studies covered more than one stage, but none followed a cohort through all three stages.

Second, available data suggest that a very high percentage of people are lost at each stage of the cascade: the median proportion of people retained was 59% in stage 1, 46% in stage 2 and 68% in stage 3. Combining these three figures implies that only about 18% of all the people diagnosed as living with HIV but not immediately eligible for antiretroviral therapy remained continuously in care until they became eligible. This figure probably underestimates the actual retention levels because of the low quality of the data and difficulty associated with tracking people who transfer between facilities or who are lost in one stage but later return to care. The most complete study included in the review, a cohort in South Africa followed between 2004 and 2009, estimated an overall retention rate of 33% between the provision of a first CD4 count and the initiation of antiretroviral therapy. This higher figure nevertheless confirms the high proportion of people who are lost to follow-up in the pre-antiretroviral therapy cascade.

These findings therefore underscore the need to urgently strengthen patient tracking systems to improve knowledge of the retention cascade and to implement timely corrective interventions. The rates of attrition must be monitored at all stages, and the underlying causes of poor performance of pre-antiretroviral therapy care systems in retaining people must be adequately identified, including those related to health care behaviour among people who do not feel sick, accessibility of the health care system, cost, stigma and discrimination.

In September 2011, WHO hosted an international consultation on pre-antiretroviral therapy and antiretroviral therapy retention to share country experiences and shed light on the key constraints, at the health system and individual levels, that cause attrition in resource-limited settings. Efforts are ongoing to develop comprehensive strategies and recommendations to improve monitoring and optimize retention in care.

Source: Rosen and Fox (47)

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# KEY FINDINGS

## Scaling up treatment and care for people living with HIV

# 5

At the end of 2010, 6 650 000 people were receiving antiretroviral therapy in low- and middle-income countries, an increase of over 1.4 million people, or 27%, from December 2009. Sub-Saharan Africa had the greatest increase in the absolute number of people receiving antiretroviral therapy in 2010, from 3 911 000 in December 2009 to about 5 064 000 a year later.

Overall, the estimated coverage of antiretroviral therapy among adults and children in low- and middle-income countries continued to increase and was 47% [44–50%] of the 14.2 million [13 400 000–15 000 000] people eligible for treatment at the end of 2010, up from 39% [37–42%] observed in December 2009.

As of December 2010, ten low- and middle-income countries, including three countries with generalized epidemics (Botswana, Namibia and Rwanda), had already achieved universal access to antiretroviral therapy, defined as providing antiretroviral therapy to at least 80% of the people eligible for treatment. Seven additional countries, including two countries with generalized epidemics (Swaziland and Zambia), had estimated coverage levels between 70% and 79%.

The number of children younger than 15 years of age receiving antiretroviral therapy in low- and middle-income countries increased by 29% between 2009 and 2010. About 456 000 children younger than 15 years were receiving antiretroviral therapy at the end of 2010, up from 354 600 in December 2009. However, the estimated coverage is much lower among children (23%) than among adults (51%).

Among 109 reporting countries, the estimated antiretroviral therapy coverage was higher among women, estimated at 53%, than among men (40%).

Moderate levels of transmitted drug resistance have been observed in some countries. Among 11 surveys conducted in 2009 to monitor transmitted HIV drug resistance, five showed moderate (between 5% and 15%) transmitted HIV drug resistance.

Data on the proportion of people who remain on antiretroviral therapy over time in low- and middle-income countries continue to show that most attrition (discontinuation of antiretroviral therapy) occurs within the first year of starting therapy. The average retention rate at 12 months after initiating antiretroviral therapy was 81% (92 reporting countries), 75% at 24 months (73 countries) and 67% at 60 months (46 countries).

In low- and middle-income countries outside the Americas (45 reporting countries), most (97%) adults were receiving first-line regimens and 3% second-line regimens as of December 2010. In the Region of the Americas (21 reporting countries), a substantially higher proportion (28%) of adults received second-line regimens, and 3% received third-line regimens.

Among 93 reporting countries, 88 already recommend initiating antiretroviral therapy for everyone with CD4 counts less than 350 cells per mm<sup>3</sup> as of late 2010. Among 87 reporting countries, 84 have also adopted international guidelines that recommend shifting away from stavudine-based to zidovudine- or tenofovir-based regimens.

Progress continues to be made in expanding access to and uptake of HIV testing and counselling for people with tuberculosis (TB). A total of 2.1 million people with TB were tested for HIV in 2010, equivalent to 34% of all notified cases, versus 28% in 2009 and 3% in 2004.

As of December 2010, 58% of reporting low- and middle-income countries (69 of 119) indicated that isoniazid preventive therapy was a part of their package of interventions for people living with HIV; 90% (113 of 125) indicated having policies to promote intensified case-finding, and 78% (98 of 126) had a policy for TB infection control. Coverage of isoniazid preventive therapy remained low, as only 12% of the reported number of people living with HIV newly enrolled into care received isoniazid preventive therapy in 2010.

## 5.1 Overview and key challenges

At the end of 2010, 6 650 000 people were receiving antiretroviral therapy in low- and middle-income countries. This represents an increase of 27%, or 1.4 million people, from December 2009, and a 17-fold increase from the approximately 400 000 people recorded in December 2003. Ten low- and middle-income countries, including three countries with generalized epidemics (Botswana, Namibia and Rwanda) and seven countries with concentrated or low-level epidemics (Cambodia, Chile, Croatia, Cuba, Guyana, Nicaragua and Slovakia) have achieved universal access to antiretroviral therapy, commonly understood as providing antiretroviral therapy to at least 80% of the people who need it (Table 5.5). Seven additional countries, including two countries with generalized epidemics (Swaziland and Zambia) and five countries with concentrated epidemics (Argentina, Brazil, Dominican Republic, Mexico and Uruguay) have estimated coverage levels between 70% and 79%.

Despite this exceptional progress, the estimated global coverage in low- and middle-income countries is still less than 50% (based on the 2010 WHO guidelines on initiating treatment (1) at a CD4 count <350 cells per mm<sup>3</sup>). People living with HIV have extensive attrition between HIV testing and counselling and treatment, care and support services. Late presentation for treatment is still common in many settings, including in high-income countries (2), and a considerable proportion of people are lost to follow-up after initiating antiretroviral therapy (see Box 4.6). Moreover, the current rate of enrolment on antiretroviral therapy is insufficient to reach the goal, agreed at the United Nations High-Level Meeting on AIDS held in June 2011, of working towards providing antiretroviral therapy to 15 million people by 2015 (3). Between 2008 and 2010, about 1.3 million new people were enrolled and retained on antiretroviral therapy per year and, at this rate, less than 14 million people will be receiving antiretroviral therapy at the end of 2015.

This has several important operational and strategic implications. Under current initiation and attrition rates, expanding antiretroviral coverage to 15 million people by 2015 would entail further increasing the number of people initiating antiretroviral therapy every year. However, in the current economic and financial context, doing so would be particularly challenging,

and increasing the efficiency and effectiveness of the global HIV response becomes ever more relevant and necessary.

One area in which considerable efficiency gains can be realized is in improving retention throughout the cascade of interventions, from testing and counselling to initiating and maintaining lifelong antiretroviral therapy. Reducing the currently high proportion of people living with HIV who initiate antiretroviral therapy but are eventually lost to follow-up is key to achieving universal access by 2015 (Box 4.3).

Current service delivery models must be adapted to expand service coverage and to cope with large and growing cohorts of people living with HIV. In 15 years, most of the 34 million [31 600 000–35 200 000] people currently living with HIV, as well as many of those who will become HIV positive, will require antiretroviral therapy.

Although much has been accomplished, services are often too distant from the users of the services, and systems can be too difficult to navigate. Affected communities and people living with HIV are still insufficiently engaged and mobilized. The current model for HIV treatment must evolve if universal access is to be achieved and sustained.

This chapter is divided into two parts. The first introduces a set of five key strategies – collectively known as the Treatment 2.0 initiative – to accelerate progress towards universal access, describes its main components and shows how focused action on each of its five key areas can improve efficiency, coverage and impact. The second part provides detailed data on progress made in 2010 in scaling up access to antiretroviral therapy and care interventions, including combined TB and HIV interventions, in low- and middle-income countries.

## 5.2 Catalysing the next phase of scaling up treatment: the Treatment 2.0 initiative

In June 2010, the UNAIDS Secretariat and WHO launched Treatment 2.0, an initiative designed to improve the efficiency and impact of HIV care and treatment programmes in resource-limited countries and ultimately ensure their long-term sustainability. Treatment 2.0 builds on the programmatic and clinical

### Box 5.1

#### Treatment 2.0 priority areas and goals for 2020

##### 1. Optimize drug regimens

Effective, affordable, one-pill, once-daily antiretroviral regimens with minimal toxicity or drug interactions and high barriers to resistance are available in low- and middle-income countries.

##### 2. Provide access to point-of-care and other simplified diagnostics and monitoring tools

A package of simple, affordable, reliable, quality-assured point-of-care and other simplified diagnostics is available and accessible in low- and middle-income countries.

##### 3. Reduce costs

High-quality HIV care and treatment programmes are available at the lowest possible cost with optimal efficiency to everyone who needs them in low- and middle-income countries.

##### 4. Adapt delivery systems

HIV care and treatment programmes are decentralized and appropriately integrated with other HIV and non-HIV health services, with increased community engagement in service delivery and improved retention in care.

##### 5. Mobilize communities

People living with HIV and key populations at higher risk of HIV infection are fully involved in demanding, creating, planning, delivering and evaluating quality-assured, human rights-based HIV care and treatment programmes in all low- and middle-income countries.

evidence and experience of the past 10 years of scaling up global antiretroviral therapy and seeks to simplify and optimize HIV diagnosis, treatment and care through a series of innovations and efficiency gains in five priority areas (Box 5.1) (4). Leveraging the positive impact that antiretroviral therapy has on HIV prevention is also an important cross-cutting aspect of Treatment 2.0 (sections 3.2.3.2 and 5.4.2).

#### 5.2.1 Optimize drug regimens

Drug regimen optimization entails establishing optimal dosages of antiretroviral medicines, reducing the pill burden by developing fixed-dose combinations and designing improved formulations for children. Potential areas for optimization include simplifying the production of active pharmaceutical ingredients, increasing drug bioavailability, reducing doses and using current and new drugs in novel combinations with the aim of improving the efficacy, convenience, durability, stability, cost and tolerability of regimens.

Fully optimal regimens that meet the target product profile may not be available commercially in the near future. However, current drugs and formulations can

### Box 5.2

#### Scaling up fixed-dose combination antiretroviral drugs for children in Uganda

Fixed-dose combination antiretroviral drugs for children offer many advantages over syrups, especially greater convenience and lower costs. In Uganda, a carefully coordinated approach to training and procurement among all stakeholders, under the leadership of the Ministry of Health, streamlined the country's fragmented supply chain and created the conditions for the rapid uptake of fixed-dose combinations for children and a smooth transition away from syrups and single-drug formulations.

The Ministry of Health, in partnership with UNITAID and the Clinton Health Access Initiative, implemented a multi-prong strategy that involved training-of-trainers with clinicians representing both government facilities and major implementing partners for children to educate them on the benefits of fixed-dose combinations for dosing, adherence and ease of drug supply. Further, it provided additional support to the forecasting unit to help in procuring the new fixed-dose combinations and developed a logistics plan to track existing stocks of syrups and single-drug formulations to ensure that drugs were not wasted during the transition period.

In response to these actions, the use of fixed-dose combinations among eligible children living with HIV rose from 17% in January 2009 to 82% in June 2010. Because of the nature of the country's forecasting system - which based new orders on formulations consumed during the previous quarter - and the existence of remote, hard-to-reach facilities located well outside city centres, uptake of fixed-dose combinations subsequently stabilized. To close this gap, in early 2011 the Ministry of Health undertook a detailed analysis and identified each facility still using syrups, single-drug formulations and other suboptimal formulations and agreed with all partners to completely phase out the procurement of these formulations.

With the cessation of orders for 14 suboptimal formulations for children and the consumption of the remaining limited supply of suboptimal stock in early 2011, 100% of the 22 798 eligible children living with HIV receiving treatment were accessing fixed-dose combinations as of March 2011. This transition has saved Uganda more than US\$ 2 million since 2009. In addition, the use of fixed-dose combinations has considerably eased the management of the country's drug supplies and reduced the burden on all children receiving antiretroviral therapy.

be improved in the interim by providing clear targets for innovator and generic drug manufacturers to invest in enhancing current antiretroviral therapy regimens. WHO and partners have taken steps to support this process. A list of short-term priority actions was published in July 2011 to guide the development of optimized first- and second-line antiretroviral regimens for adults and adolescents and for children in the following three years (5).



### 5.2.2 Provide access to point-of-care and other simplified diagnostics and monitoring tools

A package of affordable diagnostics tests, performed at the point of service delivery, is a prerequisite to further expanding HIV testing, reducing late initiation of antiretroviral therapy and ensuring adequate monitoring of lifelong HIV therapy, in particular at the level of primary health care settings and within the community.

Recent field-testing of point-of-care CD4 testing and of dried blood spots for quantifying viral load and early infant diagnosis has demonstrated promising results (6,7). Recent research has confirmed the accuracy of point-of-care tests for CD4 count, clinical chemistry and haemoglobin conducted in a primary health setting. The study showed that, for all three assays, haemoglobin, CD4 count and alanine aminotransferase, point-of-care and laboratory test results were comparable. Importantly, nurses were able to operate the point-of-care devices reliably and reproducibly, thus making such devices key tools to support decentralized service delivery (Box 5.3) (8). Likewise, GeneXpert, which uses a self-contained polymerase chain reaction (PCR) platform for rapid

#### Box 5.3

##### Implementing point-of-care CD4 testing in Mozambique

Recent research has shown that the loss to follow-up after HIV infection is diagnosed but before antiretroviral therapy is initiated may be as high as 50% (10). A large part of this loss occurs between HIV diagnosis and CD4 staging, since primary health clinics, which often do not have on-site laboratory facilities, must rely on central laboratories, thus delaying the delivery of results and preventing immediate enrolment for those who need it.

In Mozambique, the Alere PIMA point-of-care CD4 device was implemented at selected primary health clinics in the southern Maputo and central Sofala provinces. The test was used for immunological staging of everyone diagnosed as HIV-positive and enrolling in HIV care. After the point-of-care CD4 testing was introduced, the total loss to follow-up of the enrolled people living with HIV declined by half, from 64% to 33%, and the proportion of people initiating antiretroviral therapy with CD4 staging increased from 11% to 18%. The time taken to complete CD4 staging was reduced from a median of 27.5 days to just one day. Faster CD4 results also reduced the time between enrolment in care after HIV diagnosis and initiating antiretroviral therapy from a median of 48 to 20 days (11).

diagnosis of TB and resistance to rifampicin, can substantially facilitate the diagnosis and management of TB among people living with HIV. More than 30 countries are currently in the process of rolling out the GeneXpert technology, and plans are currently being developed to leverage the GeneXpert platform to eventually perform HIV viral load testing as well (9).

WHO, UNAIDS and partners are currently working to determine the ideal package of point-of-care diagnostics and other simplified monitoring tools, identify the bottlenecks to developing and delivering new technologies and accelerate the critical path towards making them available.

### 5.2.3 Reduce costs

There are significant opportunities for reducing costs and improving efficiency in HIV programmes. The new UNAIDS investment framework estimates that, if countries target HIV spending efficiently, annual resource needs should peak at US\$ 22 billion in 2015 and subsequently decline, along with HIV transmission, morbidity and mortality rates (Box 1.1) (12).

Commodity costs can be reduced by pooling the procurement of drugs (Box 5.4) and diagnostics and through simplified manufacturing processes, potentially reducing the doses of drugs, using fixed-dose combinations and negotiating for additional reductions in the prices of active pharmaceutical ingredients and finished formulations. Low- and middle-income countries can also take greater advantage of flexibilities under the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) to ensure that life-saving health commodities are available to all in need (13).

Efficiency can be improved in service delivery as well, especially by shifting tasks, expanding the role of communities and developing feasible strategies to improve retention in care. In South Africa, the costs associated with providing antiretroviral therapy to people living with HIV managed by nurses at decentralized facilities were 11% lower than for doctor-managed people in central hospitals – with lower rates of death and loss to follow-up among the people at the decentralized facilities (Box 5.4) (14). Such results suggest that this strategy can expand treatment capacity and conserve resources without compromising outcomes and the quality of care.

#### Box 5.4

##### Reducing treatment costs in South Africa by improving the procurement of antiretroviral medicines

As of December 2010, almost 1.4 million people were receiving antiretroviral therapy in South Africa. However, this represents only 55% of the people who were eligible to receive treatment. To expand coverage while controlling costs and ensuring the sustainability of its national antiretroviral therapy programme, in December 2010 the Government of South Africa introduced a new tender procedure for purchasing antiretroviral drugs. By combining strategies to increase competition among suppliers and improve price transparency, it substantially reduced the prices paid for the antiretroviral drugs used in the national HIV programme (Table 5.1).

**Table 5.1** Price reductions of some key antiretroviral drugs used in South Africa after the new tender strategy

Antiretroviral drug	2008 price (in rands)	2010 price (in rands)	Price reduction (%)
Efavirenz (600-mg tablet)	R107.07	R39.22	63%
Lamivudine (150-mg tablet)	R29.77	R18.22	39%
Nevirapine (200-mg tablet)	R31.53	R22.99	27%
Tenofovir (300-mg tablet)	R155.60	R54.82	65%

Source: Government of South Africa, 2010.

To increase competition among drug manufacturers, efforts were made to ensure the registration of an adequate number of products with the country's Medicines Control Council, and all potential suppliers - including international providers - were encouraged to participate. In addition, the government published a reference price list based on international transactional prices, and suppliers were required to provide a breakdown of their cost components so that price changes could be monitored through the life cycle of the tender.

The percentage decrease in the cost of individual antiretroviral drugs ranged from 4% to 81%. For instance, whereas in 2008 a month's supply of a 300-mg tenofovir tablet cost the government R155 (about US\$ 23), its price fell to less than R55 (US\$ 8) in the new tender process. In total, antiretroviral drug costs fell by 53%, generating estimated savings of about R4.7 billion (US\$ 685 million) during the next two years (18). This should allow the national antiretroviral therapy programme to treat twice as many treatment-eligible people as before. Because of delays in the registration process with the country's Medicines Control Council, the new tender included few fixed-dose combinations, but their participation is expected to increase in future rounds (19).

Alternative models of service delivery, including home-based HIV treatment, can also cut the costs people incur to access services, which often function as an important barrier to successfully scaling up treatment in various settings (15,16). In Jinja, Uganda, by decentralizing services and bringing them closer to end-users, a home-based treatment programme was able to cut the costs incurred to access care by more than 50% in the first year and by 66% thereafter, while achieving rates of viral suppression and mortality similar to those of a facility-based HIV care model (17). Given the lifelong nature of antiretroviral therapy, the impact of such a large difference in costs to access care may become even more crucial as people accumulate years of treatment.

#### 5.2.4 Adapt delivery systems

Although the number of health facilities providing antiretroviral therapy has increased dramatically since antiretroviral therapy began to be rapidly scaled up in 2003 (section 5.3.3), service coverage is still limited, as only 47% of the people currently eligible for treatment have access in low- and middle-income countries. Further expanding and maintaining antiretroviral therapy coverage in high-prevalence settings requires bringing services closer to end-users, especially to

poorer, rural and other underserved areas, which often cater to significantly marginalized populations (20). Systems must also be integrated and streamlined so that users can more easily navigate the often-complex chain of interventions from testing to care, treatment and support. Coverage of interventions to address comorbidity, including TB, viral hepatitis and other needs, such as family planning for women of childbearing age, also needs to dramatically increase. This requires establishing and improving links with other health programmes whenever appropriate.

This shift away from the current highly specialized service delivery model implies further decentralizing services to the primary health care level, with concomitant task-shifting to various types of health professionals, including nurses, health assistants and others, while expanding and strengthening links to community systems. This combination strategy has shown encouraging results in multiple settings, with treatment outcomes, including survival and retention rates, similar to or sometimes significantly better than those observed among people receiving doctor-managed, hospital-based care (Boxes 5.5 and 5.6) (14,17,20–23). Recent evidence from country programmes has also shown that integrating HIV treatment into

other areas of health care, such as antenatal care, maternal, newborn and child health, TB or drug dependence services, is feasible and effective and leverages scarce resources (Boxes 5.7 and 5.8) (24–26).

Programme managers are using and developing various strategies to enhance service delivery by adapting it to local circumstances and people’s needs. One of these is “down-referral”, in which the management of clinically stable people is delegated from a higher-level facility to a lower-level facility within the health system, often geographically closer to the people’s residence. Down-referral to primary health care facilities can increase the capacity of initiation sites to enrol new people who are eligible for antiretroviral therapy and provide care for people with complicated conditions who require referral. In addition, by reducing travel distances for people living with HIV, lowering costs to access care and facilitating community involvement, down-referral can improve adherence and retention rates (20,29,30). Nevertheless, introducing or strengthening systems to educate, support and track people not attending appointments at the primary health care level is essential to ensure that down-referral strategies are successfully implemented (31,32).

Although decentralizing service delivery to primary health care facilities is key to expanding coverage, it is often hindered by the severe lack of human resources in many resource-limited settings, especially in rural areas and slums. In such circumstances, task-shifting, which involves redistributing selected tasks from physicians to adequately trained nurses and from nurses to adequately trained lower-level health workers or lay providers, often at the district level, becomes necessary

to expand services and increase coverage (22,33–35). Indeed, programmes that have successfully scaled up HIV treatment and care have often done so through a combination of these strategies to optimize outcomes (Box 5.6).

In addition to enhancing coverage and treatment outcomes, decentralizing HIV services may also positively affect the health-related quality of life and perceived quality of care among people receiving antiretroviral therapy (38,39). To accelerate progress, WHO has begun to develop normative and operational

**Box 5.5**

**Integrated service delivery**

Various definitions of service integration exist and are used in the public health literature (27). WHO (28) has described integrated service delivery as “the organization and management of health services so that people get the care they need, when they need it, in ways that are user-friendly, achieve the desired results and provide value for money”. As such, integration may be seen as a continuum, rather than two extremes. Some services can be delivered and managed separately by different teams at different locations, but in other cases service delivery can be improved if structures and functions are more closely linked (such as links between HIV and maternal, newborn and child health services through strengthened referrals) or even fully integrated (such as one-stop shops) (28).

**Box 5.6**

**Scaling up HIV treatment in Thyolo, Malawi through decentralization and task-shifting**

In Thyolo, Malawi, the district hospital initiated the first people on antiretroviral therapy in April 2003, mainly by clinical officers. Antiretroviral therapy care tasks were shifted from clinical officers to medical assistants in 2005, resulting in the possibility to decentralize the initiation of antiretroviral therapy to health centres. In 2007, the policy was further revised to allow nurses to start people on antiretroviral therapy. Another important adaptation was the shifting of HIV testing and counselling from nurses to trained health surveillance assistants, a type of community health worker initially created to be responsible for preventive activities and organizing disease outbreak responses. Decentralizing and shifting tasks related to accessing antiretroviral therapy in hospitals and health centres had considerable impact (Fig. 5.1) (36).

Improved coverage allowed people to start treatment earlier at a higher CD4 count, and the time to initiation decreased from nearly 100 days in 2003 to less than three weeks in 2009. Based on the 2006 guidelines on antiretroviral therapy for adults and adolescents, universal access (coverage of at least 80% of estimated needs) was achieved in 2007 in Thyolo (37).

**Fig. 5.1 Access to antiretroviral therapy in Thyolo district (2004–2009)**

Year	Hospital	Health centre	Total
2004	100	0	100
2005	170	0	170
2006	250	80	330
2007	240	110	350
2008	220	130	350
2009	210	190	400

Source: Bemelmans et al. (21).

guidance for improving the delivery of services, including key issues of equity, community consultation, community-based service delivery, task-shifting and integrating HIV care into TB and antenatal and primary health care clinics in resource-limited settings.

Decentralization processes must consider the need to strengthen drug procurement and supply chain management, improve referral and communication systems and implement targeted approaches to tackle HIV-related stigma and discrimination at the local level.

### Box 5.7

#### Improving treatment outcomes and impact by decentralizing service delivery in South Africa

In Johannesburg, South Africa, down-referring stable people receiving antiretroviral therapy from a doctor-managed, hospital-based specialized antiretroviral therapy clinic to a nurse-managed primary health care facility has been found to be cost-effective (14). Compared with a matched sample of people eligible for down-referral but not down-referred, after 12 months, the combined rate of death and loss to follow-up among people managed at the primary care level was 1.7% versus 6.2% at the treatment-initiation site (Table 5.2).

**Table 5.2 HIV treatment outcomes of people 12 months after they become eligible for down-referral**

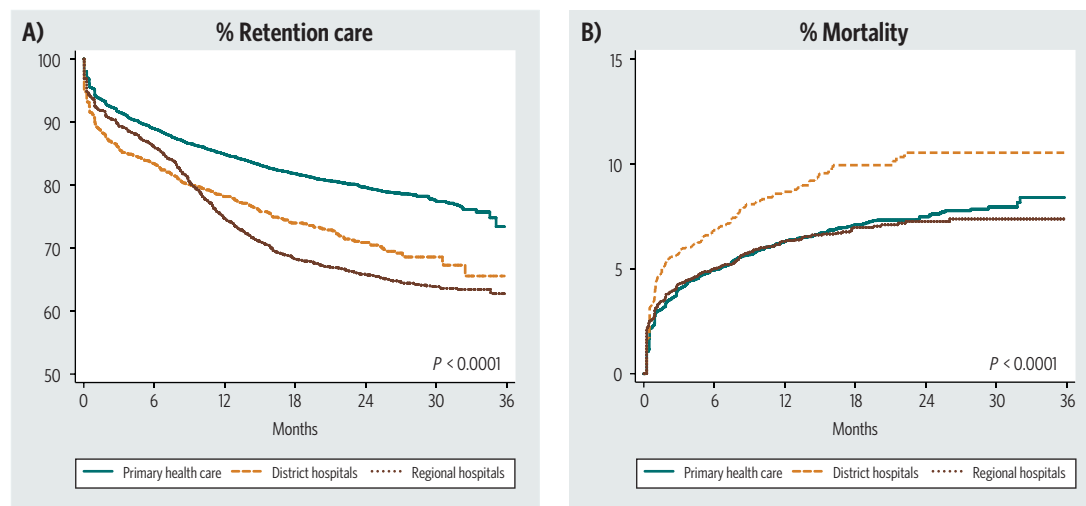
Outcome	Treatment-initiation group (n = 1623)	Down-referral group	Relative risk (95% CI)
Total	2136 (100%)	712 (100%)	
In care and responding	1912 (89.5%)	680 (95.5%)	1.07 (1.04-1.09)
In care but not responding	91 (4.3%)	20 (2.8%)	0.66 (0.39-1.06)
No longer in care	133 (6.2%)	12 (1.7%)	0.27 (0.15-0.49)
Died	25 (1.2%)	0 (0%)	
Lost to follow up	108 (5.1%)	12 (1.7%)	

Source: Long et al. (14).

The average cost per person-year for those in care and responding at 12 months was US\$ 492 for down-referred people and US\$ 551 for people remaining at the treatment-initiation site, a statistically significant difference of 11%.

A comparative study among antiretroviral therapy-naïve adults enrolled at primary, district and regional hospitals in four South African provinces (Western Cape, Eastern Cape, KwaZulu-Natal and Mpumalanga) also found superior treatment outcomes among people managed at the primary care level (40). Although the people at the primary care facilities had more advanced HIV illness when starting antiretroviral therapy, the differences in retention in care and mortality rates between the people attending different facilities were large and statistically significant. Viral suppression at primary health care facilities was also similar to and often considerably better than the rates observed at higher-level facilities.

**Fig. 5.2 Four provinces in South Africa, December 2004–December 2007. A) Cumulative probability of being in care. B) Cumulative probability of mortality.**



Source: Fatti et al. (40).

### 5.2.5 Mobilize communities

Fully engaged, mobilized communities are essential to catalyse the demand for antiretroviral therapy and other HIV services, to promote fair prices for medicines and other health commodities, to design, improve and deliver services – particularly for underserved key populations at higher risk for HIV infection – and to ensure that care and treatment programmes promote and protect human rights. As coverage expands, non governmental organizations and community-based service providers will require increased funding and technical support to mobilize communities and expand the range and quality of community-based services required to achieve universal access goals.

In Rwanda, which reached antiretroviral therapy coverage of 88% in 2010, the national HIV programme has engaged networks of people living with HIV in treatment and care for many years. Other countries are also strengthening links between communities and health systems to support programme design and implementation. In Viet Nam, peer educators, including people living with HIV and members of key populations at higher risk for HIV infection, are engaged to take active roles in HIV prevention, treatment, care and support (41,42) (see Box 5.12). Swaziland recently

launched a national Treatment 2.0 campaign centred on a community approach to rapidly achieve universal access to testing and treatment.

UNAIDS and the International Treatment Preparedness Coalition have led a series of regional community consultations to mobilize support and identify community needs so that they can take on expanded roles in stimulating demand for HIV services, participating in national, regional and global planning bodies and in delivering and managing HIV testing, counselling, care and treatment programmes.

## 5.3 Antiretroviral therapy

### 5.3.1 Global, regional and country progress in access to antiretroviral therapy

At the end of 2010, 6 650 000 people were receiving antiretroviral therapy in low- and middle-income countries, an increase of 27% from December 2009 (Table 5.3 and Fig. 5.3). In total, 1 675 000 people initiated treatment in 2010.<sup>1</sup>

<sup>1</sup> A total of 121 countries provided data on eligible adults and children who newly initiated antiretroviral therapy during 2010, representing 95% of all people on antiretroviral therapy in 2010.

#### Box 5.8

##### Mobilizing communities to enhance antiretroviral therapy delivery and retention in Mozambique

To address constraints on capacity and human resources and to improve retention over time, Médecins Sans Frontières and the authorities of Tete Province in Mozambique launched in 2008 an innovative out-of-clinic model of antiretroviral therapy distribution and adherence monitoring by community antiretroviral therapy groups.

In this model, people receiving antiretroviral therapy who were stable for six months were invited to form groups. Each month a group meeting was held in the community before each clinic visit and the designated group leader counted each member's pills (adherence check). Any new signs or symptoms, adherence problems or intention to relocate to another area or interrupt treatment were discussed and documented for each person on the group-held group monitoring form. Individual appointment cards were given to the group representative so that they could be taken to the health facility to be completed. At the facility level, the group monitoring form was jointly reviewed and the group representative discussed each group member with a counsellor or clinician. Antiretroviral therapy and prophylactic drugs for each group member were then given to the group representative, to be eventually distributed upon return to the community.

Between February 2008 and May 2010, 1384 people living with HIV were enrolled in 291 groups, with an average of 4.75 people per group. The median follow-up time within a group was 12.9 months. Early outcomes have been satisfactory in terms of mortality and retention in care, showing the feasibility of out-of-clinic approaches. During this time, 83 (6%) people were transferred out, and of the 1301 people still in community groups, 1269 (97.5%) remained in care, 30 (2.3%) died, and 2 (0.2%) were lost to follow-up. Moreover, in terms of workload reduction, staff members at health facilities reported that community antiretroviral therapy groups resulted in an approximately four-fold reduction in consultations among the people receiving care based on a community antiretroviral therapy group.

Beyond considerably reducing the transport and opportunity costs associated with antiretroviral therapy uptake, the community antiretroviral therapy group model encourages people to take greater responsibility for their own health by engaging them as active partners in health care delivery and promotes the development and reinforcement of social networks and peer support, which have been identified as important ways to support treatment adherence.

Source: Decroo et al. (43).

As the region most affected by the epidemic, sub-Saharan Africa recorded the greatest increase in the absolute number of people receiving treatment in 2010, from 3 911 000 in December 2009 to about 5 064 000 a year later – a 30% increase. In all other regions, growth rates were lower than 25% from 2009 to 2010.

Latin America is the region with the smallest percentage increase in the number of people receiving antiretroviral

therapy in 2010 versus 2009: 11%. Although this may be partly explained by the fact that most large countries in the region have already achieved relatively high levels of coverage, it may also be related to difficulty in scaling up HIV testing and counselling and effectively diagnosing HIV infection in early stages (44).

Twenty countries accounted for 84% of the people receiving antiretroviral therapy in low- and middle-

**Table 5.3** Number of adults and children (combined) receiving and eligible for antiretroviral therapy, and estimated percentage coverage in low- and middle-income countries by region, December 2009 to December 2010<sup>a,b,c</sup>

Geographical region	December 2010			December 2009		
	Number of people receiving antiretroviral therapy	Estimated number of people eligible for antiretroviral therapy [range] <sup>a</sup>	Antiretroviral therapy coverage [range] <sup>d</sup>	Number of people receiving antiretroviral therapy	Estimated number of people eligible for antiretroviral therapy [range] <sup>a</sup>	Antiretroviral therapy coverage [range] <sup>d</sup>
Sub-Saharan Africa	5 064 000	10 400 000 [9 700 000–11 000 000]	49% [46–52%]	3 911 000	9 600 000 [9 000 000–10 200 000]	41% [38–43%]
Eastern and southern Africa	4 221 000	7 600 000 [7 100 000–8 000 000]	56% [53–59%]	3 203 000	7 000 000 [6 600 000–7 400 000]	46% [43–48%]
Western and central Africa	842 000	2 800 000 [2 600 000–3 100 000]	30% [28–33%]	709 000	2 600 000 [2 400 000–2 800 000]	27% [25–30%]
Latin America and the Caribbean	521 000	820 000 [710 000–920 000]	63% [57–73%]	469 000	780 000 [670 000–870 000]	60% [54–70%]
Latin America	461 000	720 000 [620 000–810 000]	64% [57–74%]	416 000	690 000 [590 000–780 000]	60% [53–70%]
Caribbean	60 300	100 000 [91 000–110 000]	60% [53–67%]	52 400	93 000 [84 000–110 000]	56% [50–63%]
East, South and South-East Asia	922 000	2 300 000 [2 100 000–2 500 000]	39% [36–44%]	748 000	2 300 000 [2 000 000–2 400 000]	33% [31–37%]
Europe and Central Asia	129 000	570 000 [500 000–650 000]	23% [20–26%]	114 500	520 000 [450 000–600 000]	22% [19–25%]
North Africa and the Middle East	14 900	150 000 [120 000–190 000]	10% [8–13%]	12 400	140 000 [110 000–180 000]	9% [7–12%]
<b>Total</b>	<b>6 650 000</b>	<b>14 200 000</b> <b>[13 400 000–15 000 000]</b>	<b>47%</b> <b>[44–50%]</b>	<b>5 255 000</b>	<b>13 300 000</b> <b>[12 400 000–14 100 000]</b>	<b>39%</b> <b>[37–42%]</b>

Note: some numbers do not add up because of rounding.

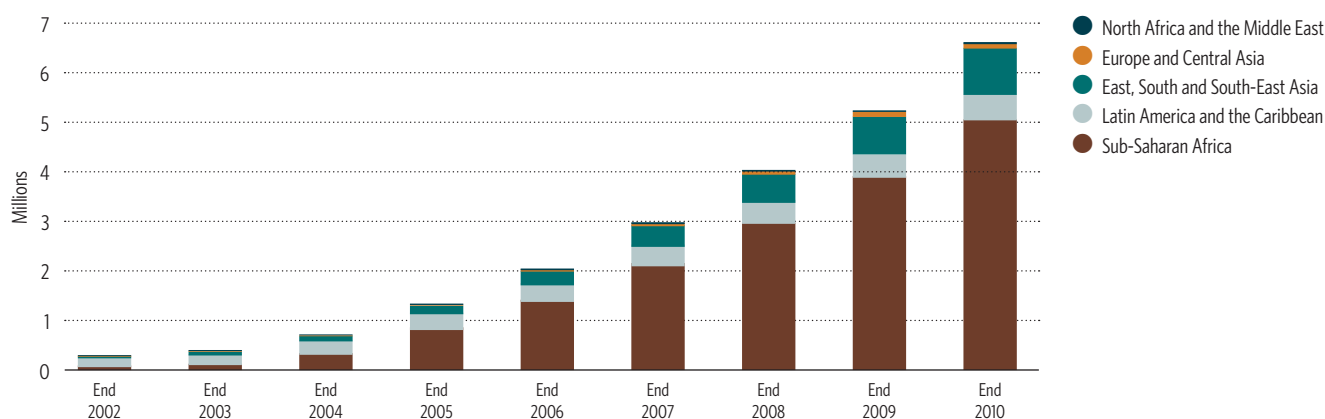
a See Box 5.9 for further information on the methods for estimating the need for and coverage of antiretroviral therapy in 2010.

b The 2009 figures may differ from those previously published because countries have submitted newly available data.

c All estimated needs have been developed according to 2010 WHO guidelines and criteria for initiating treatment.

d The coverage estimate is based on the unrounded estimated numbers of people receiving and needing antiretroviral therapy.

**Fig. 5.3** Number of people receiving antiretroviral therapy in low- and middle-income countries, by region, 2002–2010



income countries in 2010, most in sub-Saharan Africa (Table 5.4). Home to the greatest absolute number of people living with HIV, South Africa now provides antiretroviral therapy to a fifth of all the people receiving antiretroviral therapy in low- and middle-income countries. Zimbabwe recorded the highest rise in enrolment, with an increase of almost 50% in the number of people receiving treatment between December 2009 and December 2010. Despite continued progress, however, treatment in many of these countries remained well below the estimated needs.

At least 745 000 people are receiving antiretroviral therapy in high-income countries, including about 430 000 in Europe, 300 000 in North America and the Caribbean, and 16 700 in Asia, Oceania and the Middle East. At the end of 2010, the total number of people accessing antiretroviral therapy worldwide, including in high-income countries, was estimated to be about 7.4 million.

The Global Fund to Fight AIDS, Tuberculosis and Malaria and the United States President's Emergency Plan

for AIDS Relief remained the two major international sources of funding for antiretroviral therapy programmes in low- and middle-income countries in 2010. As of December 2010, Global Fund-supported programmes provided treatment to 3.0 million people, and programmes funded by the United States President's Emergency Plan for AIDS Relief supported antiretroviral therapy for 3.2 million people. About 1.5 million people were receiving treatment through programmes jointly funded by the two initiatives; hence, together they supported programmes that provided treatment to about 4.7 million people at the end of 2010 (45,46).

Coverage of antiretroviral therapy in low- and middle-income countries continued to increase in 2010 and reached 47% [44-50%] of the 14.2 million [13 400 000-15 000 000] people estimated to need it at the end of 2010 (Table 5.3).

As in previous years, Latin America and the Caribbean had the highest regional coverage level in 2010, at 63% [57-73%], because of the relatively longer duration

**Table 5.4 Twenty low- and middle-income countries with the highest number of people receiving antiretroviral therapy and their respective share of the total number of people receiving antiretroviral therapy in low- and middle-income countries as of December 2010**

Country	Reported number of people receiving antiretroviral therapy, 2009	Reported number of people receiving antiretroviral therapy, 2010	Estimated antiretroviral therapy coverage, 2010	Percentage increase between 2009 and 2010	Percentage of total people receiving antiretroviral therapy in low- and middle-income countries, 2010
South Africa	971 556	1 389 865	55% [52-58%]	43%	21%
Kenya	336 980	432 621	61% [56-66%]	28%	7%
India	330 300	424 802	... [30-38%] <sup>a</sup>	29%	6%
Nigeria	302 973	359 181	26% [24-28%]	19%	5%
Zambia	283 863	344 407	72% [67-77%]	21%	5%
Zimbabwe	218 589	326 241	59% [54-62%]	49%	5%
United Republic of Tanzania	199 413	258 069	42% [39-46%]	29%	4%
Malawi	198 846	250 987	... [49-57%] <sup>a</sup>	26%	4%
Uganda	200 413	248 222	47% [43-51%]	24%	4%
Thailand	216 118	236 808	67% [55-85%]	10%	4%
Ethiopia	176 632	222 723	... <sup>a</sup>	26%	3%
Mozambique	170 198	218 991	40% [36-46%]	29%	3%
Brazil	185 982	201 279	70% [65-75%]	8%	3%
Botswana	145 190	161 219	93% [89->95%]	11%	2%
Rwanda	76 726	91 984	88% [76->95%]	20%	1%
Cameroon	76 228	89 455	38% [34-43%]	17%	1%
Namibia	70 498	88 717	90% [78->95%]	26%	1%
China	65 481	86 122	32% [26-37%]	32%	1%
Russian Federation	75 900	79 430	... [21-29%] <sup>a</sup>	5%	1%
Lesotho	61 736	76 487	57% [53-60%]	24%	1%

<sup>a</sup> Estimates of the number of people needing antiretroviral therapy are currently being revised and will be adjusted, as appropriate, based on ongoing data collection and analysis. Therefore, coverage cannot be presented or only as a range.

of antiretroviral therapy programmes in some of the region's largest countries.

In sub-Saharan Africa, antiretroviral therapy coverage reached 49% [46–52%] in 2010. The region accounted for 73% of the estimated treatment need in low- and middle-income countries and 76% of the total number of people receiving treatment at the end of 2010. However, important intraregional differences in coverage were observed: whereas 56% [53–59%] of the people who needed antiretroviral therapy in eastern and southern Africa had access, in western and central Africa antiretroviral therapy coverage was only 30% [28–33%].

Coverage in 2010 improved across all other regions as well, but was lowest in East, South and South-East Asia, with 39% [36–44%], Europe and Central Asia, with 23% [20–26%] and North Africa and the Middle East, where only 10% [8–13%] of the regional antiretroviral

therapy needs were met. In these regions, many countries face HIV epidemics that are concentrated among key populations at higher risk for HIV infection, who often have relatively greater difficulty in accessing treatment and care services (section 6.4).

At the end of 2010, ten low- and middle-income countries, including three countries with generalized epidemics (Botswana, Namibia and Rwanda), four countries with concentrated epidemics (Cambodia, Chile, Guyana and Nicaragua) and three countries with low level epidemics (Croatia, Cuba and Slovakia), had already achieved universal access to antiretroviral therapy, commonly understood as providing antiretroviral therapy to at least 80% of the people who need it (Table 5.6). Seven countries (Argentina, Brazil, Dominican Republic, Mexico, Swaziland, Uruguay and Zambia) had near-universal coverage levels, between 70% and 79%, and 31 additional countries had coverage rates higher than 50%.

### Box 5.9

#### Methods for estimating the need for and coverage of antiretroviral therapy among adults

Antiretroviral therapy coverage measures the proportion of people receiving it, as reported by national programmes, in relation to the estimated number of people who need it. National HIV prevalence curves are used as a basis for calculating the numbers of people eligible for antiretroviral therapy. Several factors influence the number of adults eligible, including the CD4 count threshold at which antiretroviral therapy is deemed necessary. In 2010, WHO recommended that the threshold be changed from 200 cells per mm<sup>3</sup> to 350 cells per mm<sup>3</sup> (7) – substantially increasing the number of people eligible for antiretroviral therapy in low- and middle-income countries (47).

To capture these changes, Spectrum now tracks the number of adults living with HIV according to their CD4 count. This enables more precise estimates of the numbers of adults who are eligible for antiretroviral therapy and of the number of people dying from AIDS-related causes. With available new data on the distribution of the people living with HIV by CD4 count and annual declines in CD4 counts, it appears that progression from the time a person acquires HIV infection until he or she is eligible for treatment is slower than previously estimated. As a result, the estimates of the numbers adults eligible for antiretroviral therapy published in this report are lower than the estimates published in the 2010 universal access report (47).

Finally, the latest demographic dataset from the United Nations Population Division (48), incorporated in the 2011 model, has population estimates that are about 2% lower than previous estimates. Collectively, these changes have resulted in lower estimates for the number of adults eligible for antiretroviral therapy in 2009: 13.4 million [12 600 000–13 800 000] according to the 2009 model, versus 11.7 million [11 000 000–12 200 000] in the 2011 model.

Meanwhile, the estimated number of children who need antiretroviral therapy in 2009 was revised upwards, from 1 270 000 [830 000–1 700 000] to 1 670 000 [1 500 000–1 800 000] (see Box 7.19). Hence, the coverage rates published here should not be compared with coverage figures published in previous editions of this universal access report.

In 2010, according to the revised model, an estimated 2.02 million [1 800 000–2 300 000] children needed antiretroviral therapy.

**Table 5.5** Estimated number of adults and children who need antiretroviral therapy in 2009 and 2010, per model year

	2009 model	2011 model	
	2009	2009	2010
Estimated number of adults who need antiretroviral therapy	13 400 000 [12 600 000–13 800 000]	11 700 000 [11 000 000–12 200 000]	12 300 000 [11 600 000–12 800 000]
Estimated number of children who need antiretroviral therapy	1 270 000 [830 000–1 700 000]	1 670 000 [1 500 000–1 800 000]	2 020 000 [1 800 000–2 300 000]



**Table 5.6** Low- and middle-income countries with estimated antiretroviral therapy coverage levels of 50–69%, 70–79% and 80% or higher as of December 2010<sup>a</sup>

Antiretroviral therapy coverage			
50–69% (31 countries)		70–79% (7 countries)	80% or higher (10 countries)
Belarus	Lesotho	Argentina	Botswana
Belize	Malawi	Brazil	Cambodia
Benin	Papua New Guinea	Dominican Republic	Chile
Costa Rica	Paraguay	Mexico	Croatia <sup>b</sup>
Ecuador	Peru	Swaziland	Cuba
El Salvador	Philippines	Uruguay	Guyana
Ethiopia	Romania	Zambia	Namibia
Gabon	Senegal		Nicaragua
Georgia	South Africa		Rwanda
Guatemala	Thailand		Slovakia <sup>b</sup>
Guinea	Togo		
Haiti	Turkey		
Honduras	Venezuela (Bolivarian Republic of)		
Jamaica	Viet Nam		
Kenya	Zimbabwe		
Lao People's Democratic Republic			

a Countries with less than 100 people who need antiretroviral therapy are not included in the table.

b Countries with an estimated antiretroviral therapy need of less than 1000 people. The data for these countries should be interpreted cautiously because of how ranges of uncertainty affect the estimates.

### Box 5.10

#### Scaling up services in Rwanda

Rwanda has a generalized HIV epidemic, with an estimated prevalence of HIV infection of 3% in the general population and 4% among pregnant women (49). With a gross national income per person of US\$ 520 in 2010, it is considered a low-income country according to the World Bank (50). Despite the political and economic upheaval that destroyed most of the country's health infrastructure in the 1990s, Rwanda has made great strides in expanding access to the continuum of HIV interventions, including testing and counselling, treating adults and children and preventing the mother-to-child transmission of HIV.

The national response, coordinated at the central level by the National AIDS Control Commission, is characterized by a multisectoral, multidisciplinary, decentralized and community-based approach. Each of the country's 30 districts has a District AIDS Control Committee, and all implementing agencies have a clear division of labour to ensure accountability and avoid duplication of work. People living with HIV are also involved in several HIV-related activities, especially through peer educator programmes in which people living with HIV help to sensitize their family members for HIV testing and adherence to treatment. Peer educators also serve as liaisons between health centres and antiretroviral therapy sites and people living with HIV, thus facilitating the follow-up of those defaulting treatment. Associations of people living with HIV have also received financial support from the government and development partners to start income-generating activities.

Considerable progress has been made in increasing the uptake of HIV testing and counselling among the general population. By 2010, 434 sites offered voluntary counselling and testing versus only 44 in 2003. The number of HIV tests performed has also steadily increased through information, education and behavioural change campaigns, reaching 1 863 000 in 2010, a four-fold increase from the 472 000 recorded in 2006 (49).

Coverage of antiretroviral therapy has significantly increased as well. The number of people receiving antiretroviral therapy was only 870 in 2002, grew to 34 000 in 2006 and reached 92 000 in 2010. Between 2008 and 2010, at least 1000 new adults started antiretroviral therapy every month. As of December 2010, 96% [85–95%] of adults and 45% [36–53%] of children eligible for antiretroviral therapy were receiving it.<sup>1</sup> The percentage of health facilities offering antiretroviral therapy reached 64% (328 of 512) in 2010, up from 38% (133 of 354) in 2006. According to the National Strategic Plan 2009–2012, all health facilities should be able to offer antiretroviral therapy services by 2012, and 90% of eligible adults and children should have access to antiretroviral therapy.

Considerable investment has been made in scaling up services for preventing the mother-to-child transmission of HIV. The national programme was established in 2001, and its services have been gradually integrated into existing maternal and child services. In 2010, 68% of all expected pregnant women were tested for HIV. Sixty-seven per cent of the estimated number of pregnant women living with HIV received antiretroviral drugs to prevent mother-to-child transmission in 2010.<sup>2</sup> In November 2010, Rwanda recommended that all pregnant women living with HIV receive triple-antiretroviral prophylaxis starting as soon as possible during pregnancy based on standard eligibility criteria and continuing during the entire breastfeeding period up to 18 months of age. The introduction and scale up of early infant diagnosis of HIV using PCR is effective in all sites with services for preventing mother-to-child transmission, and links between preventing mother-to-child transmission, antiretroviral therapy and family planning services are being strengthened. The programme aims to reduce vertical transmission rates below 2% by 2012.

<sup>1</sup> These coverage estimates were developed using standardized Spectrum estimates (see Box 5.9 for estimates for adults and Box 7.19 for estimates for children).

<sup>2</sup> In 2010, 10% of pregnant women received single-dose nevirapine.

## Box 5.11

### Achieving universal access to antiretroviral therapy in Cambodia

Cambodia has an estimated population of 13.8 million (2010), and epidemiological data show that the country's HIV epidemic is concentrated and has particularly affected sex workers, people who inject drugs and men who have sex with men. According to the most recent estimates, about 63 000 people were living with HIV in the country in 2009.

Despite a fragile health care system debilitated by decades of civil war and despite being a low-income country (annual gross national income per person of US\$ 710 (51)), Cambodia has been able to implement a comprehensive and effective national HIV response. The prevalence of HIV infection has declined from an estimated 2.0% among people 15–49 years old in 1998 to a projected 0.7% in 2010, and it has been able to achieve universal access targets for antiretroviral therapy, with close to 43 000 people receiving antiretroviral therapy, or 92% of adults and children who need it (Table 5.7). Cambodia has achieved this by leveraging high-level political support to develop an evidence-informed, integrated and decentralized national response.

**Table 5.7 Selected national indicators of HIV care and treatment, Cambodia, 2010**

Number of people receiving antiretroviral therapy	43 000 (39 000 adults and 4 000 children)
% of people on antiretroviral therapy among those who need it	92% [68%→95%]
Adults alive and receiving antiretroviral therapy at 12, 24 and 60 months	86% (12 months), 84% (24 months) and 78% (60 months)
Median CD4 count at pre-antiretroviral therapy enrolment	197 per mm <sup>3</sup>
% newly registered in pre-antiretroviral therapy care screened for TB	64%
% of pregnant women who were tested for HIV and received the test result	57%

Antiretroviral therapy was introduced on a small scale in 2001, but rapid scale-up was hampered by the uncoordinated efforts of multiple actors, limited capacity and poor infrastructure of local health facilities and a high level of stigma and discrimination against people living with HIV. To address these constraints and create a comprehensive and sustainable national antiretroviral therapy programme, the National Center for HIV/AIDS, Dermatology and STD (NCHADS) led the establishment of the Continuum of Care Framework in 2003, based on district-level services that emphasized teamwork, community links, including through home-based care, and a public health approach to service delivery.

HIV health services were progressively expanded in a coordinated way to cover most of the country's operational districts. In 2008, NCHADS and the National Maternal and Child Health Center introduced a collaborative strategy called the "Linked Response", which provided a comprehensive approach to preventing mother-to-child transmission, including HIV testing and counselling at the health centre level. Similarly, NCHADS and the National Center for Tuberculosis and Leprosy Control accelerated TB and HIV collaborative activities, including HIV testing and counselling for people with TB in health centers and the three I's for HIV and TB (section 5.4.2) at the operational district level.

National policies have also been put in place to provide a continuum of prevention to care and treatment services for key populations at higher risk of HIV infection, including sex workers, men who have sex with men and people who inject drugs. Access to health services has been improved by enhancing links and referral mechanisms between community outreach programmes and HIV testing and counselling, HIV care and treatment and sexual and reproductive health services.

Attention is also given to measuring and improving the quality of the HIV care and treatment programme. Coordination meetings are held regularly, mentoring is provided to district and health centre staff and national and regional network meetings for clinicians and counsellors facilitate the exchange of experiences and best practices. A strategy for tackling HIV drug resistance has been adopted, including monitoring for early-warning indicators, and a strategy for continuous quality improvement is currently being rolled out. Each operational district is supported in collecting indicators that measure the quality of management of health service users across the continuum of care and to implement appropriate corrective measures.

### 5.3.2 Access to antiretroviral therapy among women and children

A total of 136 low- and middle-income countries reported data disaggregated for adults and children. About 456 000 children 0–14 years old were receiving antiretroviral therapy at the end of 2010, up from 354 600 at the end of 2009, a 29% increase from 2009 (Chapter 7 provides an in-depth analysis of treatment of and policy on children living with HIV).

Overall antiretroviral therapy coverage among children was lower than among adults in low- and middle-income countries. Children represented 7% of the people receiving antiretroviral therapy and 14% of the people who needed it. Of the 2 020 000 [1 800 000–2 300 000] children estimated to need antiretroviral therapy, only 23% [20–25%] had access to treatment versus 51% of adults [48–54%].<sup>1</sup> One of the main reasons is that sub-Saharan Africa accounts for 91% of the children who need treatment but has an estimated coverage rate of about 21% (Table 5.8). Indeed, only in Europe and

Central Asia is the coverage among children higher than among adults, a fact that may be partly explained by the scale up of services for preventing mother-to-child HIV transmission in the region and robust links with treatment and care services.

Data disaggregated by sex on the number of people receiving and needing antiretroviral therapy are available from 109 low- and middle-income countries, representing 95% of the 6.65 million people receiving treatment in 2010.<sup>2</sup> Women represented 58% of the people receiving antiretroviral therapy and 51% of those who need it. Overall, antiretroviral therapy coverage was higher among women, estimated at 53%, versus 40% among men. However, this pattern does not apply to all regions (Table 5.9). Women are especially advantaged compared with men in East, South and South-East Asia and in sub-Saharan Africa. In contrast, in Latin America and Caribbean, coverage of antiretroviral therapy is higher among men than women.

1 The coverage rates observed in 2010 decreased compared with 2009 because the estimated number of children who need antiretroviral therapy increased (see box 7.19).

2 Some countries provided disaggregated data only for a proportion of the people receiving antiretroviral therapy in the country. For the countries with incomplete data sets, treatment data by sex were obtained by applying male–female ratios from existing data to the total numbers of people receiving treatment. Similarly, for seven countries that could supply data by sex in 2008 or 2009 but not in 2010, the available male–female ratios from 2008 or 2009 were applied to the 2010 data.

**Table 5.8** Number of children 0–14 years old receiving and estimated to need antiretroviral therapy and percentage coverage among children and adults in low- and middle-income countries, by region, December 2010<sup>a</sup>

Geographical region	Number of children receiving antiretroviral therapy, December 2010	Estimated number of children needing antiretroviral therapy, 2010 [range]	Antiretroviral therapy coverage among children, December 2010 [range] <sup>b</sup>	Antiretroviral therapy coverage among adults, December 2010 [range] <sup>b</sup>
Sub-Saharan Africa	387 500	1 840 000 [1 600 000–2 100 000]	21% [19–24%]	55% [52–58%]
Eastern and southern Africa	337 200	1 290 000 [1 100 000–1 400 000]	26% [23–29%]	62% [59–65%]
Western and central Africa	50 200	550 000 [480 000–630 000]	9% [8–11%]	35% [33–38%]
Latin America and the Caribbean	16 300	41 400 [34 000–50 000]	39% [32–48%]	64% [58–74%]
Latin America	13 600	30 600 [25 000–38 000]	44% [36–55%]	65% [58–75%]
Caribbean	2 700	10 800 [8 700–13 000]	25% [21–31%]	64% [57–70%]
East, South and South-East Asia	43 800	113 000 [84 000–140 000]	39% [30–52%]	39% [37–43%]
Europe and Central Asia	7 500	11 400 [10 000–13 000]	65% [55–71%]	22% [19–25%]
North Africa and the Middle East	840	18 500 [12 000–25 000]	5% [3–7%]	10% [8–14%]
<b>All low- and middle-income countries</b>	<b>456 000</b>	<b>2 020 000</b> <b>[1 800 000–2 300 000]</b>	<b>23%</b> <b>[20–25%]</b>	<b>51%</b> <b>[48–54%]</b>

Note: some numbers do not add up because of rounding.

a For an explanation of the methods used, see the explanatory notes for Annex 4 and 5, and Box 5.9.

b The coverage estimate is based on the unrounded numbers of people receiving and needing antiretroviral therapy.

**Table 5.9** Comparison of estimated antiretroviral therapy coverage levels among men and women, in low- and middle-income countries by region, December 2010

Geographical region (number of countries reporting/total countries in region)	Men			Women		
	Coverage <sup>a</sup>	Number receiving antiretroviral therapy	Estimated number who need it	Coverage <sup>a</sup>	Number receiving antiretroviral therapy	Estimated number who need it
Sub-Saharan Africa (44/46)	41%	1 751 900	4 300 000	55%	3 060 100	5 600 000
Eastern and southern Africa (20/22)	48%	1 467 400	3 100 000	62%	2 503 300	4 000 000
Western and central Africa (24/24)	23%	284 500	1 200 000	35%	556 800	1 600 000
Latin America and the Caribbean (20/29)	64%	322 900	500 000	62%	177 600	280 000
Latin America (16/20)	64%	292 800	455 000	64%	147 800	230 000
Caribbean (4/9)	64%	30 100	47 000	56%	29 800	53 000
East, South and South-East Asia (20/34)	34%	521 800	1 600 000	48%	399 700	830 000
Europe and Central Asia (18/26)	20%	27 100	140 000	20%	20 600	100 000
North Africa and the Middle East (7/14)	9%	7 600	86 000	9%	5 600	61 000
<b>Total (109/149)</b>	<b>40%</b>	<b>2 631 300</b>	<b>6 600 000</b>	<b>53%</b>	<b>3 663 500</b>	<b>6 900 000</b>

a The coverage estimate is based on the unrounded numbers of people receiving and needing antiretroviral therapy.

### 5.3.3. Availability of antiretroviral therapy

The number and distribution of health facilities providing antiretroviral therapy are important indicators of the scaling up of and access to treatment services. In 2010, 128 low- and middle-income countries reported a total of 22 369 health facilities providing antiretroviral therapy. Of these facilities, 78% were in the public sector and 8% in the private sector (14% were unspecified).

A total of 109 countries provided data for both 2009 and 2010. In these countries, the reported number of health facilities providing antiretroviral therapy

increased from 18 386 to 21 641, or an 18% increase in one year. It increased by 22% in sub-Saharan Africa (from 8462 to 10 359 in 39 countries); 10% in Latin America and the Caribbean (from 2759 to 3048 in 24 countries); 12% in East, South and South-East Asia (from 6015 to 6741 in 21 countries) and 33% in Europe and Central Asia (from 1033 to 1369 in 17 countries). In North Africa and the Middle East, the number of facilities providing antiretroviral therapy increased from 117 in 2009 to 124 in 2010 across 8 reporting countries, an increase of 6%.

The average number of people receiving antiretroviral therapy per health facility in the subset of 109 countries

**Table 5.10** Number of facilities providing antiretroviral therapy in 2009 and 2010, countries reporting in both years

Geographical region	Number of countries reporting in both 2009 and 2010	Number of antiretroviral therapy facilities in 2010	Number of antiretroviral therapy facilities in 2009	Increase from 2009 to 2010 (%)	Average number of people receiving antiretroviral therapy per health facility
Sub-Saharan Africa	39	10 359	8 462	22%	484
Latin America and the Caribbean	24	3 048	2 759	10%	153
East, South and South-East Asia	20	6 741	6 015	12%	132
Europe and Central Asia	17	1 369	1 033	33%	34
North Africa and the Middle East	8	124	117	6%	66
<b>Total</b>	<b>109</b>	<b>21 641</b>	<b>18 386</b>	<b>18%</b>	<b>297</b>

reporting data in both years increased from 277 in 2009 to 297 in 2010. The average figure in sub-Saharan Africa is substantially higher than in the rest of the world, with 484 people receiving antiretroviral therapy per health facility versus 457 in 2009. Although sites cannot be directly compared across regions because of their different structures, it is necessary to ensure facilities are adequately distributed, staffed and equipped to cope with growing cohorts, as the workload of health care providers can significantly influence the quality of service delivery.

### 5.3.4 Outcomes at the programme level: retention on antiretroviral therapy

Adequately measuring retention on antiretroviral therapy (the proportion of people started on lifelong antiretroviral therapy who survive and continue it over time) is paramount to monitor the quality of service delivery and ensure the long-term success of antiretroviral therapy programmes. However, gaining a

broader perspective of the effectiveness of national care programmes also requires reinforcing the monitoring of the people living with HIV throughout the continuum of care, especially those enrolled in care but not yet receiving antiretroviral therapy.

Although limited country data are available on retention rates throughout the cascade of interventions, a recent analysis has shown very low rates of retention between testing and treatment initiation for people living with HIV (Box 4.3). In Viet Nam, the comparison of cumulative cases reported for HIV case-reporting and enrolment in HIV care and antiretroviral therapy identified major gaps between services, leading to the implementation of changes in programme management (Box 5.12).

In December 2010, 92 low- and middle-income countries provided data on retention at 12 months, a decrease from the 115 that reported retention data as

#### Box 5.12

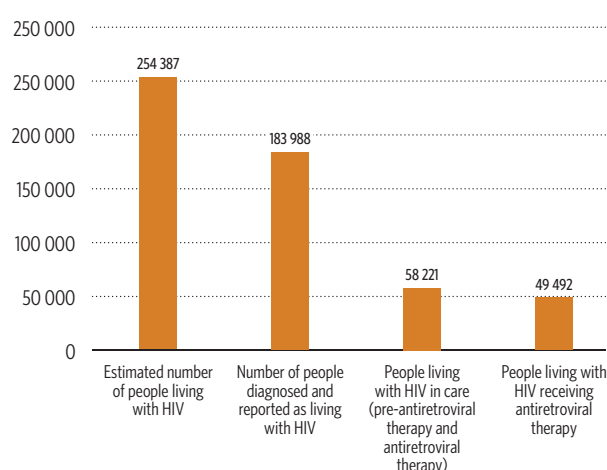
#### Strengthening the continuum of prevention and care to promote retention in HIV services in Viet Nam

Viet Nam has made considerable progress in rapidly scaling up access to prevention, treatment and care services. As of December 2010, 49 492 people were receiving antiretroviral therapy, an 18-fold increase since December 2005. Nevertheless, an analysis of HIV case reporting and care and treatment data showed that many people who tested HIV-positive were not enrolled in care and did not initiate antiretroviral therapy (Fig. 5.4). To address these gaps, the Viet Nam Authority of HIV/AIDS Control has been working to strengthen the continuum of services across diagnosis, care and treatment retention and bolster links between HIV care sites and other health and community services.

Greater community involvement has been actively encouraged to expand coverage of HIV prevention and to promote early HIV testing. In many sites, people living with HIV also work as peers assisting other people in navigating the various steps from HIV diagnosis to enrolment in HIV care outpatient clinics. With the development of national guidelines on home-based care in 2010, community teams have been trained to support retention in care and adherence to antiretroviral therapy.

In some districts, results can already be observed. Tu Liem and Dong Anh District Health Centers (Hanoi) have promoted collaborative activities with peer educators and integrated services (e.g. with TB services, methadone maintenance therapy), and the rate of retention on antiretroviral therapy at 12 months now exceeds 90%. In Tan Chau District Health Center (An Giang), where substantial investment has been made to strengthen the follow-up of people living with HIV through home-based care teams, the antiretroviral therapy retention rate improved from 66% to 85% between 2009 and 2010, and the percentage keeping appointments increased from 76% to 86% in the same period.

**Fig. 5.4 Cascade of HIV diagnosis, care and treatment in Viet Nam in 2010**



Sources: The number of people living with HIV was estimated by using EPP and Spectrum. The number of people diagnosed and reported as living with HIV is from the national case reporting system. The data on people in care and receiving antiretroviral therapy are from national routine reporting systems of the Viet Nam Authority of HIV/AIDS Control, Ministry of Health. Case-reporting data may include instances of double-counting.

of December 2009. However, the number of people assessed at each 12-month interval slightly increased. The number of countries reporting data on retention at 24 months also increased from 2009 to 2010, as did the number of people assessed (Table 5.11).

The data reported for each time-point were aggregated to produce regional and global estimates. Data on the proportion of people retained on antiretroviral therapy over time continue to show that most attrition occurs within the first year. Attrition continues with longer follow-up but not at the level observed during the first year of treatment. In 2010, the average global retention rate at 12 months was 81% (interquartile range: 75–90%), dropping to 75% (interquartile range: 69–88%) at 24 months and to 67% (interquartile range: 59–83%) at 60 months. Importantly, the reported retention trends in 2010 were in the range of those observed in 2008 (52) and 2009 (53). Nevertheless, the reported retention rates varied importantly across

countries, especially at five years (Fig. 5.5). Although the actual underlying attrition may explain some of

### Box 5.13

#### Monitoring the continuum of care and improving data quality

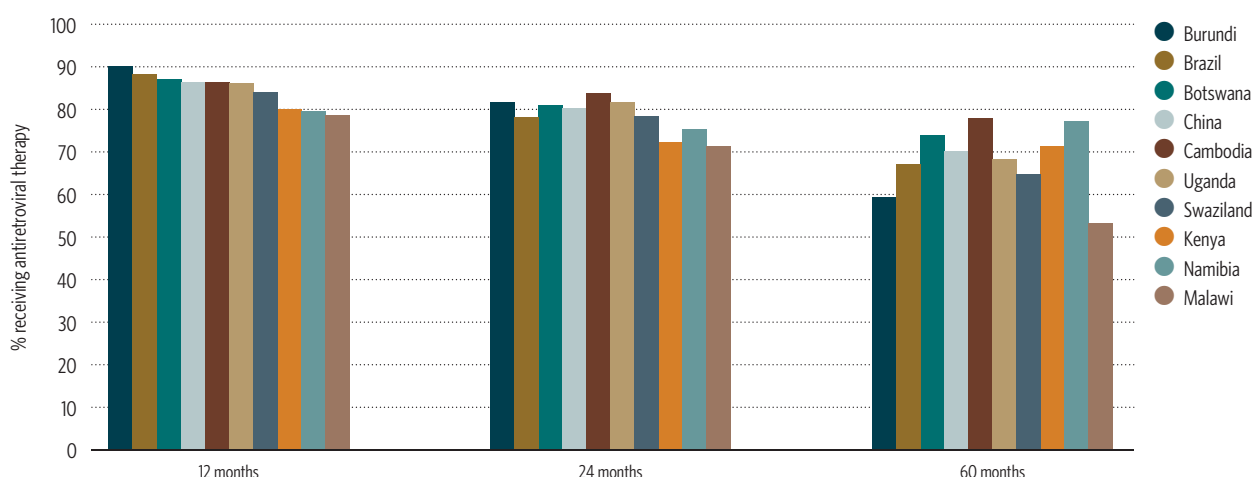
With the scaling up of antiretroviral therapy, considerable investment has been made to improve the monitoring of cohorts of people initiating antiretroviral therapy, including retention rates (Table 5.11). However, reported programme data are still incomplete, and associated outcomes may be subject to biases (52,54). Importantly, few countries are able to produce consistent data on the full national cohort of people initiating antiretroviral therapy and for the most recent calendar period. For 2010, only Ethiopia and Malawi, among countries with a high prevalence of HIV, were able to produce estimates of antiretroviral therapy retention at 12 months based on data for over 90% of the people who started during 2009. Thus, the reported data may not be representative of national programmes.

**Table 5.11** Number of countries reporting on retention on antiretroviral therapy at 12, 24 and 60 months among 149 low- and middle- income countries, 2008, 2009 and 2010

	2008		2009		2010	
	Number of countries reporting	Number of people assessed	Number of countries reporting	Number of people assessed	Number of countries reporting	Number of people assessed
Retention at 12 months	61	297 408	115	519 890	92	630 535
Retention at 24 months	42	132 427	66	284 017	73	297 239
Retention at 60 months	NA	NA	NA	NA	46	92 477

NA: not asked.

**Fig. 5.5** Retention rates for antiretroviral therapy at 12, 24 and 60 months for selected countries



The selected countries represent 91% of the people for whom retention data at 60 months is available. The results may not be linear over time, since outcomes at 12, 24 and 60 months are measured based on different cohorts according to the year antiretroviral therapy is initiated.

this variation, some may be related to deficiencies in information and systems tracking follow-up (Box 5.13). A total of 50 countries reported disaggregated retention data at 12 months by sex, and 47 countries provided similarly disaggregated data by age (children 0–14 years old and people 15 years and older). Globally, retention at 12 months is similar among women and men, averaging 84% in both cases in the 50 reporting countries. The average retention rate at 12 months is 80% among children and 82% among adolescents and adults. The retention rate among children improved compared with the data reported in 2009, when it was 73%.

Few countries are able to provide detailed information on the reasons for discontinuing antiretroviral therapy (such as death, stopping treatment or loss to follow-up). Only 41 (45% of those reporting) and 32 (70% of those reporting) countries, respectively, provided detailed data on retention at 12 and 60 months. Countries that are able to report at 60 months may have better cohort monitoring and outcome tracking systems. For both periods, loss to follow-up accounted for more than half of the people discontinuing treatment. Nevertheless, the people lost to follow-up may be in a variety of different circumstances; some have died and others have been transferred to another site to continue treatment but have not been properly registered and tracked. The causes of such high rates of loss to follow-up therefore cannot be precisely ascertained.

High retention rates are essential to maximize the long-term health benefits of treatment and to ensure the sustainability of programmes, and greater investment is needed to continually support them. Timely presentation for initiating treatment is fundamental to reduce the number of people dying soon after starting antiretroviral therapy (55). Programmatic factors such as site capacity and increasing workload because of growing loads of people receiving treatment may become more prominent in time if systems are not adapted to cope with increased demand. Indeed, recent studies from South Africa have found higher risks of loss to follow-up among people initiating antiretroviral therapy in more recent calendar years compared with previous years (56,57), a finding in part related to the considerable strain on health services because of rapid scale-up.

Effective and simplified cohort monitoring systems are critical to support the adequate scale-up of other essential interventions as well, such as prevention of and care for opportunistic infections (including TB), nutritional support, pharmacovigilance, drug resistance and adherence. Given the growing workload associated with gathering and processing information on more indicators for a greater number of people, novel approaches for generating data may need to be developed to protect the robustness and sustainability of national health information systems (58).

### **5.3.5 Preventing and assessing HIV drug resistance**

As access to antiretroviral therapy expands, HIV drug resistance inevitably emerges because of HIV's high mutation rate, viral recombination and the need for sustained, lifelong treatment. To improve the surveillance of HIV drug resistance with standardized approaches, WHO, in collaboration with the WHO HIVResNet, the Global HIV Drug Resistance Network, has developed a global strategy for preventing and assessing HIV drug resistance based on three key elements: (1) routine monitoring of early-warning indicators of HIV drug resistance, (2) surveys to assess acquired HIV drug resistance and associated programmatic factors among populations receiving antiretroviral therapy and (3) surveys to classify transmitted HIV drug resistance in populations recently infected with HIV (59). As of mid-2011, more than 60 countries had implemented one or more elements of the strategy for preventing and assessing HIV drug resistance (60). To facilitate the implementation of country plans, WHO supports the accreditation of national, regional and specialized laboratories for testing HIV drug resistance. As of mid-2011, 27 testing laboratories for HIV drug resistance had been accredited.

#### **5.3.5.1 HIV drug resistance – early-warning indicators**

Research shows that various programme and site factors are closely associated with the emergence of HIV drug resistance, and proper monitoring can serve as early-warning indicators to support appropriate management of programmes. WHO has identified eight early-warning indicators for HIV drug resistance, each with an associated recommended target, and recommends monitoring them annually in all or many representative sites (Box 5.14) (61,62). WHO suggests

**Box 5.14****List of early-warning indicators and associated recommended targets**

Early-warning indicator	Target (%)
1. % of initial antiretroviral therapy prescriptions congruent with national or WHO guidelines	100
2. % of people receiving antiretroviral therapy lost to follow-up at 12 months	≤20
3. % of people receiving antiretroviral therapy retained on first-line antiretroviral therapy at 12 months	≥70
4. % of people receiving antiretroviral therapy with 100% on-time drug pick-ups during the first 12 months of antiretroviral therapy or during a specified time period	≥90
5. % of people receiving antiretroviral therapy who attended all appointments on time during the first 12 months of antiretroviral therapy or during a specified time period	≥80
6. % continuity of antiretroviral drug supply during a 12-month period	100
7. % of people receiving antiretroviral therapy adhering to antiretroviral therapy by pill count or other standardized measure	≥90
8. % of people receiving antiretroviral therapy with a viral load <1000 copies/ml at 12 months	≥70

**Box 5.15****Proportion of monitored clinics achieving WHO-recommended early-warning indicator targets, by indicator and region, 2004-2009**

The percentage of adult clinics meeting WHO-recommended targets varies considerably by early-warning indicator and region. Whereas most participating clinics in Africa and Asia met the target for early-warning indicator 1 (appropriate first-line prescribing practices), only 46% of monitored clinics in Latin America and the Caribbean achieved recommended levels. Globally, 69% clinics monitored met the targets for the second early-warning indicator (loss to follow-up) and 67% for the third early-warning indicator (retention on first-line antiretroviral therapy). Only 17% of clinics monitored achieved early-warning indicator 4 target of providing at least 90% of people receiving antiretroviral therapy with 100% on-time drug pick-up. Fifty-eight per cent of clinics achieved WHO's recommended level for early-warning indicator 5 (keeping appointments on time), and 65% provided a continuous supply of antiretroviral drugs during a 12-month period (early-warning indicator 6). Limited data are available on early-warning indicators 7 and 8. Overall, early-warning indicators results raise important concerns, since the targets were not achieved in many countries. These data support the urgent need for strengthening the monitoring of antiretroviral therapy programmes and support for improving adherence and retention in antiretroviral therapy, robust tracing of defaulters and preventing drug stock-outs.

that national antiretroviral therapy programmes monitor early-warning indicators for HIV drug resistance that are feasible based on routinely available data.

As of mid-2011, 50 countries monitored one or more early-warning indicators based on available routinely collected data, covering 132 000 people initiating antiretroviral therapy during 2004–2009 at 2107 antiretroviral therapy clinics.

Many countries have used the results from monitoring early-warning indicators to improve management (63–65). Based on high rates of loss to follow-up, missed appointments or failure to pick up antiretroviral drugs on time, countries have worked to improve the mechanisms for tracing people receiving treatment. In Namibia, for instance, the Ministry of Health and Social Services, which identified migrant workers as being at risk of interrupting treatment, has planned to intensify existing systems for tracing discontinuation by improving its electronic record-keeping system, establishing a national patient database with unique identifiers and increasing the mobilization and redistribution of human resources (66).

**5.3.5.2 Surveys to assess acquired HIV drug resistance and associated programmatic factors**

Standardized surveys performed at sentinel clinics providing antiretroviral therapy to adults or children are important instruments for assessing the emergence and prevention of HIV drug resistance in populations receiving first-line antiretroviral therapy (67). Surveys to monitor HIV drug resistance identify factors that can be addressed by making adjustments at the site or programme level to minimize the emergence of preventable drug resistance. The results of surveys performed regularly at representative sites can strengthen the available evidence base for optimizing the selection of national antiretroviral therapy regimens. As of mid-2011, 51 surveys of acquired HIV drug resistance had been implemented in 13 countries (in Africa and South and South-East Asia). In an aggregate analysis of 15 surveys from 5 countries, 6% of 2150 people initiating first-line antiretroviral therapy had any baseline HIV drug resistance. After 12 months of antiretroviral therapy, 10% had viral failure (viral load greater than 1000 copies per ml). Among these, 69% had detectable HIV drug resistance. Among people living with HIV for which first-line treatment failed, with drug-resistant virus at 12 months, 96% were



predicted to achieve viral suppression with currently recommended second-line regimens (68).

### 5.3.5.3 Surveys to classify transmitted HIV drug resistance

A survey method has been developed to classify transmitted HIV drug resistance in populations likely to have been recently infected with HIV. The method's eligibility criteria for selecting sites and individuals were designed to minimize the inclusion of antiretroviral therapy-experienced individuals and/or chronically infected individuals and defines three categories of transmitted HIV drug resistance: low (under 5%), moderate (5-15%) and high (>15%) (69). The results of these surveys, combined with results from other key assessments, provide critical information relevant to preventing drug resistance.

As of mid-2011, 53 surveys to assess transmitted HIV drug resistance had been completed in 22 countries: 83% of surveys showed low transmitted drug resistance and 17% moderate resistance. The overall prevalence of transmitted HIV drug resistance was 3.7% [95% confidence interval (3.0-4.4%)]. Notably, 5 of the 11 surveys of transmitted HIV drug resistance conducted in 2009 showed moderate transmitted HIV drug resistance (11). Although additional studies are necessary to reliably perform trend analysis, other groups (70-73) have observed increasing rates of transmitted HIV drug resistance. Surveys should be repeated to confirm findings and investigations into antiretroviral therapy programme factors favouring the emergence and transmission of drug-resistant virus. Nevertheless, moderate levels of transmitted HIV drug resistance in specific populations merit attention, and strategies must be designed and implemented with urgency to mitigate them.

As antiretroviral therapy continues to be scaled up rapidly, programmatic assessments, informed by surveillance of transmitted and acquired HIV drug resistance, must be regularly performed to timely and adequately adapt policy and implementation practices. Increased funding and adequate infrastructure are needed to support ongoing surveillance of HIV drug resistance as well as increased efforts to further optimize care and treatment of people living with HIV, an essential element to minimize the emergence of HIV drug resistance (74).

### 5.3.6 Supplies of drugs for antiretroviral

#### therapy

Drug stock-outs remain an issue of concern in low- and middle-income countries. The number of countries providing data on the occurrence of stock-outs increased from 98 in 2009 to 118 in 2010. The proportion of countries experiencing stock-outs of drugs for antiretroviral drugs remained stable in 2010 compared with previous years. Of the 118 countries reporting information for 2010, 45 (38%) reported at least one episode of stock-out of antiretroviral drugs in health facilities in 2010 versus 37 of 98 countries (38%) in 2009 and 36 of 97 countries (37%) in 2008. The most severely affected regions were the African Region and the Region of the Americas, where 50% and 52%, respectively, of responding countries reported having experienced stock-outs of one or more antiretroviral drugs in 2011. The least severely affected regions were the South-East Asia Region and Western Pacific Region, where 25% and 23%, respectively, of responding countries reported having experienced stock-out episodes in 2011. In a subset of 87 countries providing comparable data in both 2009 and 2010, the number of countries experiencing stock-outs of antiretroviral drugs decreased from 34 (39%) to 32 (37%).

Ensuring an uninterrupted supply of antiretroviral drugs is critical to protect the health and well-being of people living with HIV, minimize the emergence of HIV drug resistance, support retention and ultimately reach universal access goals. As such, greater coordinated efforts must be made to identify and address bottlenecks in drug procurement and management. Several strategies have been deployed at the country and global levels to minimize the risk of treatment interruptions. For instance, procurement and supply managers in Thailand reported that they borrowed missing medicines from nearby health facilities; in Mali and Serbia, missing formulations were replaced by suitable alternatives. These experiences suggest that robust and affordable triple fixed-dose formulations could improve the reliability of supply systems, in particular in settings where single formulations are primarily responsible for stock-outs and potential treatment interruption.

Globally, the Coordinated Procurement Planning Initiative is fostering the coordination and sharing of information on stock levels among national and international partners. Through a coordinated alert and response mechanism, Coordinated Procurement Planning partners can indicate alternative sources

### Box 5.16

#### Using early-warning indicators to prevent stock-outs in Zimbabwe

After extensive consultations at the country, regional and global levels, WHO published in 2011 a set of harmonized monitoring and evaluation indicators for procurement and supply management systems (75). It contains 12 key indicators to monitor the performance of supply chain management systems, six of which are considered as early-warning indicators to prevent stock-outs and overstocking of antiretroviral, antituberculosis and antimalarial medicines. In order to identify best practices to support the implementation of monitoring and evaluation systems for procurement and supply management, pilot tests were conducted in Burkina Faso, Burundi, Cameroon, Côte d'Ivoire, Guinea, Mozambique, Uganda, United Republic of Tanzania and Zimbabwe.

In the Ministry of Health and Child Welfare (MOHCW) in Zimbabwe, after a period of field-testing, a monitoring plan was adopted and relevant data sources were identified. To leverage and strengthen existing systems, procurement and supply management indicators were integrated into the routine mechanisms for collecting and analysing data on the country's antiretroviral management programme.

From the beginning of January 2010, indicator results were reviewed at monthly stakeholder meetings which guided the design of strategies to address identified shortcomings, including:

- implementing specific training workshops to address data quality issues and to ensure that at least two managers at every facility had been trained in procurement and supply management;
- pre-emptively adjusting buffer stock levels and placing orders before reaching critically low levels, which exposed them to higher stock-outs risks;
- piloting mobile phone solutions to minimize delays in transferring data from peripheral levels in the Ministry of Health and Child Welfare to central-level for aggregation;
- putting plans in place to introduce computerized dispensing software in high-volume facilities to ensure adequate logistic infrastructure; and
- restructuring central warehouses through decentralisation of warehousing of antiretrovirals to ensure timely order processing and reduce lead time.

As a result of corrective actions, the rate of stock-outs for adult first-line antiretroviral medicines fell consistently, resulting in no facilities reporting any stock-out of first-line regimens between February and December 2010.

The roll-out of procurement and supply management indicators highlighted areas with high system performance (such as 100% of products ordered by all partners meeting national standard treatment guidelines and 100% of product batches meeting quality control tests), areas in which even lower targets could be pursued (such as lowering the target for the rate of product loss from 2% to 1%), and areas where continued effort was necessary (such as antiretroviral drugs for children, antiretroviral drug use, etc.). Coordination of all stakeholders and leadership by the Ministry of Health and Child Welfare in the procurement and supply management system also contributed to this success in Zimbabwe.

The experience in Zimbabwe demonstrates that procurement and supply management indicators can be implemented and can help governments to increase the performance of national supply systems and ultimately result in insignificant stockouts and losses of critical medicines in the public health system. However, although indicators are useful to aggregate logistic information and identify emerging bottlenecks, they will not per se improve national supply management systems unless corrective action is implemented with the full involvement of all relevant stakeholders and partners.

of emergency supplies when the risk of a stock-out arises. The Emergency Commodity Fund of the United States President's Emergency Plan for AIDS Relief has also been able to provide assistance to avert antiretroviral therapy disruptions. Through August 2011, the Emergency Commodity Fund has responded to requests from programmes in near stock-out situations of critical antiretroviral medicines and rapid test kits in 11 countries (Angola, Benin, Central African Republic, Côte d'Ivoire, Ethiopia, Ghana, Liberia, Mozambique, South Sudan, Swaziland and Zimbabwe).

### 5.3.7 Antiretroviral drug regimens

In 2011, WHO's AIDS medicines and diagnostics service (AMDS) conducted the fifth annual survey on the distribution and composition of first- and second-line

antiretroviral therapy regimens used and on the status of implementation of WHO's antiretroviral therapy recommendations in low- and middle-income countries. The complete questionnaire was sent to the health ministries of the 97 countries, covering all six WHO regions, with the highest number of people receiving antiretroviral therapy as of December 2010 (76).

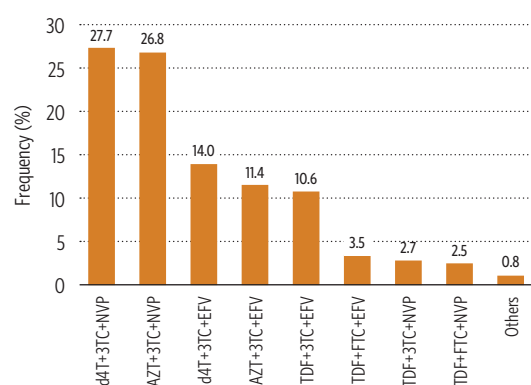
#### 5.3.7.1 Antiretroviral regimens used in antiretroviral therapy

A total of 66 countries provided detailed data on the antiretroviral regimens used by 5 811 000 people, or 87% of the 6.65 million people receiving antiretroviral

**Table 5.12** Characteristics of responding countries, people and regimens in groups A (45 low- and middle-income countries excluding the Region of the Americas) and B (21 low- and middle-income countries from the Region of the Americas)

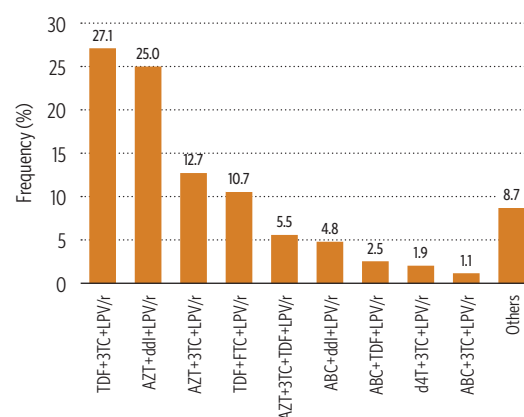
Participating countries	Group A	Group A
Number of countries	45	21
% of the total number of people receiving antiretroviral therapy by December 2010	83% (n = 5 467 000)	5% (n = 344 100)
Regional distribution:		
Sub-Saharan Africa	22	
Latin America and the Caribbean		24
East, South and South-East Asia	8	
Europe and Central Asia	3	
North Africa and the Middle East	8	
Western Pacific	4	
<b>People and regimens</b>	<b>Adults 93% (n = 4 974 000)</b>	<b>Adults 97% (n = 332 000)</b>
First-line regimens	97.1% (n = 4 830 000)	69.1% (n = 230 000)
Second-line regimens	2.9% (n = 142 000)	27.8% (n = 92 000)
Third-line regimens	0.05% (n = 2000)	3.1% (n = 10 000)
Compliance with 2010 WHO recommendations (preferred and alternative) (1)	First line: 99.9% Second line: 95.7%	First line: 98.1% Second line: 60.3%
	<b>Children 7% (n = 383 020)</b>	<b>Children 3% (n = 11 100)</b>
First-line regimens	96.8% (n = 371 000)	72.1% (n = 8000)
Second-line regimens	3.2% (n = 12 000)	24.9% (n = 2800)
Third-line regimens	0.01% (n = 20)	3.0% (n = 300)
Compliance with 2010 WHO recommendations (preferred and alternative)	First line: 99.9% Second line: 88.8%	First line: 84.2% Second line: 80.9%

**Fig. 5.6** Composition and frequency of first-line antiretroviral therapy regimens used among adults in group A (45 low- and middle-income countries, excluding countries from the Region of the Americas), December 2010



d4T: stavudine; 3TC: lamivudine; AZT: zidovudine; NVP: nevirapine; EFV: efavirenz; TDF: tenofovir; FTC: emtricitabine.

**Fig. 5.7** Composition and frequency of second-line antiretroviral therapy regimens used among adults in group A (45 low- and middle-income countries, excluding countries from the Region of the Americas), December 2010



d4T: stavudine; 3TC: lamivudine; AZT: zidovudine; NVP: nevirapine; EFV: efavirenz; TDF: tenofovir; FTC: emtricitabine; LPV/r: lopinavir with a ritonavir boost; ddi: didanosine; ABC: abacavir.

therapy in low- and middle-income countries as of December 2010.<sup>1</sup>

Similar to previous surveys, an initial analysis revealed that the 21 reporting countries from the Region of the Americas (comprising 344 100 people, with 332 000 adults and 11 100 children) presented a pattern of use of antiretroviral drugs notably different from the one observed in the remaining 45 low- and middle-income countries (comprising 5 467 020 people, with 4 974 000 adults and 383 020 children) that responded to the survey. To account for such differences, the results are presented separately between the two groups: group A includes 45 low- and middle-income countries but excludes countries from the Region of the Americas, and group B includes the 21 countries from the Region of the Americas (Table 5.12).

### Adults

In group A, a large majority of the adults (97%) were receiving first-line regimens as of December 2010. Of these, 58% received either zidovudine- or tenofovir-based regimens (39% and 19%, respectively), and the remaining (42%) received a stavudine-containing combination (Fig. 5.6).

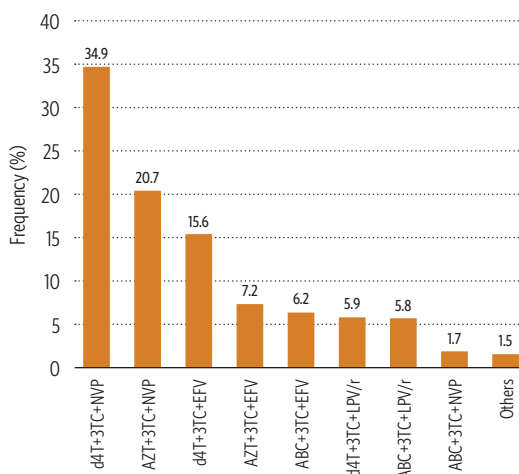
Only 3% of adults ( $n = 142\ 000$ ) were receiving a second-line regimen in group A, with most using a zidovudine-based (48%) or tenofovir-based (47%) regimen. Ritonavir-boosted lopinavir remained the predominant protease inhibitor, used by 95% of the people receiving a second-line regimen (Fig. 5.7).

In group B, comprising 21 reporting countries from the Region of the Americas, 69% of adults were receiving first-line regimens as well, although this proportion was considerably lower than in group A. Of these, 82% received a zidovudine-containing regimen. Similar to previous surveys, an important proportion of the adults receiving first-line treatment reported the use of a protease inhibitor (27%), and only a small proportion (4%) received stavudine. Countries in the Americas reported a higher rate of second-line (28%) regimens among adults.

### Children

In group A, most children (97%) were on first-line regimens as of December 2010 (Fig. 5.8). Of the

**Fig. 5.8 First-line regimens used for children in antiretroviral therapy programmes in group A (45 low- and middle-income countries, excluding countries from the Region of the Americas), December 2010**



d4T: stavudine; 3TC: lamivudine; AZT: zidovudine; NVP: nevirapine; EFV: efavirenz; LPV/r: lopinavir with a ritonavir boost; ABC: abacavir.

children receiving a first-line regimen, 56% used stavudine, 29% zidovudine and 15% abacavir. Uptake of ritonavir-boosted lopinavir in first-line regimens was low (12%).<sup>2</sup> As in adults, stavudine-containing regimens are no longer considered as preferred treatment options for children in accordance with WHO's 2010 antiretroviral therapy guidelines (1) but remain in use in many countries. The development and uptake of user-friendly, affordable and less toxic fixed-dose combinations for children need to be promoted to increase the use of WHO-recommended preferred combinations. In group B, a large majority of children receiving first-line regimens were receiving a zidovudine-containing combination (88%).

### Trends

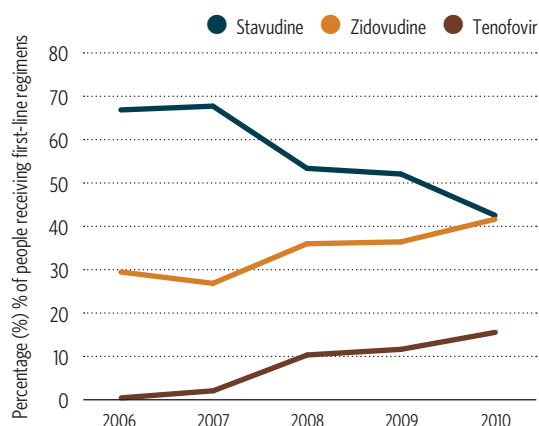
Fifteen countries from group A participated in all five consecutive surveys on the use of antiretroviral drugs between 2006 and 2010.<sup>3</sup> They provided detailed information on the regimens used by 3 100 000 people, representing 47% of the 6 650 000 people receiving antiretroviral therapy in low- and middle-income

<sup>1</sup> Five more countries responded with information on distribution among first- second- and third-line regimens and information on national guidelines (but no data on the composition of the regimens).

<sup>2</sup> WHO's 2010 guidelines on antiretroviral therapy (1) recommend ritonavir-boosted lopinavir in first-line regimens for infants and children younger than 24 months of age who have been exposed to nevirapine or other non-nucleoside reverse-transcriptase inhibitors.

<sup>3</sup> Burkina Faso, Burundi, Cambodia, Cameroon, Ethiopia, India, Kenya, Lesotho, Namibia, Nigeria, Swaziland, Uganda, United Republic of Tanzania, Zambia and Zimbabwe.

**Fig. 5.9 Proportions of people receiving stavudine, zidovudine or tenofovir in first-line regimens in 15 reporting countries, 2006-2010**



countries by December 2010. In this subset of countries, the use of stavudine in first-line regimens decreased from 67% in 2006 to 43% in 2010, whereas the use of zidovudine and tenofovir increased concomitantly from 29% and less than 0.1%, respectively, in 2006, to 42% and 15% of first-line combinations in 2010 (Fig. 5.9).

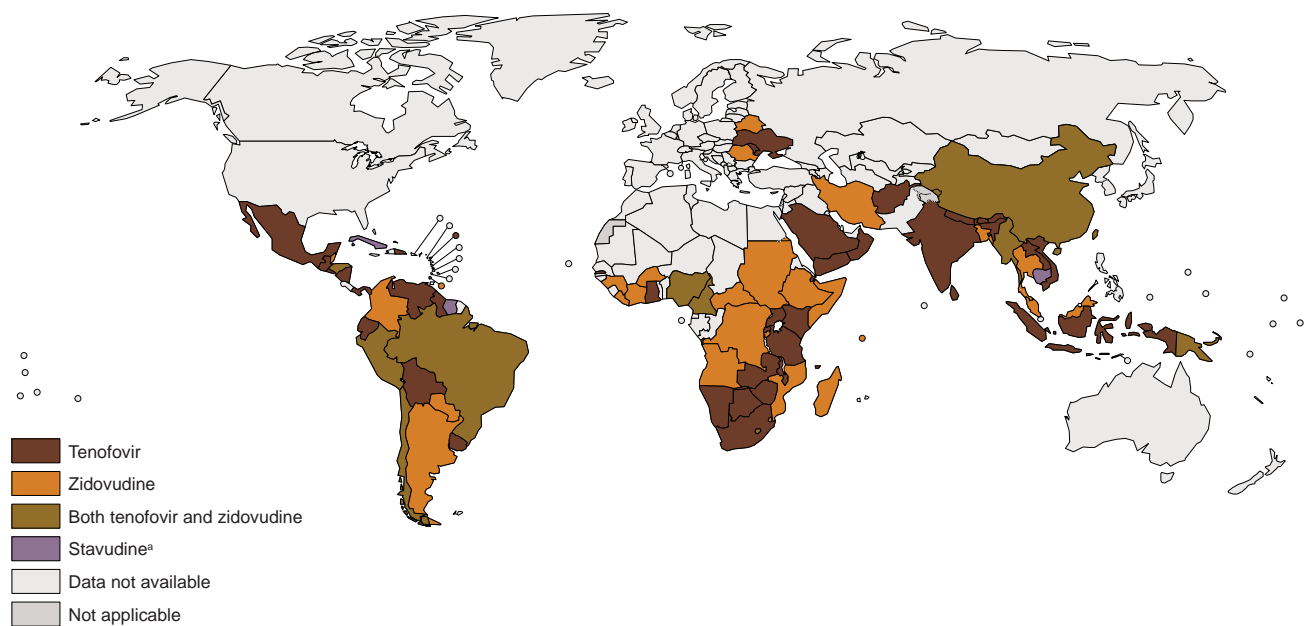
Data from 2009 and 2010 surveys show that a large majority of low- and middle-income countries

have already incorporated or are in the process of adopting into their national treatment guidelines WHO's revised recommendations on eligibility criteria and regimen choice for adults and adolescents (1). Most (88 of 93) reporting countries now recommend initiating antiretroviral therapy for everyone with CD4 counts of or below 350 cells per mm<sup>3</sup>. Two countries apply the same initiation criteria for pregnant women only. Moreover, almost all (84 of 87) reporting countries also recommend shifting away from stavudine-based to zidovudine- or tenofovir-containing regimens as of late 2010 (Fig. 5.10).

### 5.3.7.2 Progress in phasing out the use of stavudine in low- and middle-income countries

In 2010, WHO published revised guidelines on antiretroviral therapy for adults and adolescents recommending that countries phase out the use of stavudine due to its long-term toxicity and side effects. As actual implementation practices often lag behind changes in normative guidelines, a qualitative survey of 24 low- and lower-middle-income countries representing all regions was undertaken in March 2011 to gather data on actual programmatic practices and

**Fig. 5.10 Adoption of the 2010 WHO recommendation on the preferred medicine in first-line antiretroviral regimens into national antiretroviral therapy guidelines, in reporting low- and middle-income countries, 2010-2011**



a Not a preferred medicine in first-line antiretroviral regimens according to 2010 WHO recommendations.

**Table 5.13** Progress in implementing plans for phasing out stavudine in 13 low- and middle-income countries, 2009–2011

Country <sup>a</sup>	Preferred nucleoside reverse-transcriptase inhibitor for substitution	Percentage using stavudine (2009) <sup>b</sup>	Percentage using stavudine (2010) <sup>c</sup>	Estimated percentage of reduction	Start date of implementation	Timeline for completion
South Africa	Tenofovir	82% <sup>d</sup>	40% <sup>e</sup>	↓51%	February 2010	Not available
Kenya	Tenofovir	68%	54%	↓21%	February 2010	2013–2015
India	Tenofovir	46%	47%	↑1%	Under discussion	Under discussion
Zimbabwe	Tenofovir	95%	93%	↓2%	April 2011	2013
United Republic of Tanzania	Tenofovir and zidovudine	72%	63%	↓13%	2011	2015
Malawi	Tenofovir	95%	93%	↓2%	July 2011	Under discussion
Uganda	Tenofovir	18%	2%	↓89%	2009	2010
Mozambique	Zidovudine	78%	7%	↓91%	March 2010	December 2010
Ethiopia	Zidovudine and tenofovir	63%	59%	↓6%	January 2009	2014
Cameroon	Zidovudine and tenofovir	63%	57%	↓10%	2010	2015
China	Zidovudine	48%	43%	↓10%	2011	2013
Swaziland	Zidovudine	40%	27%	↓33%	January 2011	July 2011 - being extended
Ukraine	Tenofovir	8%	6%	↓25%	August 2010	2012

a In descending order of number of people receiving antiretroviral therapy as of December 2010.

b Proportion of people receiving antiretroviral therapy who got a first-line regimen in the country as of December 2009.

c Proportion of people receiving antiretroviral therapy who got a first-line regimen in the country as of December 2010.

d Personal communication, G. Meyer-Rath, Health Economics and Epidemiology Research Office, Boston University and University of the Witwatersrand, Johannesburg, South Africa, 2010.

e Personal communication, Clinton Health Access Initiative – South Africa Team, September 2011.

### Box 5.17

#### Phasing out stavudine in India, Kenya, Malawi and Mozambique

Implementation of stavudine phase-out plans is currently under way in India, Kenya, Malawi and Mozambique, and their experiences illustrate some of the key issues and challenges facing programme managers.

In India, while previous guidelines already recommended zidovudine-based regimens as the preferred first-line therapy for non-anaemic patients (nearly 55% patients are already on Zidovudine based regimen), national expert opinion was initially divided on the full phase-out of stavudine. On the one hand, there was little local evidence of stavudine-related toxicities, and lipodystrophy was not yet a major patient concern. On the other hand, some experts considered that stavudine should be phased out from treatment guidelines in view of its potential long-term toxicities. Overall, the consensus among a group of experts convened in 2010 to assess the matter was to reduce the use of stavudine by (a) substituting it with tenofovir in patients with evidence of long-term stavudine-related toxicities and, (b) recommending that new patients eligible for ART with baseline anaemia be started on a stavudine based regimen and then reevaluated for anaemia after six months on ART. They shall be then shifted to Zidovudine based regimen if anaemia improves or to a tenofovir based regimen if they continue to be anaemic.

In Kenya, stavudine phase-out has proceeded more slowly than originally envisaged. Following the publication of WHO's 2010 antiretroviral treatment recommendations for adults and adolescents, national ART guidelines were promptly revised and a recommendation was issued to substitute patients from stavudine- to tenofovir-based regimens following confirmed or suspected toxicities. This substitution from stavudine did not happen as anticipated in July 2011. An assessment by the National AIDS and STD Control Program (NASCO) of the main ART sites, found that only 9% of patients had their stavudine-based regimens substituted, as opposed to the annual 20% to 30% initially planned. According to national reports, the slower transition of stable adult patients on stavudine to other regimens has been associated with the absence of stavudine-specific toxicities. In response, NASCO has decided to revise national protocols to better assist ART clinics in evaluating patients on stavudine regimens and will organize mentorship support. All paediatric patients on stavudine based ART have been transitioned to either AZT or ABC based ART except older children who are on adult formulations.

In Malawi, insufficient financial resources have delayed or slowed the pace of stavudine phase-out. The failure to secure additional grant funding from the Global Fund to Fight AIDS, Tuberculosis and Malaria has led to the prioritization of a sub-group of patients to shift to preferred regimen. Initially, only pregnant women, co-infected patients with tuberculosis, and patients with lipodystrophy will receive preferred regimens until future Global Fund grants and partner support can be secured.

In Mozambique, implementation of stavudine phase-out was initiated in June 2010, and six months later, 90% of adults and 65% of children were already receiving a zidovudine-based first-line regimen. The choice of zidovudine as the preferred molecule was supported by financial and logistic considerations, including its lower price as compared to tenofovir, the existence of large AZT stocks and the fact that health workers were already familiar with it. In order to improve monitoring and diagnosis of anaemia, one of AZT's major side effects, national authorities will strengthen linkages with PMTCT sites, where investments are being made to improve laboratory capacity.

to identify emerging operational bottlenecks in the phase-out of stavudine. Responses were received from 14 countries (Table 5.13).<sup>1</sup>

Although substantial progress has been made in phasing out the use of stavudine, this process has been uneven. Stavudine has already been almost completely replaced by appropriate WHO-recommended preferred regimens in a few countries, but new first-line regimens are still being rolled out or have only recently started in others. Implementation of phase-out plans has proceeded more swiftly where national treatment guidelines were quickly revised to reflect updated WHO guidance, service delivery providers were adequately trained, phase-out strategies were clearly defined and active support of funding partners was secured.

### 5.3.7.3 Use of laboratory services for monitoring antiretroviral therapy

Sixty-six low- and middle-income countries, with 3 700 000 people receiving antiretroviral therapy as of December 2010, provided data on the availability of selected laboratory services. Laboratory capacity for CD4 count tests was considerably greater than that for quantifying viral load. Among reporting countries, 2155 facilities were equipped to perform CD4 count tests, whereas only 394 facilities had the necessary infrastructure for measuring viral load. Twelve countries reported having no viral load capacity. A

<sup>1</sup> Among responding countries, one (Cambodia) postponed the phase-out of stavudine because of financial constraints.

**Table 5.14** Number of people receiving antiretroviral therapy per laboratory with CD4 cell count or viral load measurement capacity, by geographical region, as of December 2010

Geographical region (number of countries surveyed = 97)	Number of responding countries	CD4	Viral load
		Average number of people receiving antiretroviral therapy per laboratory [range]	Average number of people receiving antiretroviral therapy per laboratory [range]
Sub-Saharan Africa	20	2 287 [10-10 745]	39 539 [5257-326 241]
Middle East and North Africa	8	150 [15-439]	183 [15-531]
East, South and South-East Asia and Oceania	12	897 [23-5350]	5 125 [256-55 686]
Europe and Central Asia	4	1 025 [309-1419]	1 025 [523-1419]
Latin America and the Caribbean	22	1 913 [61-5843]	2 773 [156-20 042]

total of 3 935 000 CD4 tests and 1 175 000 viral load measurements were performed in 2010.

Cross-country comparative analyses are methodologically challenging because of the absence of a standardized package of laboratory services and the consequent existence of a varying number of machines per structure and tests per machine. Nevertheless, available data suggest important disparities in the availability of CD4 and viral load tests across countries and regions (Table 5.14). Moreover, the capacity to perform viral load tests is still considerably limited in most low- and middle-income countries, a fact that may be partly explained by the relatively higher equipment and maintenance costs associated with viral load measurements.

### 5.3.8 Antiretroviral drug prices in low- and middle-income countries

The WHO Global Price Reporting Mechanism collects information on the transaction prices of HIV, TB and malaria drugs and diagnostics from a variety of procurement partners and funding agencies, including the Global Fund to Fight AIDS, Tuberculosis and Malaria and the United States President's Emergency Plan for AIDS Relief. Its broadly representative database currently contains data on the procurement of antiretroviral drugs from 128 countries, including 35 low-income, 51 lower-middle-income and 42 upper-middle-income countries (77). This section reports on price trends based on data accrued up to 1 July 2011.

In low-income countries, the prices of the six most frequently used first-line regimens recommended by WHO declined between 2% and 53% between 2009 and 2010 (Fig. 5.11). Lower-middle-income and upper-middle-income countries had the same downward trend. Regionally, prices tended to be lower in sub-Saharan Africa than in other regions. However, the average prices paid for second-line regimens remain relatively high in all regions. Procurement data show that the number of prequalified generic alternatives available is strongly correlated with the declines in the prices of antiretroviral drugs.

#### 5.3.8.1 Prices of first-line regimens in low-income countries

The median price paid for first-line regimens in low-income countries in 2010 ranged from US\$ 64 per person per year for the fixed-dose combination of stavudine + lamivudine + nevirapine<sup>1</sup> (the most widely used combination) to US\$ 242 for the most expensive fixed-dose combination of tenofovir + emtricitabine + efavirenz (Fig. 5.11). The weighted median price<sup>2</sup> of the 10 most widely used first-line regimens (representing 99% of those prescribed in low-income countries) was US\$ 121 per person per year in 2010, 12% lower than the average weighted median price of the six most widely

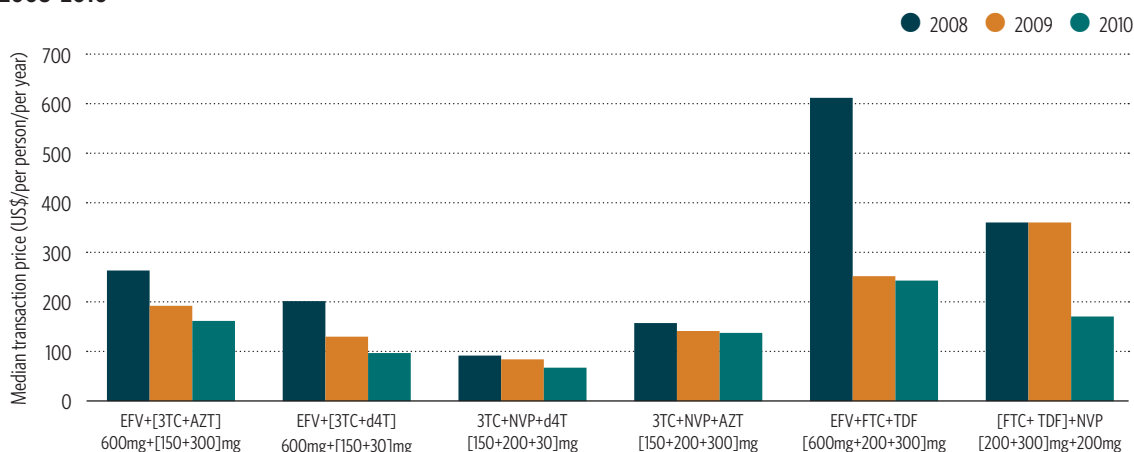
used first-line regimens in 2009 (representing 96% of those prescribed in low-income countries). This decline in prices occurred despite the wider adoption of more expensive tenofovir-based regimens.

These observations are consistent with the price trends observed since 2006: in 2010, the weighted median price of antiretroviral drugs in low-income countries was 60% lower than in 2006. This can be attributed to the sustained scaling up of treatment programmes, leading to growing transaction volumes, greater predictability of demand and more vigorous competition among the various manufacturers.

1 WHO does not recommend stavudine + lamivudine + nevirapine, but it remains the most frequently used fixed-dose combination based on the 2010 survey of the use of antiretroviral drugs (see section 5.3.7).

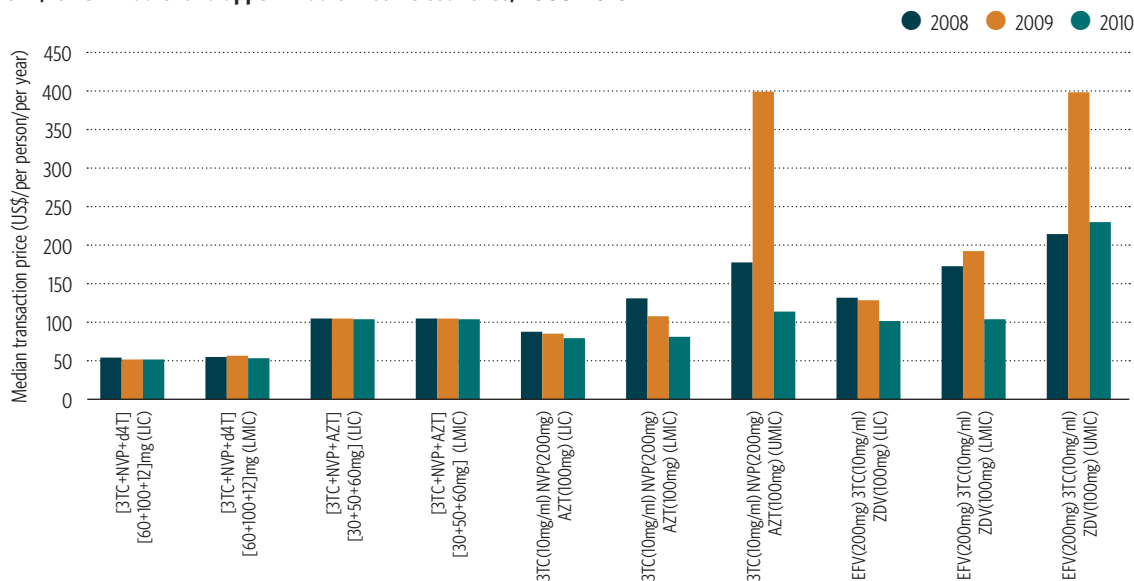
2 The weighted median price is the sum of the median prices of the individual regimens multiplied by the percentage of people using that specific regimen.

**Fig. 5.11 Median annual cost (in US dollars) of first-line antiretroviral drug regimens for adults in low-income countries, 2008-2010**



d4T: stavudine; 3TC: lamivudine; AZT: zidovudine; NVP: nevirapine; EFV: efavirenz; TDF: tenofovir; FTC: emtricitabine.

**Fig. 5.12 Median annual cost (in US dollars) of first-line antiretroviral drug regimens for children (weighing 10 kg or more) in low-, lower-middle- and upper-middle-income countries, 2008-2010**



d4T: stavudine; 3TC: lamivudine; AZT: zidovudine; NVP: nevirapine; EFV: efavirenz; TDF: tenofovir; FTC: emtricitabine. LIC: low-income countries; LMIC: low-middle-income countries; UMIC: upper-middle-income countries.



In 2010, the combination of stavudine + lamivudine + nevirapine remained the most commonly prescribed formulation for children, representing 35% of total first-line regimens prescribed for children weighing 10 kg or more. Its average price declined from US\$ 57 per person per year in 2006 to US\$ 52 in 2009 and early 2010. The average prices of other combinations continued to fall as well (Fig. 5.12). Such price decreases can be attributed to the economies of scale associated with a larger market for formulations for children, especially resulting from UNITAID's focused programme for children, successful negotiations with major generic manufacturers and the development of fixed-dose combination formulations for children.

### 5.3.8.2 Prices of first-line regimens in lower-middle-income countries

The median prices in 2010 ranged from US\$ 70 per person per year for the least expensive regimen of stavudine + lamivudine + nevirapine to US\$ 241 per person per year for the most expensive regimen of tenofovir + emtricitabine + efavirenz. In 2010, the weighted median price of the 10 most widely used combinations in first-line regimens was US\$ 124 per person per year, a decrease of 12% from the previous year.

The most commonly used combination among children (weighing 10 kg or more) was stavudine + lamivudine

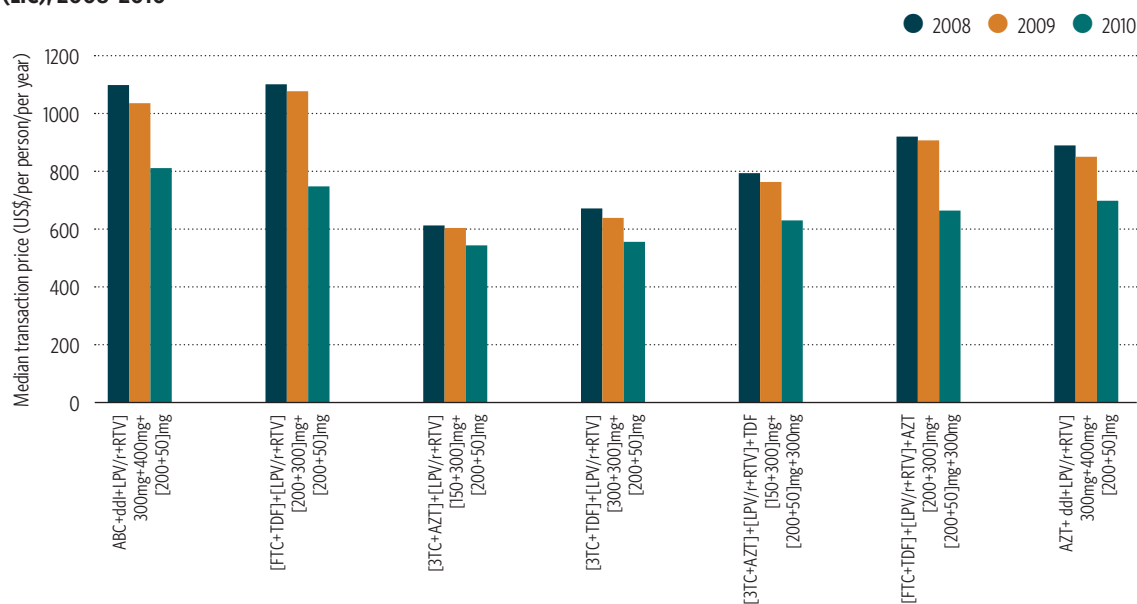
+ nevirapine, and the price fell from US\$ 70 per person per year in 2006 to US\$ 52 in 2010.

### 5.3.8.3 Prices of first-line regimens in upper-middle income countries

In 2010, the median reported prices in upper-middle-income countries ranged from US\$ 66 per person per year for the least expensive regimen of stavudine + lamivudine + nevirapine to US\$ 242 per person per year for tenofovir + emtricitabine + efavirenz. In the same year, the weighted average median price of the 10 most widely used first-line regimens reported in the Global Price Reporting Mechanism was US\$ 121 per person per year – a 40% decrease from the median price recorded in 2009.

The growing use of generic medicines (especially tenofovir- and nevirapine-containing formulations) in upper-middle-income countries is partly responsible for this rapid decline in median prices: in early 2010, about 70% of the transactions recorded in the Global Price Reporting Mechanism involved generic antiretroviral drugs versus about 30% in previous years. In addition, a few lower-middle-income countries became upper-middle-income countries but retained their previous price levels. However, the fall in median prices observed between 2009 and 2010 may not be representative of all upper-middle-income countries, as data captured through the Global Price Reporting Mechanism may not comprehensively include all relevant transactions.

**Fig. 5.14 Median annual cost (in US dollars) of second-line antiretroviral drug regimens for adults in low-income countries (LIC), 2008-2010**



d4T: stavudine; 3TC: lamivudine; AZT: zidovudine; NVP: nevirapine; EFV: efavirenz; TDF: tenofovir; FTC: emtricitabine; LPV/r: lopinavir with a ritonavir boost; ddi: didanosine; ABC: abacavir.

Indeed, some price increases have been noted elsewhere (78).

#### 5.3.8.4 Prices of second-line regimens in low- and middle-income countries

The reported prices of second-line regimens also declined in 2010 but remained higher than the prices of first-line regimens across low-income (Fig. 5.13), lower-middle-income and upper-middle-income countries. In 2010, the median reported cost of the most commonly used second-line regimen, lamivudine + tenofovir + ritonavir-boosted lopinavir, was US\$ 554 per person per year in low-income-countries, US\$ 692 per person per year in lower-middle-income countries and US\$ 601 in upper-middle-income countries. The median reported cost of zidovudine + didanosine + ritonavir-boosted lopinavir, the second most commonly used second-line regimen, was US\$ 701 per person per year in low-income-countries, US\$ 908 per person per year in lower-middle-income countries and US\$ 970 in upper-middle-income countries, with important variation across countries (78).

The decline in the prices of second-line drugs between 2006 and 2010 can be attributed to falls in the prices of abacavir, ritonavir-boosted lopinavir and tenofovir, the prequalification of generic versions of ritonavir-boosted lopinavir and tenofovir, the expiry of the patent for didanosine, the scaling up of treatment programmes, new pricing policies by research-based pharmaceutical companies and the efforts of key partners to expand the market for second-line regimens. Although these developments are encouraging, addressing the relative higher cost of second-line regimens remains an important objective as antiretroviral therapy programmes mature and the number of people who need second-line regimens continues to grow.

## 5.4 Collaborative TB and HIV activities

HIV-related TB remains a serious challenge for the health-sector response and for people living with HIV. Of the estimated 34 million people living with HIV, about one third are estimated to have concomitant latent infection with *Mycobacterium tuberculosis*. In 2010, of 8.8 million incident TB cases worldwide, 1.1 million were among people living with HIV, with an estimated 350 000 deaths [320 000–390 000]. Sub-Saharan Africa continues to account for the global majority of the people living with HIV and TB, with an

estimated 82% in 2010. HIV is the strongest risk factor for developing active TB disease, and in some countries up to 82% of people with TB have HIV (79).

Collaborative activities between national TB and HIV programmes are essential to prevent, diagnose and treat TB among people living with HIV and HIV among people with TB. These include establishing mechanisms for collaboration, such as coordinating bodies, joint planning, surveillance and monitoring and evaluation; decreasing the burden of HIV among people with TB (with HIV testing and counselling for individuals and couples, co-trimoxazole preventive therapy, antiretroviral therapy and HIV prevention, care and support); and decreasing the burden of TB among people living with HIV (with the three I's for HIV and TB: intensified case-finding; TB prevention with isoniazid preventive therapy and early access to antiretroviral therapy; and infection control for TB). Initiating antiretroviral therapy for all people living with HIV with CD4 cell counts less than 350 cells per mm<sup>3</sup> or with active TB irrespective of CD4 count is important to prevent TB- and HIV-related transmission, morbidity and mortality. Integrating HIV and TB services, when feasible, may be an important approach to improve access to services for people living with HIV, their partners, families and the community.

### 5.4.1 Reducing the burden of HIV among people with TB and their communities

#### Provide HIV testing and counselling

Provider-initiated HIV testing should be offered to everyone with TB and people presenting with signs and symptoms suggesting TB in settings with a high prevalence of HIV infection (80). TB often represents an early entry point for detecting and treating HIV. A total of 2.1 million people with TB were tested for HIV in 2010, equivalent to 34% of all notified TB cases, versus 28% in 2009 and 3% in 2004. Of the people tested in 2010, 488 000 (23%) were HIV-positive. In the WHO African Region, 880 000 people with TB (59%) were tested for HIV, and 405 000 (46%) were HIV-positive.

#### Scale up co-trimoxazole preventive therapy

All people with both HIV and TB should be given co-trimoxazole preventive therapy during their TB treatment and for life thereafter unless contraindicated or unless they receive antiretroviral therapy and their CD4 cell count rises above 500 cells per mm<sup>3</sup>. To gain maximum benefit, people with TB should start co-

trimoxazole preventive therapy as soon as possible after HIV infection is diagnosed, as mortality is highest early in the course of TB treatment. Although there has been some progress, slightly more than 300 000 people with both TB and HIV were receiving co-trimoxazole preventive therapy at the end of 2010, representing 77% of the people with TB known to be living with HIV. In sub-Saharan Africa, 76% of the people identified with HIV and TB were receiving co-trimoxazole.

#### **Scale up antiretroviral therapy and ensure HIV care, treatment and support**

WHO recommends that antiretroviral therapy be considered for all people living with HIV who have TB as soon as possible and no later than eight weeks after TB treatment begins, regardless of immune stage. Among people with profound immune suppression (CD4 count less than 50 cells per mm<sup>3</sup>), antiretroviral therapy should be started as a matter of emergency within the first two weeks after TB treatment starts.

However, expanding access to antiretroviral therapy for people with both TB and HIV continues to be a major challenge. Globally, access to antiretroviral therapy for people diagnosed with TB increased modestly from 173 000 people in December 2009 to more than 200 000 at the end of 2010 (47) among 101 reporting countries. In 2005, 69 countries had reported 67 000 people diagnosed with TB receiving antiretroviral therapy.

In 2010, 20% of the total estimated number of people with TB and HIV – or 46% of people with TB who tested positive for HIV – were receiving antiretroviral therapy. In Africa, 42% (158 000) of the estimated number of people with both TB and HIV were reported to be receiving antiretroviral therapy. These figures are lower than the estimated coverage of antiretroviral therapy of 47% for all eligible people living with HIV in low- and middle-income countries. Given evidence of growing access to HIV testing by people with TB, and better links between TB and HIV services, this gap may reflect the weaknesses of reporting access to care among people with both TB and HIV by settings providing HIV services. However, this may also reflect poorer access to life-saving antiretroviral therapy by people with TB.

In addition to considerably improving the quality of life, reducing morbidity and enhancing the survival of people with advanced HIV infection, antiretroviral therapy

reduces HIV transmission and the incidence of TB (81,82). Evidence has also emerged on how antiretroviral therapy coverage affects TB incidence at the community or population level (83). In Malawi, for instance, increased antiretroviral therapy coverage in a rural community has been associated with a 33% decline in TB incidence (84). Early access to antiretroviral therapy should be part of the TB prevention package together with the three I's for HIV and TB (see section 5.4.2).

#### **5.4.2 Decreasing the burden of TB among people with HIV**

WHO recommends the three I's for HIV and TB – intensified TB case-finding, isoniazid preventive treatment and TB infection control – to decrease the burden of TB among people with HIV. In 2010, progress continued in expanding the availability of these interventions in low- and middle-income countries. As of December 2010, among 119 countries providing data, 69 (58%) indicated that isoniazid preventive therapy was part of their package of interventions for people living with HIV, versus 48 (or 43%) among 112 countries reporting in 2009. Ninety per cent (113 of 125) of countries reported having policies to promote intensified case finding, versus 60% in 2009, and 78% (98 of 126 countries) had a policy for TB infection control, versus 51% in 2009.

##### **5.4.2.1 Implement intensified TB case-finding**

Intensified case-finding and treatment of TB among people living with HIV interrupts disease transmission, reduces mortality, decreases the risk of nosocomial (hospital-acquired) TB transmission and offers the opportunity to provide isoniazid preventive therapy to people living with HIV unlikely to have active TB disease. In 2010, 72 low- and middle-income countries provided data on TB screening at the last visit for HIV care. The reported number of adults and children screened for TB at their last visit was 2.3 million.<sup>1</sup> In the subset of 69 countries also reporting on the number of adults and children enrolled in HIV care, coverage was estimated at 58% among people in HIV care in 2010.

##### **5.4.2.2 Provide access to isoniazid preventive therapy**

WHO recommends that national HIV programmes provide isoniazid preventive therapy as part of the package of care for people living with HIV when active TB is excluded (85,86). In 2010, despite increased

<sup>1</sup> This figure does not correct for potential double testing.

adoption at the policy level, only about 180 000 adults and children were receiving isoniazid preventive therapy in 54 countries. In a subset of 50 countries also providing the total number of adults and children newly enrolled in HIV care in 2010, coverage of isoniazid preventive therapy was 12%.

#### 5.4.2.3 Ensure TB infection control in health care and congregate settings

HIV is the strongest risk factor for the development of TB, and people living with HIV are very vulnerable to the risk of nosocomial TB transmission. With the roll-out of HIV care and treatment, people living with HIV, their partners and families are increasingly accessing care in health care settings. Multidrug-resistant and extensively drug-resistant TB have especially been recognized as emergent risks in these contexts. It is essential that health care and congregate settings have a plan and implement administrative, environmental and personal infection control and protection measures to reduce the transmission of TB. Although this is difficult to measure accurately, 77 low- and middle-income countries reported a cumulative number of 15 232 health facilities providing antiretroviral therapy services with demonstrable TB infection control practices, representing 76% of the number of facilities providing antiretroviral therapy in these countries.

### 5.5 Co-trimoxazole prophylaxis

Co-trimoxazole preventive therapy is a simple, inexpensive and highly effective intervention that has been shown to reduce mortality among people receiving antiretroviral therapy by about 50% and to improve the retention of people living with HIV throughout the continuum of HIV care. According to current WHO

recommendations, all adults and adolescents with symptomatic HIV disease and asymptomatic people living with HIV with CD4 cell count less than 350 cells/mm<sup>3</sup> should initiate co-trimoxazole preventive therapy (87). Further, all HIV-exposed infants born to mothers living with HIV should also receive co-trimoxazole preventive therapy, beginning at 4–6 weeks of age and continuing until HIV infection can be excluded (88). Expanding the availability and uptake of co-trimoxazole preventive therapy is thus a key element in further improving treatment outcomes and the survival of people living with HIV. Among 126 reporting low- and middle-income countries, 86% indicated having in place national guidelines on providing co-trimoxazole for people living with HIV.

Ninety-two low- and middle-income countries provided data on access to co-trimoxazole preventive therapy in 2010 (39 from sub-Saharan Africa, 21 from East, South and South-East Asia, 12 from Europe and Central Asia, 11 from Latin America and the Caribbean and 9 from North Africa and the Middle East). In these countries, 3.3 million people received co-trimoxazole preventive therapy in 2010.

Among these countries providing data on access to co-trimoxazole preventive therapy, a subset of 82 countries also provided data on estimated co-trimoxazole needs, defined as the number of people in HIV care and eligible for co-trimoxazole preventive therapy. In this subgroup of countries, 71% of eligible people actually received co-trimoxazole preventive therapy (2.93 million).<sup>1</sup>

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<sup>1</sup> The samples from which these figures are derived may not be representative of the full cohort of people enrolled in HIV care, thereby limiting the interpretation of the resulting coverage rates. Valid monitoring systems need to be established to track progress and obstacles in providing the full range of HIV care services and to develop improved estimates of coverage and attrition, especially during the period preceding enrolment in antiretroviral therapy.

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# Scaling up services for key populations at higher risk of HIV infection



## Prevention

Coverage of harm reduction programmes for people who inject drugs remained limited in 2010. Among 107 reporting countries, 42 had needle and syringe programmes and 37 offered opioid substitution therapy.

In the subset of 30 countries that provided data on needle and syringe programmes, the median number of syringes distributed per year per person who injects drugs was 50.7, still below the internationally recommended level of 200 syringes per person who injects drugs per year. Three low- and middle-income countries – Bangladesh, India and Slovakia – provided 200 or more syringes per person who inject drugs per year, and an additional three – Kazakhstan, Tajikistan and Viet Nam – distributed between 100 and 200 syringes per person who inject drugs per year.

Less than 2.5% of people who inject drugs received opioid substitution therapy among 32 reporting countries.

A total of 113 low- and middle-income countries reported information on the availability of programmes engaging men who have sex with men. The most commonly reported interventions were HIV testing and counselling, followed by antiretroviral therapy and care. Regionally, the availability of targeted interventions for men who have sex with men was higher in Latin America and the Caribbean, in Europe and Central Asia and in East, South and South-East Asia.

A total of 113 low- and middle-income countries reported information on the existence of programmes and policies engaging sex workers. The most commonly available intervention was HIV testing and counselling, followed by antiretroviral therapy and care. On a

regional basis, availability was generally highest in East, South and South-East Asia and was substantially more limited in North Africa and the Middle East. Although sexually transmitted infection management is available in many countries for people who inject drugs, men who have sex with men, and sex workers, the prevalence of active syphilis in these key populations is still over 15% in several countries.

## Testing and counselling

The reported proportions of selected key populations at higher risk of HIV infection receiving testing and counselling in the past 12 months remain limited: the median percentage receiving HIV testing and counselling was 49% among sex workers, 32% among men who have sex with men and 23% among people who inject drugs.

In the subset of countries reporting multiple surveys, the median uptake of HIV testing and counselling increased from 39% in 2006–2008 to 52% in 2009–2010 among sex workers, increased from 30% to 35% among men who have sex with men and from 23% to 25% among people who inject drugs.

## Treatment and care

In Europe and Central Asia, available data reveal continued inequity in the access of people who inject drugs to antiretroviral therapy. In 2010, people who inject drugs represented 62% of the cumulative number of reported HIV cases with a known route of transmission but only 22% of those receiving antiretroviral therapy.

## 6.1 Overview

This chapter describes progress made in expanding access to and coverage of selected health-sector interventions for HIV prevention among people who inject drugs, men who have sex with men and sex workers. HIV continues to disproportionately affect these specific populations, not only in countries with low and concentrated epidemics but also in generalized epidemic settings. High HIV prevalence rates have been reported in all three populations across all regions (see Chapter 1). Realizing the vision of zero new HIV infections and zero AIDS-related deaths thus depends on accelerating progress in controlling the epidemic among these key populations at higher risk of HIV infection and transmission.

Robust epidemiological surveillance among people who inject drugs, men who have sex with men and sex workers, including estimating population sizes, is

### Box 6.1

#### Methodological notes on the quality and interpretation of data

Member States directly reported the data collated and discussed in this section on key populations at higher risk of HIV infection to WHO, UNAIDS and UNICEF in 2011. Many of the data points provided by countries on the coverage and impact of interventions for key populations at higher risk of HIV infection come either from surveys with relatively small sample sizes or from sentinel sites whose methods and sample sizes can be highly heterogeneous. In addition, official government data may underestimate actual service availability if they do not consider data from programmes run by nongovernmental organizations, which in many contexts are major service providers to key populations at higher risk of HIV infection. The fact that a particular policy may be in place does not indicate the level, scope or quality of services available or actually delivered. Considerable effort is currently underway to improve data collection methods and processes (2).

Interpretations of coverage data must consider the fact that many surveys were conducted in a few large urban areas and the fact that the results may not necessarily reflect prevailing conditions at the national level. As a result, coverage estimates may not be based on nationally representative estimates and may not be comparable across countries. Moreover, estimates of the sizes of these populations are still insufficiently available across regions, thus preventing the development of global estimates of coverage.

The analyses of HIV data presented in this section do not include surveys conducted before 2008 and those based on sample sizes with less than 100 participants. In addition, regional medians are only provided when the number of observations is equal to or greater than five.

key to assessing the effectiveness and impact of HIV prevention programmes (see Chapter 1). Important progress has been made in recent years in improving HIV surveillance among these communities (Box 6.2). However, people who inject drugs, men who have sex with men and sex workers continue to face high levels of stigma and discrimination and laws that criminalize their behaviour, thus preventing access to health care, including preventive commodities, and hindering the very collection of data on which the design of more effective and efficient programmes depends (1). Poverty, exclusion and other structural factors, including gender inequity, interact as additional barriers to expand access to essential services.

Enhancing the effectiveness of prevention efforts requires rapidly scaling up proven interventions and assuring the quality of programming. Moreover, the development of new and creative approaches must be intensified. Upcoming guidelines on indicators and target setting for universal access to HIV prevention, treatment, care and support for sex workers and men who have sex with men should facilitate the assessment of uptake of available interventions, in addition to their standard availability.

## 6.2 Health sector interventions to prevent HIV infection among key populations at higher risk

### 6.2.1 People who inject drugs

WHO, UNODC and UNAIDS recommend a comprehensive package of nine interventions for HIV prevention, treatment and care among people who inject drugs. These are: ① needle and syringe programmes, ② opioid substitution therapy (for people dependent on opioid drugs) and other drug dependence treatments; ③ HIV testing and counselling, ④ antiretroviral therapy, ⑤ prevention and treatment of sexually transmitted infections, ⑥ condom promotion for people who inject drugs and their sexual partners, ⑦ targeted information, education and communication, ⑧ diagnosis and treatment of and vaccination for viral hepatitis and ⑨ prevention, diagnosis and treatment of TB (3).

A total of 109 low- and middle-income countries reported information on the existence of programmes and policies engaging people who inject drugs in 2010

**Table 6.1** Number of low- and middle-income countries (of 149 countries surveyed) reporting the availability of interventions for HIV prevention, treatment and care among people who inject drugs

	Needle and syringe programmes	Drug dependence treatment: opioid substitution therapy	Drug dependence treatment: others	HIV testing and counselling	Antiretroviral therapy	Preventing and treating sexually transmitted infections	Condom programming for people who inject drugs and their sexual partners <sup>a</sup>	Targeted information, education and communication	Viral hepatitis diagnosis, treatment and vaccination	Prevention, diagnosis and treatment of TB
Number of countries reporting	107	107	108	109	109	108	108	108	105	106
Number of countries reporting this intervention	42	37	58	70	71	66	50	63	41	46
East, South and South-East Asia										
Yes	15	12	18	22	22	21	20	21	10	15
No	11	13	8	4	4	5	6	5	15	11
Europe and Central Asia										
Yes	20	20	20	19	20	17	15	18	14	11
No	0	0	0	1	0	2	5	1	4	7
Latin America and the Caribbean										
Yes	4	2	9	11	11	11	6	8	5	8
No	13	15	8	6	6	6	10	9	11	9
North Africa and the Middle East										
Yes	2	2	7	9	9	8	6	8	7	6
No	8	8	3	2	2	3	5	3	4	4
Sub-Saharan Africa										
Yes	1	1	4	9	9	9	3	8	5	6
No	33	34	31	26	26	26	32	27	30	29

a This indicator may underestimate the availability of condom programmes, since it may not include non-targeted programming from non-public providers.

(Table 6.1), an increase of 18% compared with the 92 countries providing data in 2009.

Regionally, most countries in Europe and Central Asia and in East, South and South-East Asia reported offering the most interventions of the comprehensive package of interventions for people who inject drugs, although these data do not assess their scope or quality (Table 6.2).

Availability of needle and syringe programmes and opioid substitution therapy, key interventions in the recommended package for people who inject drugs, remained limited, being reported by only 43 and 37 countries, respectively. In contrast, 58 countries reported the availability of other types of drug dependence treatment, although they may not be as effective as opioid substitution therapy. More than two thirds of all reporting countries indicated having services that provide HIV testing and counselling as well as antiretroviral therapy to people who inject drugs. Other interventions were less frequently available.

Although the combination of suitable interventions and their specific content depend on the context in which they are applied, access to sterile injecting equipment and opioid substitution therapy are key elements of any successful programme to reduce HIV transmission associated with injecting drug use (3). Nevertheless, despite ongoing global efforts and advocacy, needle and syringe programmes and opioid substitution therapy remain relatively unavailable in many regions, notably in Latin America and the Caribbean, in the Middle East and North Africa. In sub-Saharan Africa, only one country – Mauritius – reported making available scaled-up needle and syringe programmes and opioid substitution therapy for people who inject drugs (4). Although responses must be context-specific, this is a critical gap in national responses, as recent research has clearly documented the occurrence of injecting drug use in the region and its contribution to the spread of HIV (4,5).

Figures published through other reporting systems, such as those undertaken by the United Nations Reference

**Table 6.2** Availability of selected policies or interventions for people who inject drugs and HIV prevalence among them in 39 countries, 2010<sup>a</sup>

Country	Number of interventions adopted as policy	Needle and syringe programmes	Opioid substitution therapy	HIV prevalence among people who inject drugs (%)
East, South and South-East Asia (11 countries)				
Afghanistan	9	Yes	Yes	7
Cambodia	7	Yes	Yes	24
China	10	Yes	Yes	7
Indonesia	9	Yes	Yes	27
Lao People's Democratic republic	7	No	No	17
Malaysia	10	Yes	Yes	22
Myanmar	10	Yes	Yes	28
Nepal	8	Yes	Yes	19
Pakistan	9	Yes	No	21
Thailand	9	Yes	Yes	31
Viet Nam	8	Yes	Yes	18
Europe and Central Asia (13 countries)				
Albania	10	Yes	Yes	0
Armenia	8	Yes	Yes	9
Bosnia and Herzegovina	8	Yes	Yes	< 1
Croatia	10	Yes	Yes	1
Hungary	8	Yes	Yes	0
Kazakhstan	10	Yes	Yes	3
Latvia	5	Yes	Yes	6
Republic of Moldova	8	Yes	Yes	16
Romania	8	Yes	Yes	1
Serbia	8	Yes	Yes	2
Tajikistan	10	Yes	Yes	17
The Former Yugoslav Republic of Macedonia	10	Yes	Yes	0
Ukraine	9	Yes	Yes	23
Latin America and the Caribbean (4 countries)				
Brazil	9	Yes	No	6
Colombia	7	No	Yes	2
Mexico	9	Yes	Yes	5
Paraguay	7	Yes	No	9
North Africa and the Middle East (8 countries)				
Egypt	NR	-	-	7
Jordan	8	No	No	0
Lebanon	10	Yes	Yes	0
Morocco	9	Yes	Yes	14
Oman	7	No	No	2
Iran (Islamic Republic of)	10	Yes	Yes	13
Syrian Arab Republic	4	No	No	6
Tunisia	6	No	No	3
Sub-Saharan Africa (4 countries)				
Ghana	0	No	No	11
Kenya	7	No	No	21
Mauritius	9	Yes	Yes	47
Nigeria	5	No	No	4
<b>Total yes</b>		<b>30</b>	<b>28</b>	
<b>Total no</b>		<b>9</b>	<b>11</b>	

a Opioid substitution therapy and other drug dependence treatments are counted as two interventions in this table, bringing the total number of WHO recommended interventions to 10.

Group on HIV and Injecting Drug Use and Harm Reduction International (formerly the International Harm Reduction Association), may differ from those submitted by countries to WHO, UNAIDS and UNICEF because scope of the respective surveys differs and because WHO, UNAIDS and UNICEF focus on low- and middle-income countries only. The United Nations Reference Group on HIV and Injecting Drug Use found that, in 2009, among 158 countries with reports of injecting drug use and 120 countries with reports of HIV among people who inject drugs, needle and syringe programmes and opioid substitution therapy had been implemented in 82 and 70 countries, respectively (6). A survey conducted in 2010 by Harm Reduction International found similar figures, with 82 countries providing needle and syringe programmes and 73 offering opioid substitution therapy (7,8).

WHO and UNODC recommend that psychosocially assisted pharmaceutical treatment should not be compulsory (9). Nevertheless, recent analysis of compulsory treatment suggests that up to several hundred thousand people who inject drugs are administratively or legally detained to undergo treatment and that opioid substitution therapy is made available only to a fraction of opioid-dependent detainees (10). Drug detention centres have poor records in preventing drug use and high rates of recidivism. In addition, drug detention centres can enhance HIV and related risks, violate human rights and undermine the potential success of proven interventions (11).

Thirty-nine countries provided data on the prevalence of HIV infection among people who inject drugs (Table 6.3), ranging from close to 0% in Albania, Lebanon and elsewhere to 31% in Thailand and 47% in Mauritius.

Seven countries, including Myanmar and Tajikistan, reported having adopted all policies included in the package of recommended interventions. Among countries reporting HIV prevalence rates greater than 0% among people who inject drugs, 25 indicated having available needle and syringe programmes and 23 opioid substitution therapy. However, the adoption of these two interventions is still inadequate in many contexts. In sub-Saharan Africa, only four countries provided data on their availability, and three reported providing neither needle and syringe programmes nor

opioid substitution therapy, including Ghana and Kenya, where the HIV prevalence among people who inject drugs exceeds 10%.

In 2010, 33 countries provided data for assessing the number of needle and syringe programme sites per 1000 people who inject drugs. As observed in previous years, most reporting countries are in Europe and Central Asia and in East, South and South-East Asia. Available data show that accessibility remained limited in 2010, with a median of 1.4 needle and syringe programme sites per 1000 people who inject drugs, the same figure observed among 28 reporting countries in 2009. The highest levels were observed in Viet Nam and Slovakia, with 17.1 and 8.6 needle and syringe programme sites respectively per 1000 people who inject drugs.

Thirty countries reported a median of 50.7 syringes and needles distributed per person who injects drugs per year, an increase from the 44.4 reported by 27 countries in 2009. These levels are nevertheless substantially below the minimum of 200 syringes per person who injects drugs per year recommended by WHO, UNODC and UNAIDS as a key HIV prevention policy for this population (3). Among countries providing data in 2010, uptake reached the internationally recommended target in only three – Bangladesh, India and Slovakia. In three others – Kazakhstan, Tajikistan and Viet Nam – the number of syringes distributed per person who inject drugs per year was between 100 and 200.

Coverage of opioid substitution therapy remained limited as well in most of the 32 countries providing data, with a median of 2.4% of people who inject drugs receiving this intervention. Coverage was highest in the Islamic Republic of Iran and Mauritius, where 84% and 32%, respectively, of people who inject drugs had access to opioid substitution therapy.

Greater investment is needed to expand coverage of harm reduction interventions, including needle and syringe programmes and opioid substitution therapy. In this context, the participation of civil society and local communities is key to ensure that policies are tailored to the local context and to respond to the needs of people who inject drugs (Box 6.2).

**Table 6.3** Estimated percentage of people who inject drugs receiving opioid substitution therapy and estimated number of syringes and needles distributed by needle and syringe programmes per person who injects drugs during the past 12 months, 2010

Country	Estimated number of people who inject drugs	Number of needle and syringe programmes sites per 1000 people who inject drugs	Number of syringes per person who injects drugs distributed by needle and syringe programmes	Percentage of people who inject drugs receiving opioid substitution therapy
Number of countries reporting	34	33	30	32
Median for all reporting countries		1.4	50.7	2.4
<b>East, South and South-East Asia</b>				
Afghanistan	20 000	1.1	34.7	0.4
Bangladesh	40 000	3	214.4	0.3
Cambodia	2 100	0.5	43.8	2.9
China	642 800	1.6	18.9	28.4
India	177 000	1.4	228.2	3
Indonesia	105 800	1.8	10.2	2.4
Iran (Islamic Republic of)	250 000	2.7	35.9	84.0
Malaysia	170 000	1.7	17	21.8
Myanmar	75 000	0.6	91.7	1.5
Nepal	28 500	1.6	56.5	1.2
Sri Lanka	700	0	...	0
Thailand <sup>a</sup>	40 000-97 000	0.5-1.2	2.4-5.8	2.3-5.5
Viet Nam	193 300	17.1	140.6	1.3
Median		1.6	44	2
<b>Europe and Central Asia</b>				
Albania	7 000	0.7	...	7.5
Armenia	5 000	0.6	15.7	2.2
Belarus	50 000	0.7	46.5	0.9
Bosnia and Herzegovina	7 500	1.1	50.7	9.8
Croatia	6 300	1.3	98.4	22.4
Georgia	40 000	0.3	26.6	7
Hungary	5 700	3	65.8	17.4
Kazakhstan	119 100	1.4	176.4	0.1
Latvia	18 000	1	17.3	1.1
Republic of Moldova	25 000	1.2	65.8	1.4
Romania	17 700	0.6	54.6	9.1
Serbia	18 000	0.2	25.5	6.9
Slovakia	800	8.6	209.1	75
Tajikistan	25 000	1.9	104.4	0.1
The former Yugoslav Republic of Macedonia	10 200	1.5	49	11.2
Ukraine	290 000	5.3	62.4	2.1
Median		1.1	55	7
<b>Latin America and the Caribbean</b>				
Brazil	472 200	...	...	...
Mexico	64 300	0.4	2.7	...
<b>North Africa and the Middle East</b>				
Morocco	18 000	0.2	2.8	0.4
<b>Sub-Saharan Africa</b>				
Madagascar	600	1.7	...	0
Mauritius	10 000	5.2	51.9	32.8

a Thailand is not included in the median for East, South and South-East Asia.

## Box 6.2

### **MENAHRA: strengthening civil society to support and expand harm reduction activities in the Middle East and North Africa**

In 2007, WHO and the International Harm Reduction Association partnered to establish the Middle East and North Africa Harm Reduction Association (MENAHRA) with financial support from the DROSOS Foundation. MENAHRA consists of a multi-stakeholder regional network on harm reduction involving civil society organizations, governments, experts and academe. It is represented by a Secretariat and three subregional knowledge hubs located in the Islamic Republic of Iran, Lebanon and Morocco, and it seeks to support civil society across the region to lead the change towards evidence-informed policies and accelerate the roll-out of harm reduction strategies.

Through its work to date, MENAHRA has delivered over 30 training workshops with more than 12 training resource modules and 6 advocacy workshops. Advocacy materials have also been disseminated to harm reduction stakeholders in 18 countries from the Middle East, North Africa and beyond through its online resources and conferences. It also organized and hosted the first regional conference on harm reduction in 2009 and hosted Harm Reduction International's annual conference in 2011. Ten civil society organizations in seven countries in the Middle East and North Africa have benefited from direct MENAHRA technical and financial support. More than 1000 people are now continually receiving information related to harm reduction in the region through the MENAHRA web site and newsletters.

Stakeholders have also indicated that MENAHRA has been able to positively influence the policy environment towards greater acceptance of harm reduction as a core strategy for HIV prevention for people who inject drugs. In 2009, Morocco revised its national strategy on drug use to incorporate harm reduction activities. In 2010, Tunisia developed a harm reduction strategy and the Syrian Arab Republic secured funding from the Global Fund to Fight AIDS, Tuberculosis and Malaria to implement harm reduction interventions through a successful Round 10 proposal. Pakistan approved piloting opioid substitution therapy in 2010, and funding from the Global Fund has now been obtained to scale up coverage to 1000 people who inject drugs. Partner civil society organizations have also highlighted that their cooperation with MENAHRA has allowed them to expand their needle and syringe programmes and outreach to people who inject drugs and to improve collaboration with national stakeholders.

MENAHRA has been able to mobilize additional resources from the Global Fund to Fight AIDS, Tuberculosis and Malaria through a five-year, US\$ 8.3 million grant approved in funding Round 10 in 2010. This is the first regional Global Fund grant exclusively dedicated to support harm reduction and civil society activities. Through this grant, MENAHRA and the Global Fund expect to provide additional support for civil society organizations to catalyse an environment conducive to the implementation of harm reduction strategies, build the capacity of service providers and supply technical resources to assist and accelerate programme implementation.

### **6.2.2 Men who have sex with men**

Men who have sex with men continue to be at considerably higher risk for HIV infection worldwide compared with general populations surveyed. A meta-analysis of surveillance data in low- and middle-income countries found that men who have sex with men are 19.3 times more likely to be living with HIV than the general population (12). The reported prevalence of HIV infection among men who have sex with men ranges from 0% to 33%, with rates surpassing 20% in countries as diverse as Bolivia, Jamaica, Mexico, Myanmar, Thailand, Trinidad and Zambia (13). Syphilis infection, which is recognized as facilitating HIV infection, is highly prevalent among MSM, particularly among MSM living with HIV (Box 6.4) (13). The reported prevalence of active syphilis infection among men who have sex with men was over 15% in countries such as Afghanistan, Argentina, Fiji, Guatemala, Jamaica, Morocco, Nicaragua, and Paraguay (Annex 2).

WHO and partners have made recommendations for a public health approach to preventing and treating HIV and other sexually transmitted infections among men who have sex with men and transgender people (13,14).

This package of interventions<sup>1</sup> covers the key areas in which action is needed to develop comprehensive and effective responses, including recommendations on human rights and non-discrimination in health care settings, on HIV prevention, treatment and care and on prevention and care for other sexually transmitted infections. Studies have shown positive effects of these interventions among men who have sex with men, and recent modelling suggests that these interventions may also positively affect the number of people newly infected among the general population (15).

Improving access to and uptake of prevention, treatment and care services among men who have sex with men requires supplementing health sector interventions with structural interventions to address stigma and discrimination (Box 6.3). Legal and policy barriers play a key role in the vulnerability of men who have sex with men and transgender people to HIV. Laws and policies that promote universal access and gender

1 Guidelines provide evidence and technical recommendations on: 1) preventing sexual transmission, 2) HIV testing and counselling, 3) behavioural interventions and information, education, communication, 4) substance use and prevention of bloodborne infections, 5) HIV care and treatment and 6) prevention and care for other sexually transmitted infections (15).



equality in principle may fail for men who have sex with men in practice, where homophobic cultural, religious or political forces are active and where criminalization of same-sex behaviour exists (15). It is thus essential to address legal constraints and cultural norms that prevent access to services and discourage health-seeking behaviour.

A total of 113 low- and middle-income countries reported information on the existence of programmes engaging men who have sex with men (Table 6.4). The most commonly reported interventions were HIV testing and counselling, available in 84 countries, followed by antiretroviral therapy and care, available

in 80 countries. Internet-based interventions, hepatitis B screening and vaccination and harm reduction programmes were reported less frequently and were available in only 33, 23 and 15 countries, respectively.

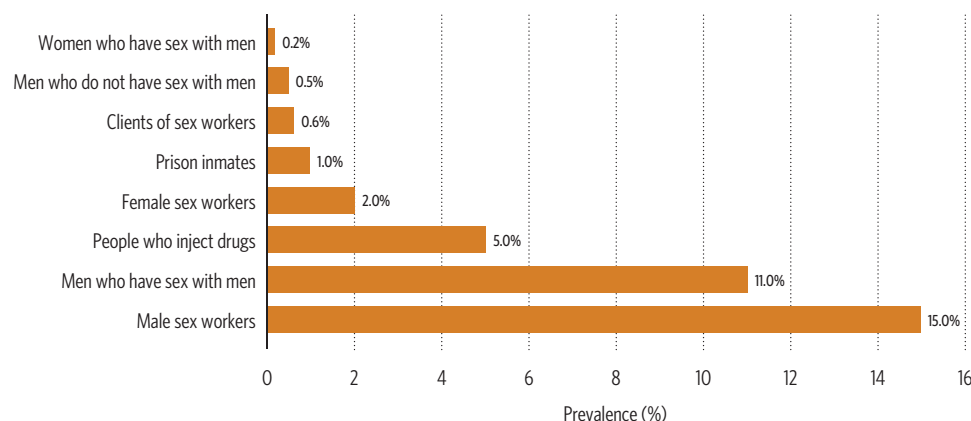
Regionally, the availability of interventions engaging men who have sex with men is higher in Latin America and the Caribbean, in Europe and Central Asia and in East, South and South-East Asia. Despite evidence indicating high HIV prevalence among men who have sex with men in sub-Saharan Africa, the availability of targeted interventions was generally lowest in this region (see Chapter 1).

### Box 6.3

#### Scaling-up a comprehensive HIV response among men who have sex with men in Mexico

Mexico has a concentrated HIV epidemic affecting predominantly key populations at higher risk of HIV infection (Fig. 6.1). At the end of 2010, an estimated total of 225 000 people were living with HIV, with 143 281 people with AIDS and about 102 000 total deaths. Sex among men has been estimated as the main mode of transmission in the country, accounting for about 59% of all the cumulative people infected with HIV.

**Fig. 6.1** Estimated HIV prevalence by key population, Mexico, 2008–2009



Direct comparisons between HIV prevalence may not be appropriate because of differences in sampling methods and populations surveyed.

Since 2007, the National Center for AIDS Prevention and Control in Mexico (CENSIDA) has invested more than US\$ 15 million through nongovernmental organizations to finance prevention activities and strategies focusing on men who have sex with men. The federal government currently distributes around 25–30 million male condoms per year, mostly for men who have sex with men and other key populations at higher risk for HIV infection, along with an additional 60–80 million condoms through state-level programs for specific population groups. In 2011, Mexico started to implement a five-year, US\$ 64 million project supported by the Global Fund to Fight AIDS, Tuberculosis and Malaria in 44 cities with the highest cumulative HIV incidence among men who have sex with men. It will promote HIV testing and counselling, distribute condoms and lubricants and implement peer workshops for behaviour change.

Before 2003, immediate access to antiretroviral therapy depended on insurance provided by health social welfare institutions linked to formal employment, and waiting lines were frequent for uninsured people. In addition, antiretroviral therapy was restricted to women, children and “family men”, thus excluding men who have sex with men, transgender people, sex workers and people who inject drugs. However, universal access to antiretroviral therapy was introduced in 2003, and implementation was completed in 2008–2009. Now all people with a medical indication for antiretroviral therapy in accordance with national treatment guidelines (CD4 cell count at or below 350 cells/mm<sup>3</sup>) are immediately enrolled in care and antiretroviral therapy, although late diagnosis remains an important issue among men who have sex with men.

Stigma and homophobia are still prevalent in many sectors of Mexican society and have been identified as major obstacles to accessing health care, prevention and early diagnosis of HIV. The National AIDS Programme has introduced a full-fledged training process to raise awareness and sensitize health personnel working at centres that provide direct HIV services to prevent discrimination, stigma, homophobia and transphobia. CENSIDA has also launched mass media and face-to-face seasonal campaigns, called “Homophobia is OUT”, as well as specific activities with the gay community to actively promote community involvement. Approaches have been developed to leverage the power of social networks and mass media to support changes in social norms. This combination of strategies is expected to promote healthy behaviour outcomes and contribute to the ultimate elimination of stigma and discrimination in the long term.

**Table 6.4** Number of low- and middle-income countries (of 149 countries surveyed) reporting the availability of interventions for HIV prevention, treatment and care among men who have sex with men

	Promoting consistent condom use <sup>a</sup>	Individual- and community-level interventions	Prevention interventions in sex venues	Social marketing campaigns	Internet-based intervention	HIV testing and counselling	HIV treatment and care	Sexually transmitted infection management, <sup>b</sup> including screening for asymptomatic gonorrhoea, chlamydia and syphilis	Hepatitis B vaccination	Comprehensive package of interventions for men who have sex with men who inject drugs
Total number of countries reporting	113	110	110	111	109	113	113	109	109	107
Number of countries reporting this intervention	79	70	55	48	33	84	80	60	23	15
East, South and South-East Asia										
Yes	20	20	12	14	8	24	22	21	7	2
No	6	6	14	12	18	2	4	5	19	24
Europe and Central Asia										
Yes	16	14	13	9	12	17	17	11	7	5
No	3	4	4	9	5	2	2	6	10	11
Latin America and the Caribbean										
Yes	20	15	18	14	7	19	19	13	4	3
No	1	4	3	7	14	2	2	8	17	17
North Africa and the Middle East										
Yes	7	7	4	3	3	8	8	4	2	2
No	4	4	6	7	7	3	3	6	8	8
Sub-Saharan Africa										
Yes	16	14	8	8	3	16	16	11	3	3
No	20	22	28	28	32	20	20	24	32	32

a This indicator may underestimate the availability of condom programmes, since it may not include non-targeted programming from non-public providers.

b Includes screening for asymptomatic *Neisseria gonorrhoeae* infection, *Chlamydia trachomatis* infection and syphilis.

### 6.2.3 Sex workers

A total of 113 low- and middle-income countries reported information on the existence of programmes and policies engaging sex workers<sup>1</sup> (Table 6.5). Similar to men who have sex with men, the most commonly available targeted intervention was HIV testing and counselling, reported by 101 of the 113 countries. HIV treatment and care were available in 100 countries and symptomatic treatment of sexually transmitted infections in 94 countries. The least commonly reported intervention was access to a package of interventions for sex workers who also inject drugs.

Regional variation was considerable. In East, South and South-East Asia, all reporting countries indicated making available targeted services for HIV testing and counselling, HIV treatment and care and treatment of symptomatic sexually transmitted infections. In contrast, availability was substantially more limited in

North Africa and the Middle East, where at least one quarter of the reporting countries indicating having no targeted interventions for sex workers.

Despite the availability of interventions for STI management among sex workers, syphilis prevalence remains high in several regions of the world (Box 6.4). The reported prevalence of active syphilis was over 15% in countries such as Argentina, Guinea-Bissau, Mongolia, Nicaragua, and Papua New Guinea (Annex 1).

Sex workers are also often subject to the effects of harmful legislation and human rights violations, which include coercion, stigma, poor access to information and prevention services and frequent exposure to violence. Structural interventions, including decriminalizing sex work and involving sex workers in planning and implementing interventions, are necessary to reduce social vulnerability and improve the access to and uptake of essential HIV interventions.

1 Most data refer to female sex workers.

**Table 6.5** Number of low- and middle-income countries (of 149 countries surveyed) reporting the availability of interventions for the prevention, treatment and care of HIV among sex workers

	Targeted condom programming <sup>a</sup>	HIV testing and counselling	HIV treatment and care	Treating symptomatic sexually transmitted infections	Treating asymptomatic sexually transmitted infections	Periodic presumptive treatment of sexually transmitted infections <sup>b</sup>	Access to a package for people who inject drugs	Empowerment of sex workers <sup>c</sup>
Total number of countries reporting	113	113	112	109	109	109	109	109
Number of countries reporting this intervention	95	101	100	94	64	34	16	74
East, South and South-East Asia								
Yes	24	26	25	26	19	10	4	20
No	2	0	0	0	7	16	22	5
Europe and Central Asia								
Yes	15	17	18	13	9	4	4	8
No	4	2	1	4	7	10	12	7
Latin America and the Caribbean								
Yes	19	20	19	18	12	6	2	16
No	2	1	2	3	9	15	17	5
North Africa and the Middle East								
Yes	7	8	8	6	4	1	2	3
No	4	3	3	4	6	9	8	7
Sub-Saharan Africa								
Yes	30	30	30	31	20	13	4	27
No	6	6	6	4	16	22	31	8

a This indicator may underestimate the availability of condom programmes, since it may not include non-targeted programming from non-public providers.

b Or syndromic management of sexually transmitted infections in accordance with recent guidelines (13).

c Participation in planning and implementation of HIV and sexually transmitted infection prevention and care activities.

## Box 6.4

### Preventing and managing sexually transmitted infections among sex workers and men who have sex with men<sup>1</sup>

Among 149 low- and middle-income countries surveyed in 2010, 40 (27%) submitted data on the percentage of sex workers with active syphilis and 31 (21%) on the percentage of men who have sex with men with active syphilis. The reporting level was similar in 2008 (Table 6.6).<sup>2</sup>

The overall median percentage of sex workers with active syphilis among reporting countries was 3.8% in 2010. Active syphilis was highest among sex workers in Latin America and the Caribbean, at 5.1%, and lowest in sub-Saharan Africa, at 2.4%.

The overall median percentage of men who have sex with men with active syphilis among reporting countries, at 6.4% in 2010, was slightly higher than among sex workers. Latin America and the Caribbean had the highest reported positivity, reaching 13.1%, and East, South and South-East Asia the lowest, with 5.0%. Annex 1 provides detailed country data on indicators related to sexually transmitted infections for 2010.

**Table 6.6 Median positivity of active syphilis among sex workers and men who have sex with men in 149 countries surveyed, 2008 and 2010**

Region	Sex workers				Men who have sex with men			
	Number of countries reporting in 2008	Median positivity of active syphilis in 2008	Number of countries reporting in 2010	Median positivity of active syphilis in 2010	Number of countries reporting in 2008	Median positivity of active syphilis in 2008	Number of countries reporting in 2010	Median positivity of active syphilis in 2010
East, South and South-East Asia	13	2.7%	14	2.9%	11	3.3%	12	5.0%
Europe and Central Asia	8	13.2%	3	<sup>a</sup>	8	3.8%	3	<sup>a</sup>
Latin America and the Caribbean	8	7.7%	11	5.1%	7	7.8%	12	13.1%
North Africa and the Middle East	4	<sup>a</sup>	2	<sup>a</sup>	2	<sup>a</sup>	1	<sup>a</sup>
Sub-Saharan Africa	9	7.1%	10	2.4%	3	<sup>a</sup>	3	<sup>a</sup>
Global total	42	6.9%	40	3.8%	31	4.1%	31	6.4%

<sup>a</sup> Regional medians are not calculated if fewer than five countries provided data.

Trends cannot yet be assessed over time because limited longitudinal data are available across a comparable sample. However, as the breadth and robustness of monitoring and evaluation systems improve and more countries contribute data, more and higher-quality information on services and interventions related to sexually transmitted infections for these populations is expected to become available.

<sup>1</sup> Chapter 7 discusses three indicators addressing sexually transmitted infections among antenatal care attendees.

<sup>2</sup> "Active" syphilis was defined in this context as a positive result on both treponemal and non-treponemal tests.

## 6.3 Knowledge of serostatus among key populations at higher risk of HIV infection

As the gateway to other HIV services, improving knowledge of serostatus among populations at higher risk of HIV infection is essential in implementing comprehensive HIV responses and identifying inequity in the access to HIV services.

Table 6.7 summarizes data reported by countries on the uptake of testing and counselling by people who inject drugs, men who have sex with men and sex workers. Substantially more countries were able to report on

testing coverage among sex workers than among men who have sex with men or people who inject drugs. In addition, although coverage of HIV testing remained generally low across populations and regions, it was relatively higher among sex workers than among men who have sex with men and people who inject drugs.

Globally, 52 countries reported data on HIV testing and counselling among sex workers versus 45 in 2008. The median proportion of sex workers who knew their status from a recent HIV test was 49%, with considerable country variability. Knowledge of serostatus among sex workers reached a median of 60% in sub-Saharan Africa (16 countries, range 0–95%) and 59% in Latin

**Table 6.7** Percentage of selected key populations at higher risk of HIV infection who received an HIV test in the last 12 months and who know the results, 2008–2010<sup>a</sup>

	People who inject drugs	Men who have sex with men	Sex workers
Overall median	23%	32%	49%
Total number of countries reporting ( <i>n</i> =)	26	41	52
East, South and South-East Asia			
Median	21%	27%	35%
<i>n</i> =	11	14	17
Europe and Central Asia			
Median	26%	31%	42%
<i>n</i> =	9	11	8
Latin America and the Caribbean			
Median	...	32%	59%
<i>n</i> =	2	11	10
North Africa and the Middle East			
Median	...	...	...
<i>n</i> =	2	1	2
Sub-Saharan Africa			
Median	...	...	60%
<i>n</i> =	2	4	15

<sup>a</sup> Annexes 3A.1, 3A.2 and 3A.3 provide detailed country data. Country data may have been generated through surveys that are not nationally representative, and some survey results may overestimate the proportion of people accessing services. For instance, where reported coverage is close to 100%, they may represent people enrolled in treatment services or other settings where an HIV test is required to access the service.

America and the Caribbean (10 countries, range 18–75%), and 35% in East, South and South-East Asia (17 countries, range 14–98%).

Forty-one countries provided data on the uptake of HIV testing and counselling among men who have sex with men. Overall, median coverage was 32% and highest in Latin America and the Caribbean, at 32% (range 7–63%), followed by Europe and Central Asia at 31% (range 4–60%). In a group of 26 reporting countries, a median of only 23% of people who inject drugs had received an HIV test in the past 12 months and knew the results. Europe and Central Asia had the highest median coverage of testing and counselling among people who inject drugs, with 26%, followed by East, South and South-East Asia, with 21%.

Establishing clear regional or global time trends in scaling up HIV testing and counselling across countries is challenging because the sample sizes of available surveys are generally small, and many may not adequately reflect rapid changes that may take place over a short period of time. Nevertheless, the overall direction of change can be gauged by comparing data reported by countries that have conducted more than one survey from 2006 to 2010 (Table 6.8).

**Table 6.8** Median percentage of selected key populations at higher risk of HIV infection who received an HIV test in the last 12 months and who know the results, 2006–2008 and 2009–2010

	2006–2008	2009–2010
People who inject drugs		
Median	23%	25%
<i>n</i> =	13	
Men who have sex with men		
Median	30%	35%
<i>n</i> =	16	
Sex workers		
Median	39%	52%
<i>n</i> =	23	

<sup>a</sup> Annexes 3A.1, 3A.2 and 3A.3 provide detailed country data. Country data may have been generated through surveys that are not nationally representative, and some survey results may overestimate the proportion of people accessing services. For instance, where reported coverage is close to 100%, they may represent people enrolled in treatment services or other settings where an HIV test is required to access the service.

*n* = Number of countries reporting

Available figures suggest that the median uptake of HIV testing and counselling has increased among sex workers between 2006–2008 and 2009–2010, from 39% to 52% among 23 reporting countries, with notable regional improvements in reported proportions observed in sub-Saharan Africa, from 49% (range 34–

71%) to 60% (range 38–89%); East, South and South-East Asia, from 19% (range 5–68%) to 33% (range 14–98%); and in Europe and Central Asia, where the median proportion of sex workers who reported receiving a recent HIV test and learned their results increased from 45% (range 31–68%) to 59% (range 23–59%).

Longitudinal data on men who have sex with men and people who inject drugs are more limited and show that the median uptake of HIV testing and counselling in the past 12 months grew more modestly among men who have sex with men between 2006–2008 and 2009–2010, from 30% to 35% (16 reporting countries), and among people who inject drugs from 23% to 25% (13 reporting countries). Such low levels underscore the need for greater investment to monitor access to and increase the uptake of HIV testing and counselling by these population groups.

#### 6.4 Treatment and care for key populations at higher risk of HIV infection

Despite improving epidemiological surveillance, limited disaggregated data are available globally on access to antiretroviral therapy by sex workers, men who have sex with men and people who inject drugs. Nevertheless, progress has been made in Europe and Central Asia towards consistently collecting figures on antiretroviral therapy uptake by mode of transmission, including through injecting drug use.

This is especially noteworthy given the key role of injecting drug use in the region’s epidemiological dynamics and scientific evidence that indicates that providing antiretroviral therapy to this population has individual and population-wide health benefits (16). Such data are also important to identify gaps in service coverage and to design policies to ensure equitable access to HIV treatment. Using HIV surveillance (case reporting) figures and data from antiretroviral therapy programmes, the WHO Regional Office for Europe has also assessed the extent to which people who inject drugs in the region have access to antiretroviral therapy and how these patterns have changed over time.

Data collected through standardized annual reporting between 2002 and 2010 show that uneven progress has been made towards ensuring that people who inject drugs have access to antiretroviral therapy in the region’s low- and middle-income countries.

Comparing the proportion of HIV cases caused by injecting drug use with the corresponding proportion of people receiving antiretroviral therapy who inject drugs, in 2002, 71% of the reported people living with HIV acquired HIV infection through injecting drug use, whereas only 20% of those receiving antiretroviral therapy were people who injected drugs.<sup>1</sup> In 2005 and 2006, among 21 and 23 countries with available data, people who injected drugs represented 77% of reported cases and 26% of antiretroviral therapy recipients, a proportion that declined to 22% in 2010 among 19 reporting countries.

Although no trends can be statistically ascertained due to incomparable samples (notably missing data from the Russian Federation in 2002 and 2010), these data suggest that most of the people who acquire HIV infection in reporting countries are people who inject drugs and that, despite this, their treatment needs remain considerably underserved (Table 6.9). These findings are corroborated by recent research that shows that in five countries – China, Malaysia, Russian Federation, Ukraine and Viet Nam – people who inject drugs comprised 67% of the cumulative people living with HIV in 2008 but only 25% of those receiving antiretroviral therapy (17).

<sup>1</sup> Comprehensive estimates of antiretroviral therapy needs for people who inject drugs are not available.

**Table 6.9 Proportion of people who inject drugs receiving antiretroviral therapy in low- and middle-income countries in Europe and Central Asia, 2002–2010**

	2002	2005	2006	2010 <sup>a</sup>
Number of reporting countries among 26 low- and middle-income countries surveyed	17	21	23	19
HIV cases among people who inject drugs (% among cumulative reported HIV cases with a known transmission route)	46 052 (71%)	221 849 (77%)	249 982 (77%)	185 565 (62%)
People who inject drugs receiving antiretroviral therapy (% among the total reported people receiving antiretroviral therapy with a known route of transmission)	130 (20%)	4 670 (26%)	5 275 (26%)	7 646 (22%)

<sup>a</sup> 2009 HIV case-reporting data.

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# Scaling up HIV services for women and children: towards eliminating mother-to-child transmission and improving maternal and child health in the context of HIV

## KEY FINDINGS

National political commitments to expand HIV prevention, treatment, care and support services for women and children intensified in 2010. The global plan to eliminate new HIV infections among children and improve the health of mothers set ambitious targets for 2015, including reducing the number of children newly infected with HIV by 90%, reducing the number of women dying from HIV-associated causes during pregnancy, delivery and postpartum by 50% and reducing the mother-to-child transmission of HIV to less than 5%.

In 2010, 35% of pregnant women in low- and middle-income countries received HIV testing and counselling, up from 26% in 2009. In sub-Saharan Africa, the region with the highest number of pregnant women living with HIV, coverage increased from 35% to 42%, with especially high rates of increase in countries in eastern and southern Africa (from 52% to 61%).

In 2010, the coverage of pregnant women receiving the most effective regimens for preventing mother-to-child transmission (excluding single-dose nevirapine) is an estimated 48% [44–54%].

Among the 22 priority countries for eliminating mother-to-child transmission, 5 reached the 2001 UNGASS goal of providing antiretroviral medicine (excluding single-dose nevirapine) for preventing mother-to-child transmission to 80% of pregnant women living with HIV in need: Botswana, Lesotho, Namibia, South Africa and Swaziland.

Among the estimated 1.49 million infants born to mothers living with HIV, 42% [38–48%] received antiretroviral medicine to prevent HIV transmission from their mothers, up from 32% [29–36%] in 2009.

The coverage of HIV interventions for infants and children is improving but remains low. Among 65 reporting countries, only 28% [24–30%] of infants born to mothers living with HIV received an HIV test within the first two months of life. Only 23% [19–24%] of HIV-exposed children in 87 reporting countries received co-trimoxazole prophylaxis within two months of birth in 2010. The number of children receiving antiretroviral therapy increased from an estimated 354 600 in 2009 to 456 000 in 2010, but the coverage for the estimated 2 020 000 [1 800 000–2 300 000] children in need is only 23% [20–25%], much lower than the 51% [48–54%] coverage of antiretroviral therapy among adults.



A global consensus emerged during the past year on the need for and feasibility of substantially reducing the number of children newly infected with HIV and improving the health of mothers and children to accelerate progress towards achieving the related Millennium Development Goals,<sup>1</sup> including Millennium Development Goal 6 on HIV/AIDS. The updated 2010 WHO guidelines on antiretroviral medicine to treat pregnant women and prevent HIV infection among infants (1), combined with a renewed commitment to delivering comprehensive services for preventing mother-to-child transmission, define approaches to considerably reducing the rates of HIV transmission, making eliminating mother-to-child transmission an achievable goal even in resource-limited settings.<sup>2</sup> In June 2010, under the leadership of the Executive Directors of UNICEF and UNAIDS and the Director-General of WHO, United Nations agencies and key global partners committed to work towards eliminating the mother-to-child transmission of HIV by 2015. The world leaders gathered at the United Nations General Assembly High-level Meeting on AIDS in June 2011 further endorsed this goal by adopting the Political Declaration on HIV/AIDS (3).

### 7.1 Global Plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive

At the United Nations General Assembly High-level Meeting on AIDS in June 2011, the United Nations Secretary-General launched the Global Plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive (4), which lays out key actions needed at both the global and country level to expedite progress toward these goals.<sup>3</sup> The Global

1 Millennium Development Goal 4: Reduce child mortality (with a target of reducing the mortality rate among children younger than five years by two thirds between 2009 and 2015); Millennium Development Goal 5: Improve maternal health (with targets of reducing by three quarters the maternal mortality ratio and achieving universal access to reproductive health by 2015).

2 A technical consultation convened by WHO and partners in Geneva in November 2010 defined elimination of mother-to-child transmission as "achieving less than a 5% transmission rate of HIV from mother to child at the population level and a 90% reduction of infections among young children by 2015, from a 2009 baseline" (2).

3 A high-level Global Task Team, co-chaired by the UNAIDS Executive Director and the United States Global AIDS Coordinator, was established to support the development of a global plan to structure partner engagement towards eliminating the mother-to-child transmission of HIV. The Global Task Team comprises 25 countries and 30 civil society organizations, private sector organizations, networks of people living with HIV and international organizations.

#### Box 7.1

##### The 22 priority countries for eliminating mother-to-child transmission

Angola  
Botswana  
Burundi  
Cameroon  
Chad  
Côte d'Ivoire  
Democratic Republic of the Congo  
Ethiopia  
Ghana  
India  
Kenya  
Lesotho  
Malawi  
Mozambique  
Namibia  
Nigeria  
South Africa  
Swaziland  
Uganda  
United Republic of Tanzania  
Zambia  
Zimbabwe

#### Box 7.2

##### The Global Plan's country implementation actions towards eliminating new HIV infections among children and keeping their mothers alive: 10-point plan

- 1 Conduct a strategic assessment of key barriers.
- 2 Develop or revise nationally owned plans and cost them.
- 3 Assess the available resources and develop a strategy to address unmet needs.
- 4 Implement and create demand for a comprehensive, integrated package of HIV prevention and treatment interventions and services.
- 5 Strengthen synergies and integration fit to context between HIV prevention and treatment and related health services to improve maternal and child health outcomes.
- 6 Enhance the supply and utilization of human resources for health.
- 7 Evaluate and improve access to essential medicines and diagnostics and strengthen supply chain operations.
- 8 Strengthen community involvement and communication.
- 9 Better coordinate technical support to enhance service delivery.
- 10 Improve outcomes assessment, data quality, and impact assessment.

Source: Global Plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive (4).

**Box 7.3****Regional initiatives towards eliminating new HIV infections among children**

Region	Main features of each regional initiative
Europe	<ul style="list-style-type: none"> <li>• The Strategic Framework for the Prevention of HIV Infections in Infants in Europe (6) set targets to prevent children from acquiring HIV infections, with high-level political commitment.</li> <li>• The regional plan (6) supports universal coverage of HIV testing during pregnancy and promotes access to interventions for preventing mother-to-child transmission for people who inject drugs.</li> <li>• The first regional progress report towards eliminating mother-to-child transmission was published in January 2011 (10).</li> <li>• The European Action Plan for HIV/AIDS 2012-2015 (7) aims to reduce vertical transmission to less than 2% among children who are not breastfeeding populations and to less than 5% among children who are breastfeeding by 2015.</li> </ul>
Americas	<ul style="list-style-type: none"> <li>• A dual initiative to eliminate congenital syphilis and mother-to-child transmission of HIV was adopted in 2009 (11).</li> <li>• A regional monitoring strategy was published in 2010 (8).</li> <li>• The first progress report is scheduled to be released soon (12).</li> </ul>
Asia-Pacific	<ul style="list-style-type: none"> <li>• A dual elimination initiative was launched in August 2011: <i>Elimination of new paediatric HIV infections and congenital syphilis in Asia-Pacific 2011-2015: conceptual framework and monitoring and evaluation guide</i> (9).</li> <li>• The regional plan supports a common systematic approach to dual elimination and outlines a strategy that HIV, sexually transmitted infection and maternal, newborn and child health programmes in the region can adapt to develop country-specific operational plans.</li> </ul>
Africa	<ul style="list-style-type: none"> <li>• This region has the highest burden of HIV.</li> <li>• A strategic regional framework towards the elimination of new HIV infections among children and keeping mothers alive was reviewed in October 2011, and the regional plan for coordinated agency responses to support the implementation of the strategic framework was finalized.</li> <li>• The regional plan for eastern and southern Africa will be launched in December 2011.</li> </ul>

Plan (4) recognizes the need to better integrate HIV interventions with broader maternal, newborn and child health programmes to expand coverage, ensure the sustainability of service delivery and ultimately improve the survival of mothers and children in countries with a high burden of HIV. Within the Global Plan, 22 countries (India and 21 countries in sub-Saharan Africa), which account for nearly 90% of pregnant women living with HIV, have been identified as priority countries for intensified support (Boxes 7.1 and 7.2) (5).

### 7.1.2 Regional initiatives towards eliminating new HIV infections among children

Regional initiatives have been launched to galvanize efforts and accelerate progress towards achieving the goals set out in the Global Plan (Box 7.3). Regional plans have already been released in the European Region (6,7), Region of the Americas (8) and Asia-Pacific regions (9) and are currently being developed in the African Region (Box 7.3). Each initiative recognizes the unique regional epidemic and challenges that need to be addressed to eliminate new HIV infections among children. Some have also been integrated with initiatives for eliminating congenital syphilis (Box 7.7).

### 7.1.3 Tracking the progress of the Global Plan

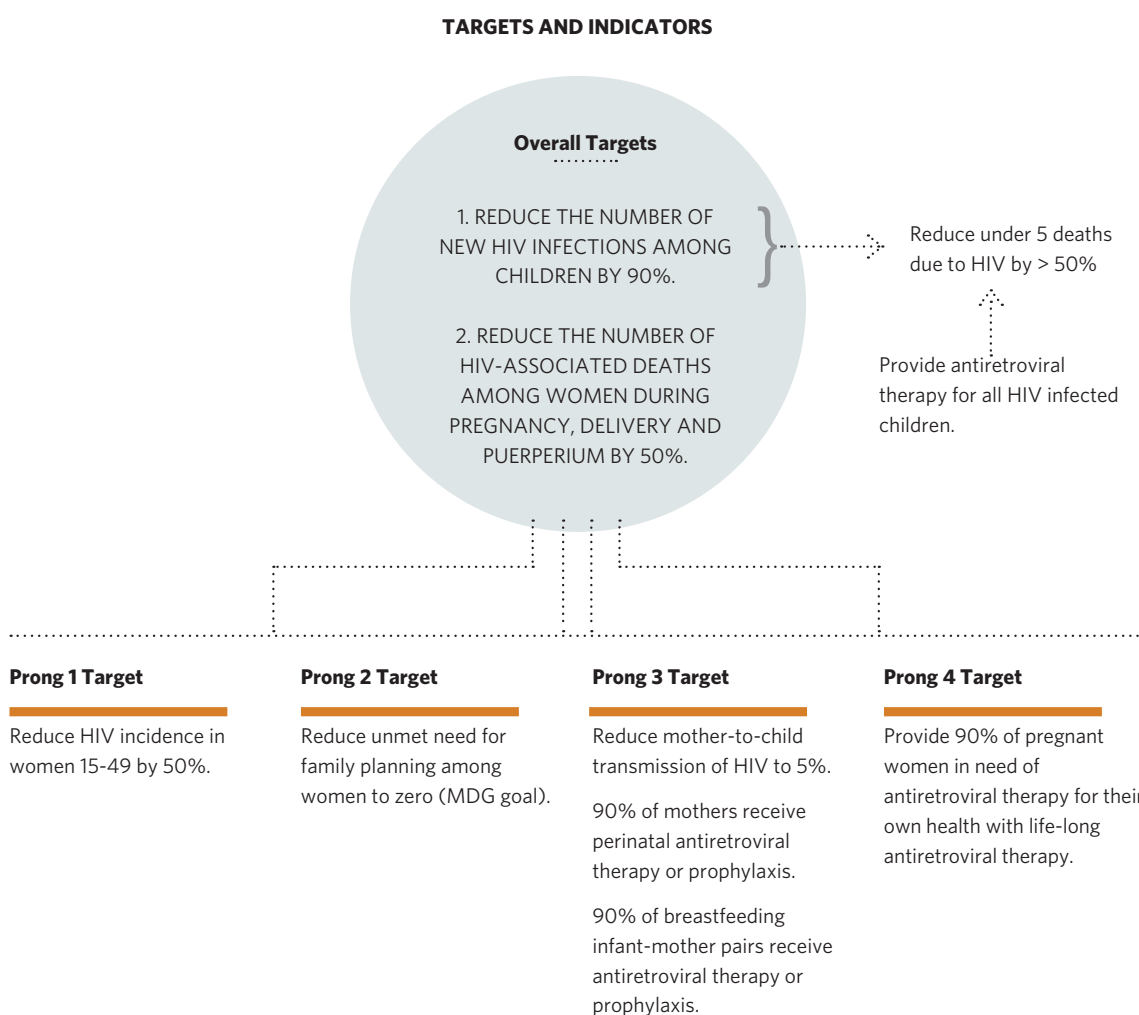
Accountability and shared responsibility for results at the community, country, regional, and global levels are central components of the Global Plan (4), which incorporates the four *prongs* of the comprehensive approach recommended by the United Nations to reduce the mother-to-child transmission of HIV (13):

1. primary prevention of HIV infection among women of childbearing age;
2. preventing unintended pregnancies among women living with HIV;
3. preventing HIV transmission from pregnant women living with HIV to their infants; and
4. providing appropriate treatment, care and support to mothers living with HIV and their children and families.

The Global Plan (4) includes 10 ambitious targets for 2015 to monitor progress on its objectives (Fig. 7.1).

This report provides the global baseline figures that will be used to monitor progress towards the Global Plan targets (Annex 7 provides data on the 22 priority countries). Updates against these baseline numbers will be provided annually (Boxes 7.4 and 7.5).

**Fig. 7.1** Monitoring framework of the Global Plan



Source: Countdown to zero: Global Plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive 2011-2015 (4).

## Box 7.4

### Global Plan indicators, baselines and targets

Table 7.1 summarizes the main indicators included in the Global Plan (4), along with their 2009 baseline values, 2015 targets and progress in 2010 for low- and middle- income countries.

**Table 7.1 Monitoring the Global Plan: main indicators, 2009 baseline figures, 2015 targets and progress made in 2010 in low- and middle-income countries**

Areas to monitor	2009	2010	2015 target
Number of women living with HIV delivering	1 490 000 <sup>a</sup>	1 490 000	743 000 <sup>b</sup>
<b>Overall target:</b> Number of new paediatric HIV infections	430 000	390 000	<43 000
<b>Overall target:</b> HIV-associated deaths among women during pregnancy, delivery and puerperium	42 000 <sup>c</sup>	Not available	21 000
<b>Prong 1 target:</b> New HIV infections in women aged 15-49	1 070 000 <sup>a</sup>	1 050 000	535 000
<b>Prong 2 target:</b> Unmet family planning need among women 15-49 years old	11% <sup>d</sup>	Not available	0
<b>Prong 3, target 3.1:</b> Mother-to-child HIV transmission rate	29% <sup>a</sup>	26%	<5%
<b>Prong 3, target 3.2:</b> Maternal antiretroviral (prophylaxis and therapy) coverage	48% <sup>e</sup> (including single-dose nevirapine)	48% <sup>f</sup> (excluding single-dose nevirapine)	90%
<b>Prong 3, target 3.3:</b> Antiretroviral coverage among breastfeeding women	Not available <sup>g</sup>	Not available	90%
<b>Prong 4 target:</b> Antiretroviral therapy coverage among eligible pregnant women living with HIV	Not available	34%	90%
<b>Child target:</b> Deaths due to HIV among children under 5 years	162 000 <sup>h</sup>	Not available	<81 000
<b>Child target:</b> Coverage of antiretroviral therapy among children	21%	23%	100%

a Current estimates for 2009,UNAIDS.

b A 50% reduction in the number of deliveries among pregnant women living with HIV along with a reduction from 27% to 5% in mother-to-child transmission will result in a 90% reduction in the number of children newly infected. This is not an official target.

c 2008 value (14).

d 2009 estimate for low- and middle-income countries (15,16). The baseline is 25% for sub-Saharan Africa.

e The coverage data include provision of only single-dose nevirapine, which is no longer recommended by WHO (17).

f The coverage data include only the most efficient regimens as recommended by WHO (excluding single-dose nevirapine).

g Comprehensive data are not yet available because the provision of antiretroviral medicine during the breastfeeding period became an international recommendation in 2010.

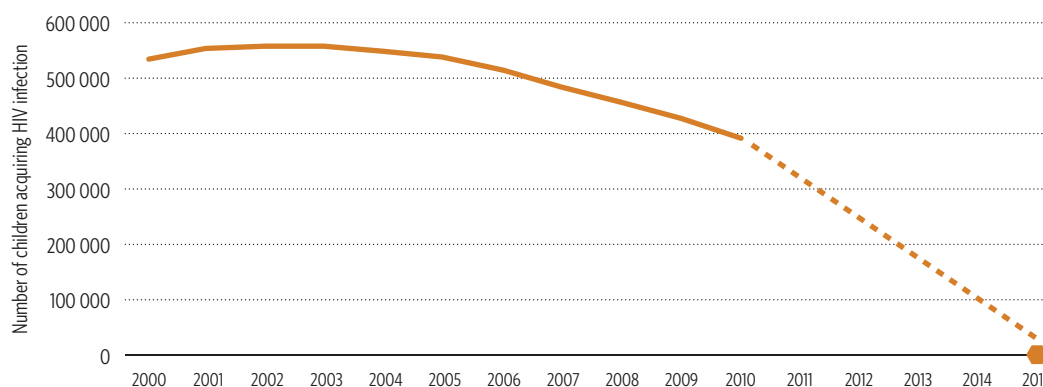
h Source: World health statistics 2011 (18).

### Box 7.5

#### Reaching the goal of reducing the number of children newly infected with HIV by 90% requires concerted action on all four prongs

Fig. 7.2 shows the estimated number of children who acquired HIV infection from mother-to-child transmission between 2000 and 2009. The Global Plan (4) target is to reduce the number of children acquiring HIV infection by 90%, from 429 000 in 2009 (the baseline) to 43 000 in 2015.

**Fig. 7.2** Estimated number of children newly infected with HIV in low- and middle-income countries, 2000–2015



Mathematical modelling shows that eliminating mother-to-child transmission requires simultaneously implementing all four prongs of the United Nations comprehensive approach to preventing mother-to-child transmission (19).

## 7.2 Preventing HIV infection among women of reproductive age

Preventing women of reproductive age from acquiring HIV infection is critical to achieving the two high-level targets of the Global Plan: reducing the number of children newly infected with HIV by 90% and reducing the number of mothers dying from AIDS-related causes by 50%.

The Global Plan also establishes a 50% reduction in the number of women 15–49 years old acquiring HIV infection by 2015 as the main target for Prong 1. Achieving this target requires converging robust and focused combination prevention strategies. Ensuring that women remain HIV-negative will also improve the survival of mothers. Globally, HIV is a major cause of death among women of childbearing age and contributes significantly to mothers dying (20).

In 2010, an estimated 1 490 000 [1 300 000–1 600 000] women living with HIV were pregnant. This number has remained relatively stable since 2005. Although the global number of people newly infected

with HIV has declined, in sub-Saharan Africa, the region with the largest number of pregnant women living with HIV, the estimated number of pregnant women living with HIV was 1 400 000 [1 300 000–1 600 000] in 2005 and declined slightly to 1 360 000 [1 200 000–1 500 000] in 2010. In several priority countries for preventing mother-to-child transmission, the incidence of HIV infection among adults fell by 50% or more between 2001 and 2009, including in Botswana, Zimbabwe, Côte d'Ivoire and Namibia (21).

Young women have an especially high risk of acquiring HIV infection. In 2010, about 3.2 million women 15–24 years old were living with HIV, including more than 1.1 million living in South Africa and Nigeria in 2009. Evidence shows that the prevalence of HIV infection among young women in sub-Saharan Africa is disproportionately higher than among young men. The discrepancy is most stark in sub-Saharan Africa where, in 2010, 71% of the people 15–24 years old living with HIV were women (22) (see Chapter 2). Eliminating new HIV infections among children requires ensuring that HIV prevention services reach this population and keep adolescent girls HIV-negative.

### 7.2.1 Strategies for primary prevention of HIV infection among women of reproductive age

Programmes to prevent the mother-to-child transmission of HIV, delivered in the context of maternal, newborn and child health services, represent an important entry point to provide information on HIV prevention to women of reproductive age. Provider-initiated testing and counselling and testing and counselling for couples delivered through programmes for preventing mother-to-child transmission contribute significantly to primary prevention by increasing knowledge of HIV status in the general population of women of reproductive age and, increasingly, among male partners (23). Based on the evidence of high rates of HIV seroconversion during pregnancy and the early postpartum period (24), HIV prevention counselling for HIV-negative pregnant women in early pregnancy is particularly important. Other evidence-informed HIV prevention interventions include: social and behaviour change communication; abstinence from sex and injecting drug use; condom use; medical male circumcision; harm reduction; and the emerging area of antiretroviral therapy (22).

Ensuring comprehensive, correct knowledge about how to prevent HIV transmission is a critical first step towards reducing the number of people acquiring HIV infection. In sub-Saharan Africa, the region that accounted for 74% of the people 15–24 years old acquiring HIV infection globally in 2010, only 26% (22) of young women had comprehensive, correct knowledge

about HIV prevention versus 33% of young men. Within sub-Saharan Africa, the proportion is higher in eastern and southern Africa (34%) and lower in western and central Africa (20%).

Although comprehensive knowledge about HIV prevention is still generally low throughout the region, several priority countries for preventing mother-to-child transmission have made important progress towards improving this among women 15–24 years old. Improvements have been observed in Mozambique, from 20% (2003) to 36% (2009); in Kenya, from 34% (2003) to 48% (2008–2009); and in Lesotho, from 26% (2004) to 39% (2009) (25). Fewer young women have comprehensive knowledge of HIV prevention in Asia (17% in South Asia and 24% in East Asia and the Pacific) than in sub-Saharan Africa.

#### HIV testing

Antenatal care is a critical opportunity for both pregnant women and their partners to receive HIV testing and counselling. This is particularly important in sub-Saharan Africa, where about half the people living with HIV are in a long-term sexual relationship with an HIV-negative partner (26). Couples testing and counselling in settings for preventing mother-to-child transmission is an important strategy for reaching male partners with HIV testing and counselling, helping HIV-negative women and men remain negative and reducing the risk of transmission in serodiscordant couples. Couples testing and counselling may also improve

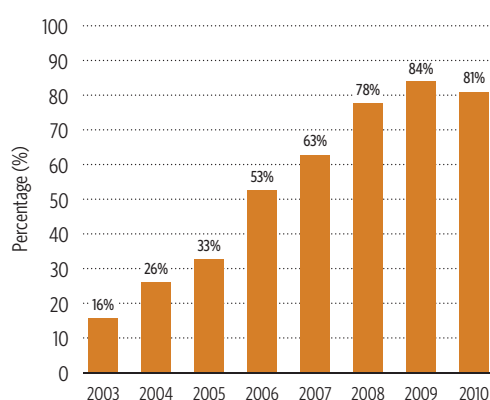
#### Box 7.6

##### Involving male partners is central to Rwanda's strategy for eliminating the mother-to-child transmission of HIV

By embracing a family-centred approach to comprehensive services for preventing mother-to-child transmission, Rwanda has been able to substantially improve the participation of male partners in preventing mother-to-child transmission as part of a gender-sensitive transformation of its health system. National strategies encouraging male partners to participate in HIV counselling and testing in antenatal care services have been supported by high-level political commitment and are bearing fruit. In 2010, 81% of pregnant women who were tested for HIV through the national programme for preventing mother-to-child transmission had male partners who also tested for HIV within the past 12 months, many of whom were tested with their partner as part of antenatal care (Fig. 7.3).

It is also essential to consider how HIV testing strategies in antenatal care services can best address the needs of young people who, although sexually active, are often not in stable relationships. Data on antenatal care are currently not disaggregated by age in many countries, thereby limiting the ability to determine the proportions of young people accessing HIV testing and counselling in antenatal care services.

Fig. 7.3 HIV testing and counselling of male partners during antenatal care, Rwanda, 2003–2010



adherence to antiretroviral therapy and to interventions for preventing mother-to-child transmission (see Chapter 4) (27).

Though couples testing in antenatal care is often encouraged, uptake among male partners is still generally limited; among 37 countries providing data on the uptake of HIV testing and counselling among male partners of women attending antenatal care, 20 countries reported uptake levels of less than 5%, although it reached 81% in Rwanda (Box 7.6).

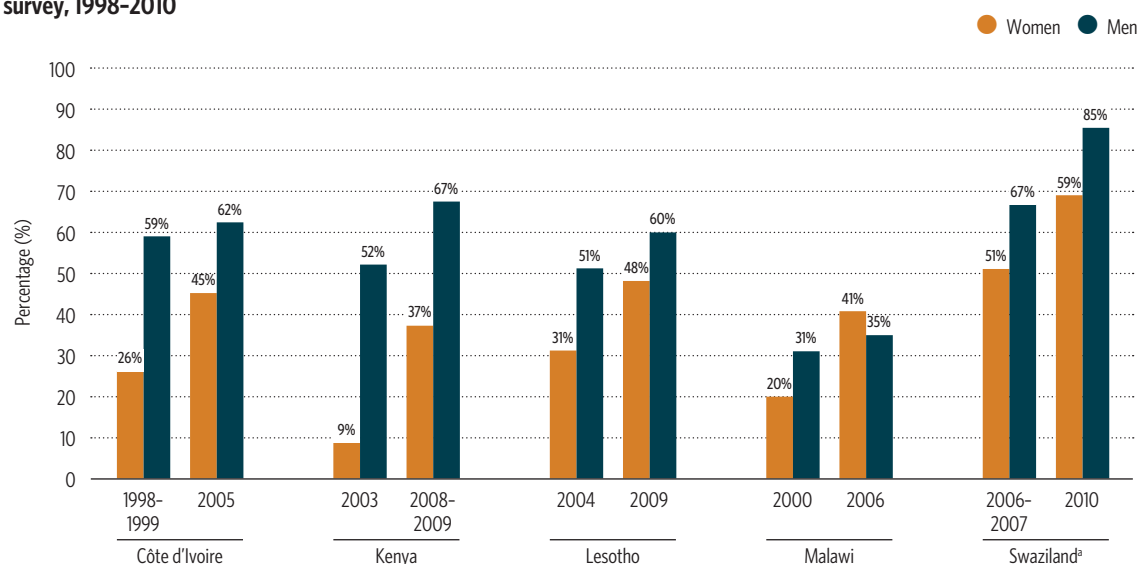
### Select primary prevention methods

Condom use among women 15–24 years old who had more than one sexual partner in the past year has increased in some countries with high HIV prevalence (Fig. 7.4). However, the rates of condom use among

young people are still generally low across regions, with young men reporting higher rates of condom use than young women.

New studies published in 2010 and 2011 (Table 3.4) have added two important new tools to the array of effective prevention technologies. Antiretroviral therapy has been shown to greatly reduce the risk of HIV transmission, and topical and oral antiretroviral pre-exposure prophylaxis, including an antiretroviral-based microbicide for women, can lower the risk of acquiring HIV among HIV-negative individuals. These methods (see Chapter 3) are expected to be able to considerably strengthen the primary prevention of HIV infection among women of reproductive age and can help further reduce the number of these women who are newly infected with HIV.

**Fig. 7.4** Percentage of people 15–24 years old who had more than one sexual partner in the past 12 months reporting the use of a condom during their last sexual intercourse, by selected countries that had trend data for men and women in the same survey, 1998–2010



Sources: MEASURE DHS: all surveys by country [web site] (25). Demographic and Health Surveys: Côte d'Ivoire 1998–1999; Kenya, 2003 and 2008–2009; Lesotho, 2004 and 2009; Malawi, 2000; Swaziland, 2006–2007. AIDS Indicator Surveys: Côte d'Ivoire, 2005.

Multiple Cluster Indicator Survey [web site] (28). Multiple Cluster Indicator Surveys: Malawi, 2006; Swaziland, 2010.

a The data for women in Swaziland from the 2006–2007 Demographic and Health Survey (25) are based on small denominators (typically 25–49 unweighted cases).

## Box 7.7

### Towards eliminating congenital syphilis

Untreated syphilis in pregnancy leads to adverse outcomes among more than half the women with active disease, including early fetal loss, stillbirth, prematurity, low birth weight, neonatal and infant death and congenital disease among newborn babies. Similarly to HIV, syphilis in pregnancy is usually sexually transmitted, and testing for syphilis early in pregnancy and immediately treating women found to be positive are effective and cost-effective interventions even in low-prevalence settings (29). Testing pregnant women and their partners for syphilis is also an important measure to support the primary prevention of HIV infection, as active syphilis can increase the risk of transmitting and acquiring HIV (30,31). New rapid syphilis testing technology now enables syphilis and HIV testing to be offered jointly through an integrated approach in nearly any antenatal care setting.

WHO, UNICEF, UNFPA, UNAIDS and other partners support the global initiative to eliminate congenital syphilis. The Americas and the Asia-Pacific region and several countries have developed integrated initiatives to eliminate the mother-to-child transmission of both HIV and syphilis, given their common target groups and service delivery platforms (8,9).

According to the most recent (2008) estimates, about 1.9 million pregnant women had active syphilis. Assuming moderate coverage of syphilis testing and treatment in pregnancy, in 2008 there were an estimated 300 000 stillbirths or early fetal losses, 140 000 neonatal deaths and 380 000 infants that were preterm, of low birth weight or had congenital disease associated with syphilis (8).

In 2010, 63 low- and middle-income countries reported on the proportion of women attending antenatal care tested for syphilis at the first visit. In this subgroup, 17 low- and middle-income countries reported having achieved the global target of testing at least 90% of women attending antenatal care at the first visit for syphilis (7) (Belize, Chile, Cuba, Fiji, Gabon, Grenada, Guyana, Kiribati, Malaysia, Mauritius, Namibia, Oman, Samoa, Seychelles, Sri Lanka, Uruguay and Venezuela (Bolivarian Republic of)). Overall global median testing coverage did not improve from 2008 to 2010 (Table 7.2). Nevertheless, median testing coverage improved in Latin America and the Caribbean (from 73% in 2008 to 80% in 2010) and in East, South and South-East Asia (from 52% to 78%). In 27 reporting countries from sub-Saharan Africa, a median of only 59% of pregnant women were tested for syphilis. Eight low- and middle-income countries reported not offering routine syphilis screening in antenatal care in 2010.

**Table 7.2** Number of low- and middle-income countries reporting and median proportion of women attending antenatal care tested for syphilis at the first visit and seropositive for syphilis, 2008 and 2010<sup>a</sup>

Region	% of women attending antenatal care tested for syphilis at the first visit				% of women attending antenatal care seropositive for syphilis			
	2008		2010		2008		2010	
	Number reporting <sup>b</sup>	Median (%)	Number reporting <sup>b</sup>	Median (%)	Number reporting <sup>b</sup>	Median (%)	Number reporting <sup>b</sup>	Median (%)
East, South and South-East Asia	7	52%	12	78%	14	0.5%	16	0.5%
Eastern Europe and Central Asia	9	100%	c	c	9	0.3%	2	a
Latin America and the Caribbean	14	73%	20	80%	14	0.9%	20	1.3%
North Africa and the Middle East	2	a	4	a	5	0.0%	3	a
Sub-Saharan Africa	19	64%	27	59%	30	2.3%	34	1.6%
<b>Total</b>	<b>51</b>	<b>78%</b>	<b>63</b>	<b>68%</b>	<b>72</b>	<b>1.3%</b>	<b>75</b>	<b>1.3%</b>

a Regional values are not calculated when fewer than 5 countries reported.

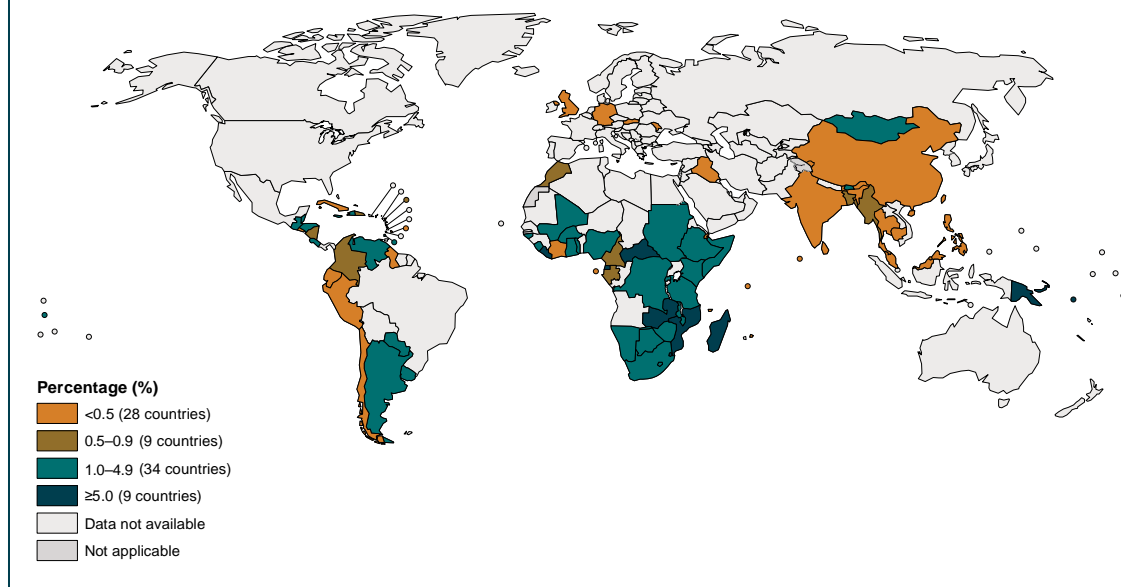
b Number of low- and middle-income countries requested to report: 149.

c This indicator was not included in universal access reporting for Eastern Europe and Central Asia in 2010.



In 2010, 75 (of 149) low- and middle-income countries surveyed provided data on the prevalence of syphilis among antenatal care attendees; the global median was 1.3% for 2010, with a high of 1.6% in sub-Saharan Africa. Country and regional variability was high: the Central African Republic, Equatorial Guinea, Liberia, Madagascar, Mozambique, Papua New Guinea, the Solomon Islands, Swaziland and Zambia all reported antenatal care syphilis prevalence rates above 5% in 2010 (Fig. 7.5 and Annex 1).

**Fig. 7.5 Syphilis seropositivity of women attending antenatal care reported by countries in 2010**



### 7.3 Preventing unintended pregnancies among women living with HIV

Globally, an estimated 80 million (38%) of the 211 million pregnancies each year are unintended (32). According to *World contraceptive use 2011* (15), the level of unmet family planning need among the 1.18 billion women 15–49 years old is an estimated 11% globally.<sup>1</sup> Among the 128 million women (married or in a union) 15–49 years old in sub-Saharan Africa, the estimated unmet need for family planning is more than twice as high, at 25%.

Unintended pregnancies have important harmful effects on the survival and well-being of both women and their children. A lower total fertility rate through increased contraceptive use has been shown to reduce by up to 15% the number of mothers dying than would have occurred with no fertility decline (33). In addition, the benefits of family planning include increased family

savings and productivity, better prospects for education and employment and improvement in the status of women (15). Current contraception levels prevent 188 million unintended pregnancies, which results in 112 million fewer abortions, 1.1 million fewer newborns dying and 150 000 fewer mothers dying (34,35).

One of the targets of the Millennium Development Goals, agreed by all United Nations Member States, is to achieve, by 2015, universal access to reproductive health, including family planning (36). To accelerate progress towards this goal, the Global Plan (4) also aims to reduce the unmet need for family planning to zero by 2015 (37). In this context, the United Nations Secretary-General’s Global Strategy for Women’s and Children’s Health and the HANDtoHAND campaign will target 100 million new people for accepting family planning by 2015 (38).

Women living with HIV who know their HIV-positive status need sexual and reproductive health services to make informed decisions about their future reproductive life, including when to seek support and services to prevent unintended pregnancies. The use

<sup>1</sup> “Unmet need for family planning” refers to the number of women who are fecund and sexually active but are not using any method of contraception and report not wanting any more children or wanting to delay the birth of their next child.

of modern contraceptive methods is a cost-effective means of preventing transmission because of any unintended pregnancy and to promote healthy birth spacing (39–42).

Fewer unintended pregnancies among women living with HIV mean fewer infants born to them, resulting in fewer infants exposed to HIV and potentially living with HIV (42,43). Modelling has demonstrated that the mother-to-child transmission of HIV cannot be eliminated without reducing unintended pregnancies among women living with HIV (19). However, limited data are available on the access to and uptake of family planning services among women living with HIV at the population level (Box 7.9); most data focus on the family planning practices among women of reproductive age without disaggregating based on serostatus.

Addressing unmet family planning needs is essential for all women, regardless of their serostatus. As such, services should not exclusively focus on women living with HIV. Nevertheless, in some countries people living with HIV have greater unmet need. In Uganda, a recently published survey (47) found significantly greater

unmet need for family planning among people living with HIV than among HIV-negative people (75% versus 34%). In other countries, women living with HIV have lower unmet need than HIV-negative women (Box 7.8).

Unintended pregnancy among women living with HIV may elevate the risk of both mother-to-child transmission and the abandonment of infants, especially among marginalized women (such as people who inject drugs and illegal migrants) who may not access antenatal care, HIV services (such as antiretroviral therapy or services for preventing mother-to-child transmission) or access to safe abortion. Unintended pregnancy rates are likely to be high among people who inject drugs, who have low rates of effective contraception use.

A study of postnatal women living with HIV in Ukraine (48,49) highlighted the unmet need for contraception among women living with HIV in this setting: 23% had not planned their most recent pregnancy, 20% were not currently using any family planning method (although some of these women reported not being sexually active at the time) and a further 20% were using

### Box 7.8

#### Family planning needs among women living with HIV

Recent household surveys that collect data on HIV status and fertility preferences enable the unmet need for family planning among women living with HIV to be estimated. The unmet family planning need among women living with HIV is compared with unmet need among other women, using data from six recent surveys (Kenya, Lesotho, Malawi, Swaziland, Zambia and Zimbabwe) that included questions on both HIV testing and fertility preferences (44–47). Data analysis from these surveys was limited to women who reported knowing their HIV status, since they are more likely to adapt their fertility preferences based on this knowledge.

**Table 7.3 Unmet need for family planning by HIV serostatus based on data from Demographic and Health Surveys in six countries**

Country and year of survey	Unmet need among women living with HIV	Unmet need among HIV-negative women	Change in unmet need over time among all women
Kenya 2008	21%	21%	25% (2003) to 26% (2008)
Lesotho 2009	16%	18%	31% (2004) to 23% (2009)
Malawi 2010	18%	21%	28% (2004) to 26% (2010)
Swaziland 2007	12%	14%	No comparison available
Zambia 2007 <sup>a</sup>	14%	20%	27% (2002) to 27% (2007)
Zimbabwe 2006	14%	8%	13% (1999) to 12% (2006)

Sources: UNAIDS calculations of data from Demographic and Health Surveys (MEASURE DHS: all surveys by country [web site] (25)) and Millennium Development Goals indicators [web site] (36).  
 a The difference between women living with HIV and HIV-negative women is statistically significant.

Unmet need is lower for women living with HIV than for HIV-negative women in 5 of the 6 countries. In Zambia, the difference was statistically significant. (Table 7.3).

Overall, the unmet need for family planning in the general population in these countries has been stable in recent years. The only countries in which unmet need has declined among the general population are Lesotho and Malawi, and in both countries, the unmet need is lower among women living with HIV who reported knowing their status. For the women living with HIV, special efforts should be made to ensure they have the resources to meet their fertility preferences.

non-effective methods (such as coitus interruptus). Further, the most important factor associated with lack of postnatal contraception was affordability, despite the national policy of providing contraception free of charge.

Moreover, many women living with HIV still do not know their HIV status (Box 7.9). Since many people who inject drugs have a large gap in information about their HIV status, addressing the broader problem of many unintended pregnancies requires better monitoring and providing key interventions to all women. The desired outcome is to eliminate unintended pregnancies, including among women living with HIV. Family planning, delivered as part of universal access to reproductive health, is a key intervention in this regard (20).

A strategic framework has been finalized in support of the Global Plan to strengthen policies and programming for prong 1 – the primary prevention of HIV among women of reproductive age, emphasizing pregnant and breastfeeding women – and prong 2 – preventing unintended pregnancies among women living with HIV. Although the framework focuses predominantly on the health sector, it supports the integration of sexual and reproductive health and HIV services (especially maternal, newborn and child health, family planning and HIV treatment) and a robust human rights-based platform for providing services. Concerted action on both prongs is essential to improve the health of mothers and children and to eliminate new HIV infections among children.

#### Box 7.9

##### Knowledge of HIV status among pregnant women living with HIV

In 2011, 12 of the 22 priority countries for preventing mother-to-child transmission reported data on pregnant women known to be living with HIV at the first antenatal care visit. About 23% of pregnant women attending antenatal care were reported to have known their HIV-positive status before their first antenatal care visit, and 77% were found to be HIV-positive at the visit. In some countries, 40% or more of pregnant women living with HIV attending antenatal care knew their status before the first antenatal care visit, including in Botswana (61%), Namibia (49%), Swaziland (46%) and Lesotho (40%).

## 7.4 Preventing the vertical transmission of HIV and improving the health of pregnant women living with HIV

### 7.4.1 HIV testing and counselling among pregnant women

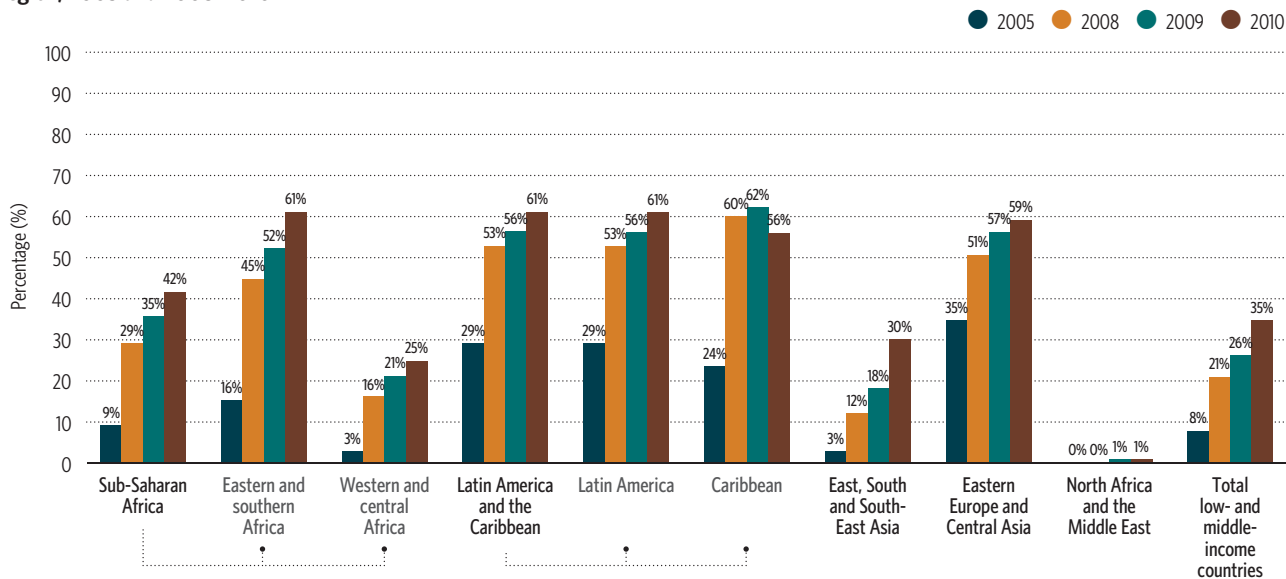
High-quality and timely HIV testing and counselling are essential to identify pregnant women living with HIV who can benefit from HIV care and from interventions to reduce the risk of transmitting HIV from mother to child (Fig. 7.6).

In 2010, an estimated 35% of the estimated 123 million pregnant women in low- and middle-income countries received an HIV test, up from 26% in 2009, 21% in 2008 and 8% in 2005. The percentage increased in almost all regions, growing around 10 percentage points or more between 2009 and 2010 in eastern and southern Africa (52% to 61%) and East, South and South-East Asia (18% to 30%). Although progress has been significant in almost all regions, nearly two thirds of pregnant women still do not know their HIV status, including many pregnant women living with HIV who could benefit from further health interventions such as lifelong care for HIV and interventions to reduce the mother-to-child transmission of HIV.

Of the 43 170 000 pregnant women estimated to have received an HIV test in low- and middle-income countries in 2010, 1 006 000 (2.3%) were reported to be living with HIV. This represents 68% of the estimated total of 1.49 million pregnant women living with HIV needing antiretroviral medicine to prevent the mother-to-child transmission of HIV. Although effort must be focused on identifying the remaining one third still unaware of their HIV status, ensuring that all pregnant women identified as living with HIV receive effective interventions for preventing mother-to-child transmission and links to HIV care and treatment is also critical. Additional important objectives include providing effective services at decentralized primary care settings, reaching women who do not access antenatal care and achieving universal coverage of testing and counselling in low-level and concentrated epidemics.

In some settings, the coverage of antenatal care is still low, and increasing access to antenatal care may be an effective way to expand the coverage of HIV testing and counselling among pregnant women living with HIV. In settings in which women do not access antenatal care or are not tested in antenatal care,

**Fig. 7.6** Estimated percentage of pregnant women who received an HIV test in the past 12 months in low- and middle-income countries by region, 2005 and 2008-2010



### Box 7.10

#### Promoting provider-initiated testing and counselling for pregnant women

Systematic HIV testing and counselling during pregnancy involves provider-initiated testing and counselling performed as early as possible to allow pregnant women to benefit from prevention, treatment and care and access to interventions to reduce transmission to their infants. In generalized epidemics, pregnant women testing HIV negative in the first or second trimester should be retested in the third trimester. For women who present during labour without having accessed antenatal care, HIV testing is recommended to all women of unknown status or as soon as possible after delivery. If an HIV test has not previously been done, HIV testing should be recommended to women in the postpartum period. In generalized epidemics, women who test HIV negative in the first or second trimester who have not had a repeat test during the third trimester or during labour should be recommended to retest immediately after delivery or as soon as possible in the postpartum period (57), preferably early to benefit from HIV-related services for themselves and their infant, including counselling on and support for infant feeding and diagnosis for the infant.

As of December 2010, 98 of 119 responding countries reported having policies or guidelines on provider-initiated testing and counselling for pregnant women.<sup>1</sup> However, even in countries with almost universal antenatal care coverage and a national policy of provider-initiated testing and counselling among all pregnant women, not all pregnant women are tested, and intensified efforts are needed to close the gap between policy and practice.

<sup>1</sup> In seven countries from Eastern Europe and Central Asia, provider-initiated testing and counselling for pregnant women was reported as mandatory. Provider-initiated testing and counselling as defined by WHO and UNAIDS is neither mandatory nor compulsory; pregnant women should receive counselling so they can give informed consent for an HIV test, thereby appreciating the significance of test results for themselves and their family.

testing at labour and delivery is recommended as a second opportunity to identify women living with HIV and offer at least part of the package of interventions for preventing mother-to-child transmission. In countries and settings in which almost all pregnant women attend antenatal care, provider-initiated testing and counselling has helped increase the number of pregnant women receiving an HIV test and knowing the result (Box 7.10) (see Chapter 4).

Eliminating the mother-to-child transmission of HIV requires identifying nearly all pregnant women living

with HIV. In 2010, the estimated coverage of HIV testing and counselling among pregnant women exceeded 50% in 13 of the 22 priority countries for eliminating mother-to-child transmission (section 7.1). The coverage of HIV testing and counselling among pregnant women in Botswana, South Africa, Zambia and Zimbabwe was estimated to exceed 90% in 2010. However, in Chad, the Democratic Republic of the Congo and Nigeria, less than 20% of the estimated number of pregnant women living with HIV received HIV testing and counselling (Table 7.4).

**Table 7.4** Estimated percentage of pregnant women tested for HIV in the 22 priority countries for eliminating mother-to-child transmission, 2005 and 2010

Country	Percentage of pregnant women tested for HIV	
	2005	2010
Angola	1%	32%
Botswana	92%	>95%
Burundi	2%	39%
Cameroon	17%	41%
Chad	Not available	7%
Côte d'Ivoire	6%	59%
Democratic Republic of the Congo	3%	11%
Ethiopia	2%	26%
Ghana	4%	68%
India	2%	23%
Kenya	31%	83%
Lesotho	9%	57%
Malawi	10%	66%
Mozambique	12%	87%
Namibia	46%	86%
Nigeria	1%	14%
South Africa	47%	>95%
Swaziland	39%	83%
Uganda	18%	63%
United Republic of Tanzania	14%	86%
Zambia	14%	94%
Zimbabwe	29%	90%

#### 7.4.2 Antiretroviral medicine to prevent the mother-to-child transmission of HIV

The 2010 WHO guidelines on the use of antiretroviral drugs for treating pregnant women and preventing HIV infection in infants (1) are based on two key approaches: (1) lifelong antiretroviral therapy for the pregnant women who need treatment for their own health, which is also safe and highly effective in reducing mother-to-child transmission; and (2) new options for antiretroviral prophylaxis to prevent mother-to-child transmission during pregnancy, delivery and breastfeeding for those who do not require treatment.

##### 7.4.2.1 Assessing the eligibility of pregnant women living with HIV to receive antiretroviral therapy for their own health

Pregnant women living with HIV should be clinically assessed (including CD4 testing) to determine whether they are eligible for antiretroviral therapy. As with all adults living with HIV, initiation of antiretroviral therapy is now recommended for all pregnant women

living with HIV with CD4 counts at or below 350 cells per mm<sup>3</sup>, regardless of WHO clinical staging, and for all pregnant women in WHO clinical stage 3 or 4, regardless of CD4 cell count. Initiating antiretroviral therapy among women eligible for treatment, before or during pregnancy, will help improve the mother's health and prevent mother-to-child transmission during the perinatal period and while breastfeeding. Giving the mother antiretroviral therapy is also the most effective way of reducing mother-to-child transmission. The introduction of point-of-care CD4 testing is a promising new approach that would help expand access to assessment of immune status.

In 2010, among 99 low- and middle-income countries reporting data (representing 81% of the estimated number of pregnant women living with HIV), an estimated 45% of pregnant women who were known to be living with HIV were assessed for their eligibility to receive antiretroviral therapy (either through clinical staging or CD4 cell count), versus 51% in 2009 and 34% in 2008. About 30% were assessed through CD4 count, versus 37% in 2009 and 24% reported in 2008.

Surprisingly, reported data showed a decrease in the percentage of women living with HIV assessed for eligibility for antiretroviral therapy. The causes for this should be investigated further as this may also be an artefact of reporting. In 2010, the number of women attending antenatal care already knowing that they were living with HIV was 11% higher than in 2009. When a pregnant women is already aware that she is living with HIV at her first antenatal clinic visit and is receiving HIV care in a different facility, some clinics may not record information on whether she has already been clinically assessed.

The gap between the number of pregnant women living with HIV who are aware of their serostatus and the number who are actually assessed for eligibility for antiretroviral therapy leads to missed opportunities to maximize health benefits for mothers and minimize the risk of transmitting HIV to their infants.

In 2010, an estimated 571 000 pregnant women living with HIV (38% of the pregnant women living with HIV needing antiretroviral medicine for preventing mother-to-child transmission) had CD4 counts at or below 350 cells per mm<sup>3</sup> and were thus eligible for antiretroviral therapy (based on modelled estimates). Among pregnant women who needed antiretroviral

therapy, 35% (197 000) received it. In most of the 22 priority countries for eliminating mother-to-child transmission, less than 50% of the estimated number of pregnant women eligible for antiretroviral therapy received it in 2010 (see Annex 7).

#### 7.4.2.2 Coverage of antiretroviral prophylaxis to prevent the mother-to-child transmission of HIV

For pregnant women living with HIV who are not eligible for treatment, WHO recommends two efficacious antiretroviral regimen options for prophylaxis to reduce transmission during the perinatal period and while breastfeeding. For the first time, antiretroviral medicine to either the mother or the infant is recommended throughout the breastfeeding period, in settings where breastfeeding is the safest option for feeding the infant.

For option A, the mother takes zidovudine during the antenatal period, starting from as early as 14 weeks of pregnancy. A single dose of nevirapine and lamivudine is added during labour, and zidovudine and lamivudine are continued for seven days after delivery as a “tail” to decrease the risk of nevirapine resistance. If the mother breastfeeds, the baby will receive nevirapine syrup from birth until one week after all exposure to breast-milk

has ended. If the mother is giving the baby replacement feeding, he or she will only get either nevirapine or zidovudine from birth until 4–6 weeks of age.

For option B, the mother takes a prophylaxis regimen consisting of three antiretroviral medicines during pregnancy, labour and after delivery until one week after all exposure to breast-milk has ended. Infants born to mothers on option B receive either nevirapine or zidovudine from birth until 4–6 weeks of age, regardless of their feeding method. WHO recommends four possible triple antiretroviral prophylaxis regimens for option B, with the choice of regimen to be made at the country level.

Importantly, a single dose of nevirapine is no longer recommended as a standard practice (Box 7.11).

One hundred and one (101) countries, representing 98% of the pregnant women living with HIV in low- and middle-income countries receiving any antiretroviral medicines for preventing mother to child transmission, reported disaggregated data on antiretroviral regimens.

The estimated coverage of most effective antiretroviral regimens for preventing the mother-to-child

#### Box 7.11

##### Phasing out single-dose nevirapine for preventing mother-to-child transmission

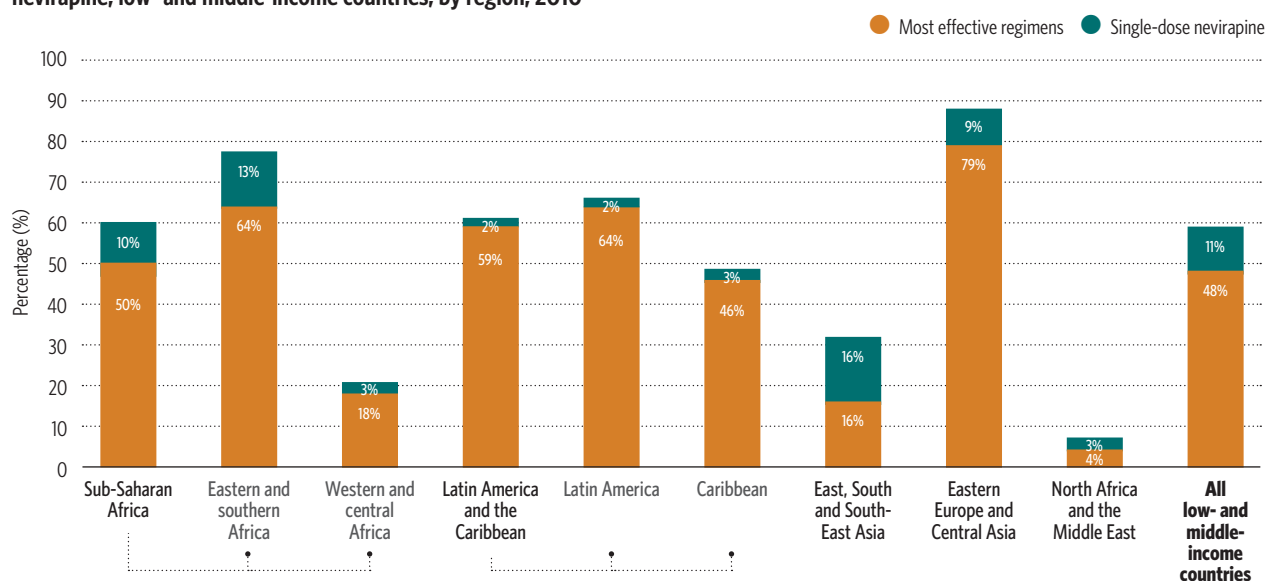
Single-dose nevirapine given to mothers during labour and to the infant at birth was one of the original short-course antiretroviral interventions, after it was shown to reduce the peripartum risk of HIV transmission to the infant by nearly 50% (50). This regimen was one of the least expensive and easiest to administer, and many early programmes for preventing mother-to-child transmission adopted it, especially in sub-Saharan Africa, soon after 2000. However, since more effective regimens were developed and became increasingly available, WHO guidelines on antiretroviral medicine for preventing the mother-to-child transmission of HIV progressively recommended shifting away from single-dose nevirapine towards more effective alternatives.

Beginning with the 2006 revision, single-dose nevirapine has not been recommended as a standard intervention for preventing mother-to-child transmission. This decision reflects evidence demonstrating that single-dose nevirapine does not protect against antenatal transmission or postpartum transmission during breastfeeding, and the risk of developing drug resistance is high in the mother and (if infected) the infant. The most recent 2010 guidelines on preventing mother-to-child transmission (7) now recommend more effective antiretroviral regimens for the mother or infant during breastfeeding.

Although single-dose nevirapine is no longer recommended as the primary regimen for preventing mother-to-child transmission in any country, some countries have only recently changed their guidelines to recommend more effective regimens (such as India and Zimbabwe), and single-dose nevirapine is still being used in some situations, with 33 countries reporting that women received only single-dose nevirapine in 2010.

Data on interventions for preventing mother-to-child transmission, including information on country policies and estimates on the disaggregated use of various regimens for preventing mother-to-child transmission, are crucial to track progress towards providing more effective regimens and fully phasing out single-dose nevirapine and to identify where programme and policy issues involving single-dose nevirapine still need to be addressed. WHO, UNAIDS and UNICEF strongly discourage the use of single-dose nevirapine as an intervention for preventing mother-to-child transmission, and many partner agencies are working with countries to assist in rapidly phasing out single-dose nevirapine. Progress towards fully phasing out single-dose nevirapine must be accelerated to safeguard the safety and health of babies and their mothers and to eliminate mother-to-child transmission by 2015.

**Fig 7.7 Coverage of antiretroviral medicine for preventing mother-to-child transmission: most effective regimens and single-dose nevirapine, low- and middle-income countries, by region, 2010<sup>a</sup>**



a Single-dose nevirapine is no longer recommended by WHO

**Table 7.5 Estimated number of women living with HIV receiving the most effective antiretroviral regimens for preventing mother-to-child transmission and coverages with most effective regimens and with single dose nevirapine, low- and middle-income countries, by geographical region, 2010<sup>a</sup>**

Geographical region	Number of pregnant women living with HIV receiving the most effective antiretroviral regimens (excluding single-dose nevirapine) for preventing mother-to-child transmission	Estimated number of pregnant women living with HIV who need antiretroviral medicine for preventing mother-to-child transmission	Estimated coverage with the most effective regimens, as recommended by WHO	Estimated coverage with single-dose nevirapine only (regimen no longer recommended by WHO)
Sub-Saharan Africa	674 000	1 360 000 [1 200 000-1 500 000]	<b>50% [45-56%]</b>	10%
Eastern and southern Africa	600 700	940 000 [840 000-1 000 000]	<b>64% [57-71%]</b>	13%
Western and central Africa	73 300	410 000 [360 000-470 000]	<b>18% [15-20%]</b>	3%
Latin America and the Caribbean	15 000	25 600 [17 000-33 000]	<b>59% [46-90%]</b>	2%
Latin America	11 700	18 300 [11 000-25 000]	<b>64% [47-95%]</b>	2%
Caribbean	3 300	7 300 [5 900-9 000]	<b>46% [37-57%]</b>	3%
East, South and South-East Asia	12 200	73 800 [53 000-95 000]	<b>16% [13-23%]</b>	16%
Europe and Central Asia	14 700	18 600 [15 000-22 000]	<b>79% [65-94%]</b>	9%
North Africa and the Middle East	600	14 200 [9 900-19 000]	<b>4% [3-6%]</b>	3%
<b>All low- and middle-income countries</b>	<b>716 500</b>	<b>1 490 000</b> <b>[1 300 000-1 600 000]</b>	<b>48% [44-54%]</b>	11%

Note: Some numbers do not add up because of rounding.

a Annex 6 provides country-specific data.

transmission of HIV in low- and middle-income countries was 48% [44-54%] in 2010. In addition, 11% pregnant women, more than 150 000, received single dose nevirapine, a regimen which is no longer recommended by WHO (Fig. 7.7 and table 7.5). The proportion trend analysis is limited as estimated coverage from previous years included single dose nevirapine (14% [13-16%] in 2005; 48% [43-54%] in 2008).

Progress on the coverage of antiretroviral medicine for preventing mother-to-child transmission at the national level can mask significant inequality within countries. For example, in Ukraine, the use of antiretroviral medicine for preventing mother-to-child transmission among people who inject drugs and other people, respectively, was: none 12% versus 5%; single-dose nevirapine only 27% versus 9%; zidovudine and single-dose nevirapine 45% versus 68%; and antiretroviral therapy 16% versus 18% (52).

The 2001 Declaration of Commitment on HIV/AIDS set a target of 80% coverage of antiretroviral medicine

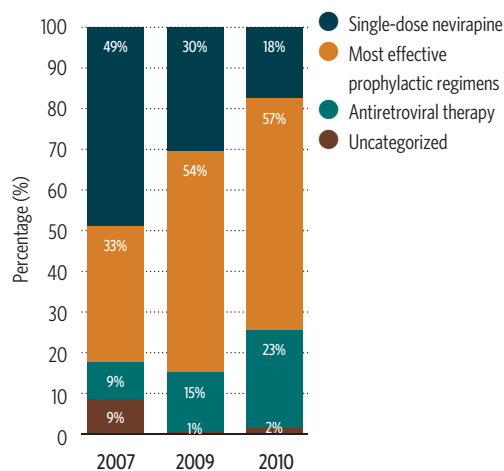
to reduce mother-to-child transmission by 2010. The target has nearly been achieved in Eastern Europe and Central Asia (with a coverage with the most efficient regimens) of 79%. In Eastern and southern Africa, the sub-region with the highest number of pregnant women living with HIV has achieved 64% coverage (Fig. 7.7 and Table 7.7). But, in addition, 13% of women only received a single dose of nevirapine instead of the most effective regimens recommended by WHO. Coverage remained low in western and central Africa (18%) and North Africa and the Middle East (4%) and in Asia (16%), where most women continue to receive only single-dose nevirapine.

#### Box 7.12

##### Antiretroviral regimens

Data from the 101 countries reporting disaggregated data show that the proportion of pregnant women living with HIV receiving only single-dose nevirapine decreased substantially between 2007 and 2010 (Fig. 7.8).

**Fig 7.8** Percentage distribution of various regimens provided to pregnant women who have received antiretroviral drugs to prevent mother-to-child transmission in low- and middle-income countries, 2007, 2009 and 2010



#### Box 7.13

##### Monitoring progress on providing antiretroviral medicine to prevent the mother-to-child transmission of HIV

Providing antiretroviral medicine to pregnant women living with HIV is a key intervention of programmes for preventing the mother-to-child transmission of HIV. However, at the national and global levels, accurately monitoring the number of women receiving antiretroviral medicine and the type of regimens received is challenging.

Women needing lifelong antiretroviral therapy may not access antiretroviral therapy at the same place where antiretroviral prophylaxis is provided, which can result in not including all relevant data on preventing mother-to-child transmission or double-counting when data from different sources are aggregated. When antiretroviral medicine is provided to the same woman or mother-child pair across various service delivery points (for example, at facilities providing antenatal care, labour and delivery services, child health services or HIV care and treatment services), data points may be double counted.

Data recording forms may not be able to collect the various types of regimens received, especially when antiretroviral guidelines may have recently been revised or if reporting to the subnational or national levels on the types of regimens delivered is not required, making it impossible to categorize the regimen provided, especially if a mix of regimens is being provided within a country. Thus, some countries may not have monitoring systems that allow the coverage of antiretroviral medicine for preventing mother-to-child transmission to be accurately recorded and reported.

In addition to improving existing monitoring mechanisms for adequately monitoring the provision of antiretroviral medicine for preventing mother-to-child transmission, the provision of antiretroviral medicine now needs to be monitored during the breastfeeding period, in accordance with the 2010 guidelines on antiretroviral medicine for preventing mother-to-child transmission (7). More work is needed at the country level, and as part of global reporting mechanisms, to standardize reporting of the types of regimens received by mother-baby pairs.



Only 12 countries reached the 80% coverage target (Table 7.6) with effective regimens among the estimated number of pregnant women living with HIV in need.<sup>1</sup>

Among the 22 priority countries for eliminating mother-to-child transmission, 5 (Botswana, Lesotho, Namibia, South Africa and Swaziland) exceeded 80% coverage in accordance with the latest international standards (Table 7.7). Several countries still have low coverage levels, and intensified efforts are needed to improve access to effective interventions.

The Global Plan (4) aims to increase the coverage of the most efficacious antiretroviral regimens for preventing

1 Among countries with at least 100 pregnant women estimated to need antiretroviral medicine for preventing mother-to-child transmission.

mother-to-child transmission to 90% by 2015, as 80% coverage (the UNGASS coverage target established in 2001) is insufficient to make substantial progress towards eliminating new HIV infections among children (19).

**Table 7.6 Low- and middle-income countries achieving the UNGASS target of coverage with effective regimens of antiretroviral medicine for preventing mother-to-child transmission (≥80%)**

Region	Number of countries <sup>a</sup>	Countries
Sub-Saharan Africa <sup>b</sup>	5	Botswana, Lesotho, Namibia, South Africa and Swaziland
Latin America and the Caribbean	4	Argentina, Brazil, Ecuador and Honduras
Eastern Europe and Central Asia	3	Belarus, Romania and Ukraine

a Countries with at least 100 pregnant women estimated to need antiretroviral medicine for preventing mother-to-child transmission.

b The 5 countries in this region are among the 22 priority countries for eliminating mother-to-child transmission.

**Table 7.7 Estimated antiretroviral coverage for preventing mother-to-child transmission in the 22 priority countries for eliminating mother-to-child transmission**

	Number of pregnant women living with HIV receiving most effective regimens to reduce the risk of mother-to-child transmission of HIV	Coverage with most effective regimens	Range	Number of pregnant women living with HIV receiving single-dose nevirapine to reduce the risk of mother-to-child transmission of HIV <sup>a</sup>
Angola	3 125	20%	[15-28%]	0 <sup>b</sup>
Botswana	14 641	>95%	[>95->95%]	0
Burundi	2 617	36%	[32-49%]	0
Cameroon	15 720	53%	[43-65%]	1 244
Chad	1 000	7%	[5-9%]	0
Côte d'Ivoire	11 561	66%	[54-79%]	0
Democratic Republic of the Congo	307	1%	[<1-1%]	3 064
Ethiopia	7 844	... <sup>c</sup>		0 <sup>b</sup>
Ghana	5 845	48%	[40-57%]	0 <sup>b</sup>
India	0 <sup>d</sup>	... <sup>c</sup>	... <sup>c</sup>	10 878
Kenya	41 378	43%	[37-49%]	24 554 <sup>e</sup>
Lesotho	12 370	89%	[77->95%]	0
Malawi	17 729	... <sup>c</sup>	[23-31%]	11 960
Mozambique	52 222	52%	[44-62%]	17 658
Namibia	7 790	>95%	[79->95%]	600
Nigeria	19 733	9%	[7-10%]	6 505 <sup>e</sup>
South Africa	250 072	>95%	[85->95%]	0
Swaziland	9 273	>95%	[88->95%]	0
Uganda	39 566	42%	[36-51%]	21 596
United Republic of Tanzania	58 161	59%	[52-68%]	22 897
Zambia	59 602	75%	[67-85%]	10 048
Zimbabwe	21 044	46%	[40-52%]	18 738

a Regimen not recommended by WHO.

b In Angola, Ethiopia and Ghana most regimens provided were not specified (100%, 86% and 100% respectively) and provision of single-dose nevirapine could therefore not be validated.

c No coverage can be presented, or only a range, as the estimated number of pregnant women living with HIV in need of antiretroviral medicine is currently being reviewed and will be adjusted, as appropriate, based on ongoing data collection and analysis.

d In 2010, India was still providing single-dose nevirapine but the country is currently updating its national guidelines.

e The single-dose nevirapine value has been readjusted: as the country also reported a number of women receiving an unspecified antiretroviral medicine, this has been proportionally added to the other reported regimens.

**Fig. 7.9 Countries with the largest contribution to the global gap in reaching 90% of pregnant women living with HIV in need with antiretroviral medicine for preventing mother-to-child transmission, 2010**

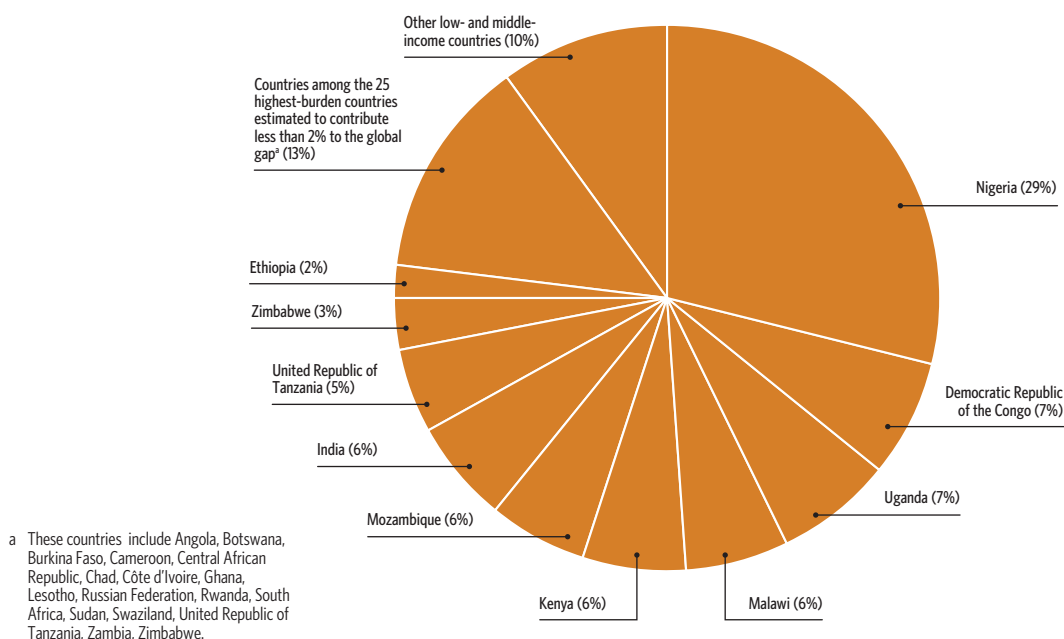


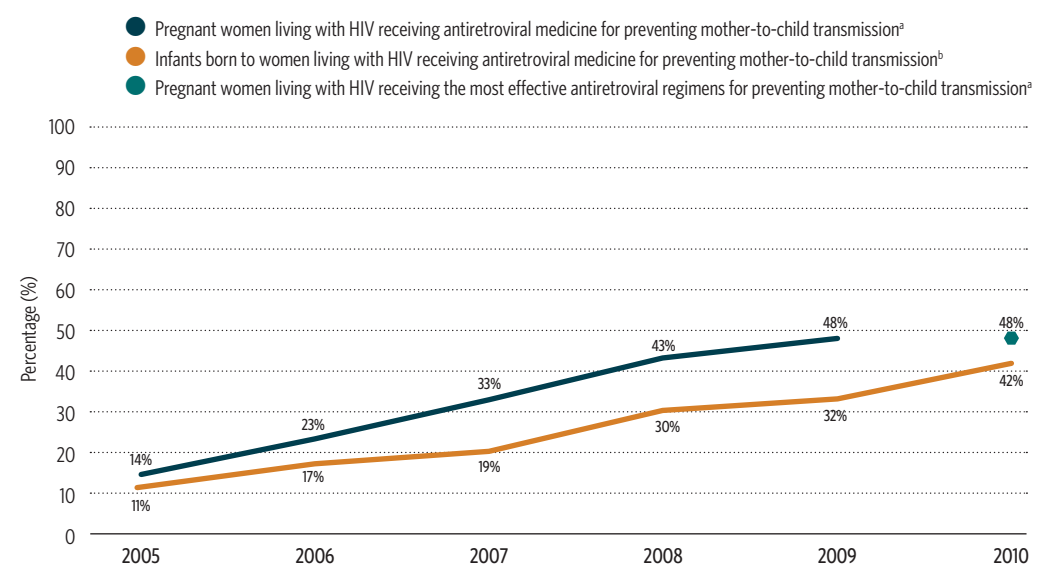
Fig. 7.9 depicts the 25 countries with the largest estimated number of pregnant women needing interventions for preventing mother-to-child transmission and their contribution to the global gap to reach 90% coverage of antiretroviral medicine for pregnant women living with HIV. The global gap is the difference between the current number of pregnant women in need who have access to antiretroviral medicine (with the most effective regimens) for preventing mother-to-child transmission and the estimated number who must be reached to achieve the 90% coverage goal. As Fig. 7.9 shows, four countries - Nigeria, the Democratic Republic of the Congo, Uganda and Malawi - accounted for nearly 50% of the gap in 2010.

### 7.4.3 Antiretroviral prophylaxis for infants born to mothers living with HIV

All infants born to mothers living with HIV should receive antiretroviral prophylaxis (1). This includes not just the short postpartum prophylaxis for 4–6 weeks recommended for all HIV-exposed infants, regardless of the regimen used for preventing mother-to-child transmission or of breastfeeding, but also extended antiretroviral therapy or other antiretroviral medicine for the mother or infant during breastfeeding. However, because of loss to follow-up, too few HIV-exposed infants receive the prophylaxis that they need to protect them from acquiring HIV infection.

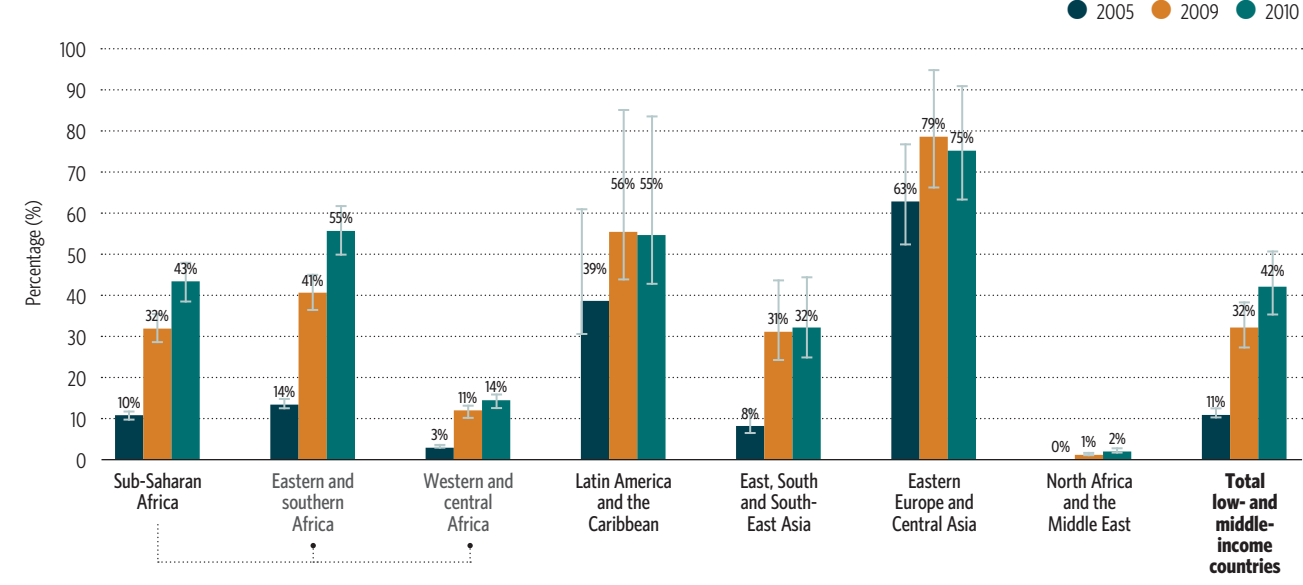
Current reporting on prophylaxis for infants, at least through 2010, reflects immediate postpartum prophylaxis for infants. Although the coverage of antiretroviral prophylaxis among infants was still less than the coverage among mothers in 2010, the reported coverage among infants increased between 2009 and 2010 from 32% [29–36%] to 42% [38–48%] of the estimated 1.49 million infants born to mothers living with HIV. Despite this increase, the gap between infants' and mothers' uptake of antiretroviral medicine is still substantial, suggesting problems with providing the postpartum prophylaxis to the infant, reporting on infant prophylaxis or early loss to follow-up of mother-infant pairs (Fig. 7.10). The coverage of antiretroviral prophylaxis among infants varies between regions and subregions, with Eastern Europe and Central Asia attaining the highest coverage in 2010, at 75% [63–91%], and coverage remaining lowest and relatively stagnant during the past year in western and central Africa at 14% [12–16%] (Fig. 7.11). In sub-Saharan Africa, coverage increased from 32% [28–36%] in 2009 to 43% [38–48%] in 2010. This increase was mostly driven by eastern and southern Africa, where coverage increased from 41% [36–45%] in 2009 to 55% [50–62%] in 2010. In Latin America and the Caribbean and South-East Asia, coverage remained about the same, at 55% [43–84%] and 32% [25–45%] in 2010 respectively.

**Fig 7.10** Percentage of pregnant women living with HIV and their infants who received antiretroviral medicine for preventing mother-to-child transmission, low- and middle-income countries, 2005-2010



a Coverage in 2010 cannot be compared with previous years as it does not include single-dose nevirapine which is no longer recommended by WHO.  
 b This includes only the initial (4-6 weeks) prophylaxis for infants.

**Fig 7.11** Percentage of infants born to pregnant women living with HIV who received antiretroviral prophylaxis for preventing mother-to-child transmission, 2005, 2009 and 2010



The bar indicates the uncertainty range around the estimate.

## Box 7.14

### Implementing new recommendations on HIV and infant feeding and monitoring progress

Since the WHO 2010 guidelines on HIV and infant feeding (53) were published, many countries, especially those in sub-Saharan Africa, have revised their national recommendations on infant-feeding practices by mothers living with HIV. At the end of December 2010, 93 (76%) of 123 responding low- and middle-income countries had decided to adopt and implement protocols to provide antiretroviral drugs after delivery.

WHO recommends two equally effective options (A and B: see section 7.4.2.2) to reduce transmission during the perinatal period and while breastfeeding.

Countries have varied in their choice of strategy for antiretroviral medicine for preventing HIV infection through breastfeeding. National authorities in Eastern Europe and Central Asia and South-East Asia have reviewed practices and recommendations.

Despite protocols that aim to increase the coverage of antiretroviral medicine and enable mothers living with HIV to breastfeed with a significantly diminished risk, adequately implementing these recommendations remains a major challenge. Very little information is available on antiretroviral medicine used during breastfeeding.

Routine health information systems have only recently begun to collect data on feeding practices of mothers living with HIV. Such data are essential to monitor progress on implementation in countries. The limited national-level data on infant-feeding practices related to exclusive breastfeeding in children younger than six months old suggest considerable variability in uptake, with levels ranging from 3% to 88% in the general population of the 22 priority countries for eliminating mother-to-child transmission.

Population-based surveys have generally not disaggregated infant-feeding practices by the mother's HIV status because the sample sizes of HIV-exposed infants are small in surveys. However, several countries, including Lesotho, South Africa and Zambia, have started or plan to prospectively collect data about infant-feeding practices when infants are immunized at about three months of age. As of 2012, countries are expected to be able to report more extensively on infant-feeding practices (such as exclusive breastfeeding, replacement feeding and mixed feeding) of HIV-exposed infants attending child clinics for DPT3 immunization and on the coverage of antiretroviral medicine among the HIV-exposed infants who are breastfeeding.

## 7.5 Treatment, care and support for children

A child can still acquire HIV even if a mother and her infant receive interventions for preventing the mother-to-child transmission of HIV. Early initiation of antiretroviral therapy will improve the health of children living with HIV and reduce morbidity and mortality (54). Although HIV care and treatment services for children exposed to and living with HIV are expanding in resource-limited settings, they are still inadequate. There is still a major gap in coverage of antiretroviral therapy for children versus adults. Of the 2.02 million [1 800 000–2 300 000] children estimated to need antiretroviral therapy in 2010, only 23% [20–25%] had access versus 51% of adults [48–54%] (see Chapter 5).

### 7.5.1 Infant diagnosis

Early diagnosis of HIV infection is critical to ensure optimal treatment outcomes for children. If diagnosed early and provided with appropriate treatment, infants and children living with HIV can survive to adolescence and adulthood. Although progress has been made in early diagnosis of infants, many children living with

HIV still go undiagnosed. Without diagnosis and effective treatment, one third of infants living with HIV die before the age of one year and almost half during their second year of life.

Children born to mothers living with HIV have been exposed to HIV but may not be HIV-positive. WHO's 2010 guidelines on antiretroviral therapy for HIV infection among infants and children (55) recommend that HIV-exposed infants be tested by 4–6 weeks of age using polymerase chain reaction (PCR). It is important for HIV-exposed infants to be tested early so that, if they are diagnosed as HIV-positive, they can immediately start antiretroviral therapy, regardless of clinical or immune status (56), to improve chances of survival. A second confirmatory HIV test should be done, but this should not delay starting antiretroviral therapy (56,57).

Significant progress has been made in scaling up the coverage of early infant diagnosis in 2010. In 65 low- and middle-income countries providing data (up from 54 countries in 2009), 28% [24–30%] of infants were reported to have been tested for HIV within the first

two months of birth, versus 6% [5-7%] in 2009. This increase results in part from including data in 2010 from nine priority countries for eliminating mother-to-child transmission that did not report on this indicator in 2009.

Among the 22 priority countries for eliminating mother-to-child transmission, several have exceeded 50% coverage of virological HIV testing. The coverage of virological testing of HIV-exposed children at two months of age reached 78% in Lesotho and 68% in South Africa in 2010. Kenya (64%), Namibia (62%), Swaziland (54%) and Botswana (53%) have also made considerable gains in this area. In other priority countries, greater efforts are needed to scale up early infant diagnosis to ensure that children living with HIV can initiate treatment as soon as possible. Priority actions include building technical competencies, developing laboratory capacity, strengthening systems for transporting blood specimens and results, improving cross-service referrals and expanding the routine offer of testing to more sites where mothers and children access care, especially in generalized epidemic settings.

In addition, reducing the rate of loss to follow-up among HIV-exposed infants in the postnatal period is essential. Many infants, even when tested, do not receive their results or are not given antiretroviral therapy following an HIV-positive diagnosis. Investment must be made to improve data collection and service delivery along the continuum of care so that children who test positive are enrolled in treatment in a timely manner. It is also necessary to better understand and address the challenges faced by mothers in accessing health services for their infants as well as for themselves.

### 7.5.2 Co-trimoxazole prophylaxis for HIV-exposed children

An essential component of the care and treatment package for children living with HIV is providing co-trimoxazole prophylaxis, a highly efficacious, affordable, cost-effective and widely available antibiotic that has been shown to significantly reduce morbidity and mortality among infants and children who are living with or exposed to HIV. The use of co-trimoxazole prophylaxis increases the chances of survival of infants living with HIV until antiretroviral therapy can be initiated. This is especially important in resource-limited settings, where access to interventions for preventing mother-to-child transmission and to antiretroviral therapy is still insufficient. The 2006 WHO guidelines recommend that all HIV-exposed children born to mothers living with HIV start co-trimoxazole prophylaxis between four and six weeks of age and continue until breastfeeding has terminated and HIV serostatus is known to be negative (58).

In 2010, 87 countries provided information on the number of infants born to pregnant women living with HIV who initiated co-trimoxazole prophylaxis by two months of age, up from 72 countries in 2009. Even though several countries have established policies to support access to co-trimoxazole prophylaxis for infants and children, only 23% [19-24%] of HIV-exposed infants in reporting low- and middle-income countries received co-trimoxazole in 2010; nevertheless, this was a substantial increase compared with 13% [11-14%] in 2009. The expansion in coverage was predominantly driven by progress made in countries from eastern and southern Africa, where coverage increased from 16% [15-18%] in 2009 to 31% [28-35%] in 2010. Coverage

#### Box 7.15

##### Key priorities for scaling up antiretroviral therapy for children

The Paediatric Care and Treatment Working Group of the Interagency Task Team on the Prevention and Treatment of HIV Infection in Pregnant Women, Mothers and Children recently published recommendations for accelerating the scaling up of antiretroviral therapy for children (59). Key actions include the following.

- Set high national targets for HIV testing and treatment of children.
- Expand access to early infant diagnosis of HIV.
- Increase retention in HIV programmes for children.
- Rationalize formularies for children and provide access to optimal drugs.
- Implement task-shifting of antiretroviral therapy for children.
- Address the special needs of adolescents living with HIV.

Source: Paediatric advocacy tool kit for improved paediatric HIV diagnosis, care and treatment in high prevalence countries and regions (59).

in Latin America and the Caribbean also improved from 15% [13–25%] in 2009 to 25% [21–42%] in 2010, with a larger number of countries reporting. Coverage among the 22 priority countries for eliminating mother-to-child transmission was 21% [18–25%] in 2010.

Expanding access to co-trimoxazole prophylaxis requires a set of interrelated interventions, including developing stronger links between HIV testing and treatment and establishing mechanisms to identify and follow up HIV-exposed infants at and after birth. In addition, health workers must be trained to consider HIV infection in infants at birth and at all clinic or health facility encounters, and delivery must be decentralized to the lowest appropriate, feasible and effective level of the health care system. A consistent supply of co-trimoxazole must be available, and monitoring and

evaluation systems need to be strengthened to support the provision of co-trimoxazole prophylaxis to children living with or exposed to HIV (58).

### 7.5.3 Antiretroviral therapy for children

Although the best strategy for preventing children from acquiring HIV infection and dying from AIDS-related causes is expanding effective programmes for preventing mother-to-child transmission, many HIV-related deaths among children living with HIV could be avoided by providing early HIV diagnosis and timely provision of care and treatment. To maximize the survival and well-being of children living with HIV, WHO released updated treatment guidelines in 2010 (56), which include significant changes to the criteria for children initiating antiretroviral therapy (see Box 7.15).

#### Box 7.16

##### Improvements in estimating the number of children living with HIV who need antiretroviral therapy

The Spectrum software package is used to estimate the number of children living with HIV; the same estimate is used to identify the number of children who need antiretroviral therapy. These estimates require assumptions about fertility among women living with HIV, the efficacy of various prophylaxis regimens to prevent mother-to-child transmission, the timing of progression between different CD4 levels and children's survival rates (depending, for example, on how and at what age they became infected). Based on a review of the literature and the latest available evidence, several important changes have been made to those assumptions in the past two years.

New evidence shows that the timing of infection among children is important. Survival curves now reflect, respectively, the different survival rates for children living with HIV depending on when they acquired infection – either in utero, during birth or during breastfeeding (at 0–6 months, 6–12 months or 12–14 months). The revised survival curves indicate longer life expectancy than those previously in use, thereby increasing the number of children living with HIV who need treatment (see Chapter 2).

In addition, the Spectrum program now has different survival times for adults of different ages, which has resulted in a larger proportion of women with HIV who are in the most fertile age groups compared with the estimates produced in previous years. Spectrum now also enables more detailed data on programmes for preventing mother-to-child transmission to be incorporated, including the various types of regimens mothers are using during pregnancy and during breastfeeding. The basic methods regarding the estimate of the number of women needing antiretroviral medicine have not changed. The regimen-specific probabilities of HIV transmission have been updated based on current evidence from research studies and trials on preventing mother-to-child transmission. These transmission probabilities are based on a woman's CD4 level, making estimates of the rate of mother-to-child transmission more accurate. The transmission probabilities during breastfeeding are also improved, reflecting the CD4 level of the mother. Finally, the model incorporates the very high probability of transmission if a woman becomes infected while she is pregnant or breastfeeding.

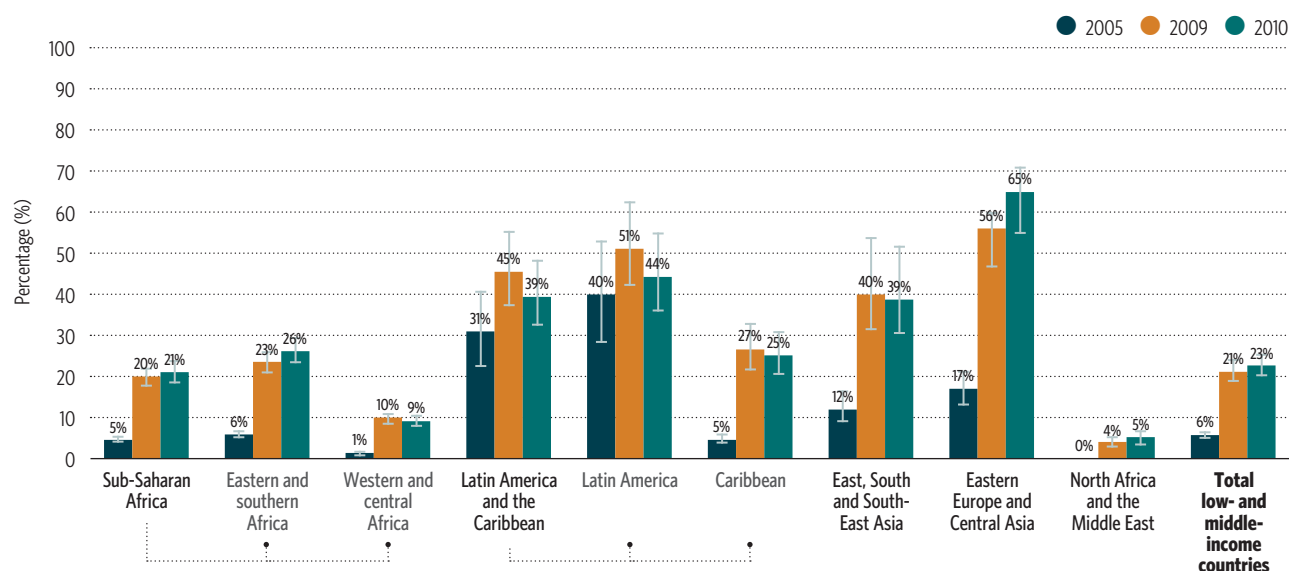
The modelling process has also incorporated the new eligibility criteria for initiating antiretroviral therapy among children, in accordance with the revised WHO treatment guidelines for infants and children (56). The change in age-specific eligibility criteria, from younger than 12 months of age to younger than 24 months of age, took effect in 2010.

The new set of estimates, based on improved data on the distribution of regimens and of infant feeding practices, combined with the above changes in methods has resulted in a larger number of children newly infected than in previous estimates despite increases in reported coverage of interventions for preventing mother-to-child transmission. Past reported estimates probably underreported the number of children newly infected. This, combined with longer survival of children who acquire HIV infection through breastfeeding, has resulted in increases in the number of children newly infected with HIV, more children living with HIV and therefore more children who need antiretroviral therapy. The estimated number of children who needed antiretroviral therapy in 2009 has been revised based on these new assumptions and has increased from 1 270 000 (as published in previous reports) to 1 670 000. For 2010, the number of children who need antiretroviral therapy is an estimated 2 020 000. The large difference between 2009 and 2010 is explained by the change in age-specific eligibility criterion. These increases in the estimates of the number of children who need antiretroviral therapy are affecting the estimated coverage of antiretroviral therapy among children. To assess trends over time, the coverage rates for 2009 and 2005 published in the 2011 report should not be compared with the coverage figures published in previous annual progress reports.

Data reported by low- and middle-income countries show that, as of December 2010, about 456 000 children younger than 15 years who need antiretroviral therapy were receiving it, a 29% rise from a year earlier (354 600 in 2009) and a six-fold increase since 2005 (75 000) (Fig 7.12 and Table 7.8). These

children represent an estimated 23% [20–25%] of the estimated 2.02 million children who need antiretroviral therapy. In 2009, coverage was estimated at 21% [19–24%]. At the end of 2010, eleven countries had reached at least 80% coverage of antiretroviral therapy for children, including two countries with generalized

**Fig. 7.12** Percentage of children living with HIV receiving antiretroviral therapy in low- and middle-income countries, 2005, 2009 and 2010



The bar indicates the uncertainty range around the estimate.  
Note: the data have been retroactively calculated according to the revised methods (see Box 7.16).

**Table 7.8** Reported number of children 0–14 years old living with HIV receiving antiretroviral therapy, children needing antiretroviral therapy and estimated coverage in low- and middle-income countries according to region, December 2010<sup>a</sup>

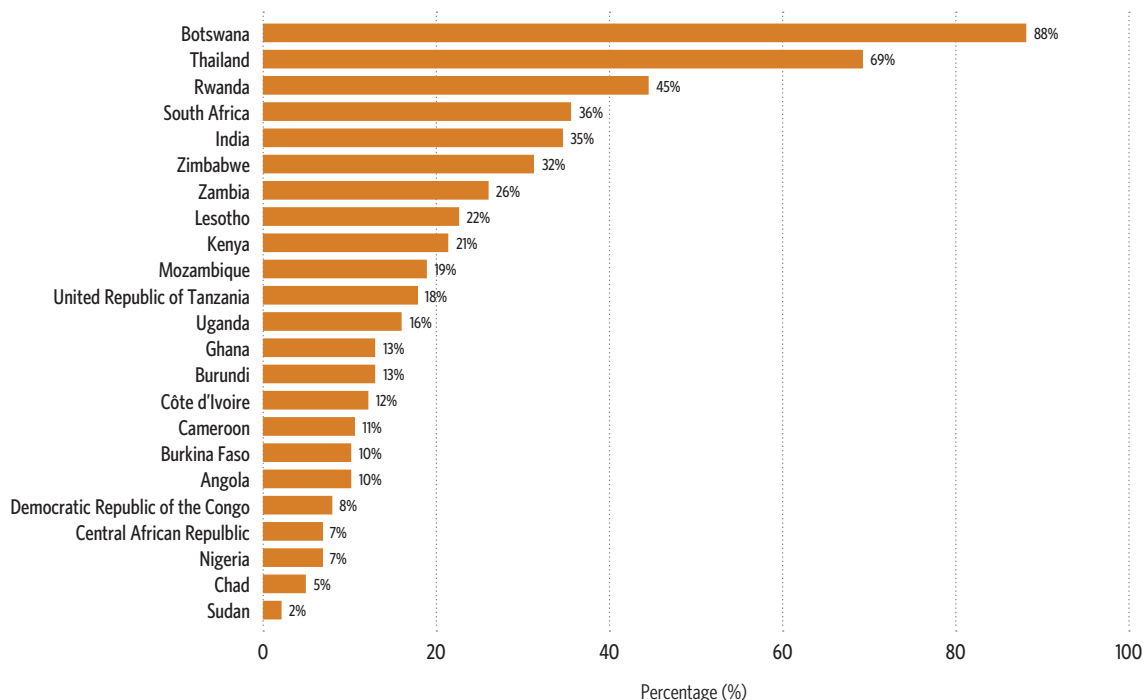
Geographical region	Reported number of children (0–14 years old) living with HIV receiving antiretroviral therapy, December 2010	Estimated number of children living with HIV needing antiretroviral therapy, 2010 [range] <sup>a</sup>	Antiretroviral therapy coverage among children living with HIV, December 2010 [range] <sup>b</sup>
Sub-Saharan Africa	387 500	1 840 000 [1 600 000–2 100 000]	21% [19–24%]
Eastern and southern Africa	337 200	1 290 000 [1 100 000–1 400 000]	26% [23–29%]
Western and central Africa	50 200	550 000 [480 000–630 000]	9% [8–11%]
Latin America and the Caribbean	16 300	41 400 [34 000–50 000]	39% [32–48%]
Latin America	13 600	30 600 [25 000–38 000]	44% [36–55%]
Caribbean	2 700	10 800 [8 700–13 000]	25% [21–31%]
East, South and South-East Asia	43 800	113 000 [84 000–140 000]	39% [30–52%]
Europe and Central Asia	7 500	11 400 [10 000–13 000]	65% [55–71%]
North Africa and the Middle East	840	18 500 [12 000–25 000]	5% [3–7%]
<b>All low- and middle-income countries</b>	<b>456 000</b>	<b>2 020 000</b> <b>[1 800 000–2 300 000]</b>	<b>23% [20–25%]</b>

Note: some numbers do not add up because of rounding.

<sup>a</sup> For an explanation of the methods used, see the explanatory notes to Annex 9.

<sup>b</sup> The coverage estimate is based on the estimated unrounded number of children receiving and needing antiretroviral therapy.

**Fig. 7.13** Percentage of children living with HIV receiving antiretroviral therapy in 25 countries with a high burden of HIV in 2010<sup>a</sup>



Note: some numbers do not add up because of rounding.

<sup>a</sup> Ethiopia and Malawi are estimated to belong to the list of 25 countries with the highest need for antiretroviral therapy among children living with HIV, but no coverage can be provided at this stage as their need estimates are currently being reviewed.

**Table 7.9** Low- and middle-income countries with more than 5000 children who need antiretroviral therapy with a difference between the antiretroviral therapy coverage among children and adults of at least 25 percentage points

Countries <sup>a</sup>	Percentage point difference between the antiretroviral therapy coverage of adults and children, 2010	Estimated antiretroviral therapy coverage among children, December 2010	Estimated antiretroviral therapy coverage among adults, December 2010
Zambia	58	26%	84%
Kenya	53	21%	74%
Guinea	52	14%	66%
Rwanda	51	45%	96%
Burkina Faso	50	10%	60%
Venezuela, Bolivarian Republic of	50	12%	62%
Chad	44	5%	49%
Benin	43	23%	66%
Togo	42	16%	58%
Lesotho	41	22%	63%
Uganda	40	16%	56%
Haiti	38	19%	57%
Mali	37	16%	53%
Zimbabwe	33	32%	65%
Cameroon	32	11%	43%
Côte d'Ivoire	30	12%	42%
Angola	29	10%	39%
United Republic of Tanzania	29	18%	47%
Niger	29	6%	35%
Congo	27	21%	48%
Ghana	27	13%	40%
Burundi	26	13%	39%
Mozambique	25	19%	44%
Cambodia	25	71%	96%

<sup>a</sup> Countries are classified by decreasing order of difference between adult and child coverage.



epidemics (Botswana and Namibia) and nine countries (Belarus, Chile, Ecuador, Guyana, Jamaica, Mexico, Paraguay, Uruguay and Uzbekistan) with concentrated or low-level epidemics.<sup>1</sup> Five countries – Nigeria (with an estimated unmet need of 262 000 for antiretroviral therapy for children), South Africa (196 000), Kenya (133 000), Uganda (102 000) and United Republic of Tanzania (91 000) – accounted for about 50% of the unmet need for antiretroviral therapy for children in 2010.

Regionally, between 2009 and 2010, the coverage of antiretroviral therapy for children increased substantially only in Europe and Central Asia, from 56% [47–60%] to 65% [55–71%]. Coverage in sub-Saharan Africa, the region with the highest burden of children in need, remained stable at 21% [19–24%] in 2010 versus 20% [17–22%] in 2009. Eastern and southern Africa had the highest number of children receiving antiretroviral therapy, at 337 000, or 26% [23–29%] of those estimated to be in need, up from 255 000, or 23% [21–26%], in 2009. The coverage of antiretroviral therapy for children in western and central Africa was considerably lower. Although the number of children receiving antiretroviral therapy increased from 41 000 in 2009 to 50 000 in 2010, coverage dropped slightly from 10% [8–11%] in 2009 to 9% [8–11%] in 2010 (Table 7.8). Coverage was also steady in East, South and South-East Asia at 39% [30–52%] in 2010, although the number of children receiving antiretroviral therapy increased from 36 400 in 2009 to 43 800 in 2010. In North Africa and the Middle East, coverage remained similar at 5% [3–7%]. Coverage fell in Latin America and the Caribbean, from 45% [38–55%] in 2009 to 39% [32–48%] in 2010.

In the group of 25 high-burden countries accounting for an estimated 91% of the children who need antiretroviral therapy (Fig. 7.13), Botswana (88%) and Thailand (69%) had the highest levels of coverage. Chad (5%) and Sudan (2%) had the lowest levels of coverage among these countries.

Although progress is being made, less than 25% of children who needed antiretroviral therapy in low- and middle-income countries received it in 2010, versus 50% coverage among adults, and this gap was even wider in some countries (Table 7.9). In 2010, 24 countries with more than 5000 children who needed

<sup>1</sup> Countries with less than 100 children needing antiretroviral therapy are excluded.

antiretroviral therapy had a difference between the antiretroviral therapy coverage levels of adults and children of at least 25 percentage points. Implementing adequate policies and interventions to ensure that the treatment needs of children are adequately met is essential.

## 7.6 Measuring the impact towards eliminating mother-to-child transmission

The Global Plan (4) seeks to reduce the number of children newly infected with HIV by 90% by 2015 (compared with 2009), reduce the number of women dying from HIV-related cause among during pregnancy, delivery and postnatally by 50% and cut the mother-to-child transmission of HIV to less than 5%. Adequately measuring progress towards these objectives is an essential part of the Plan's success.

The partners involved in the Global Plan have developed a guide summarizing five key approaches to assess the impact of preventing mother-to-child transmission:<sup>2</sup> (1) mathematical modelling; (2) prospective or retrospective cohort studies of mother-infant pairs; (3) assessing the HIV exposure and infection status of infants from the general population in immunization settings; (4) population-based surveys; and (5) assessing infection status through early infant diagnosis programmes. The approaches include methods to overcome loss to follow-up, which has been hampering efforts to evaluate preventing mother-to-child transmission for the past decade.<sup>3</sup>

South Africa has recently finalized the first part of the national impact evaluation of the national programme for preventing mother-to-child transmission. It administered a questionnaire and collected dried blood spot samples through a cross-sectional survey of children attending immunization clinics around the age of 4–8 weeks. Antibody tests were performed to

<sup>2</sup> In addition to WHO, the United States Centers for Disease Control and Prevention and UNICEF, the Clinton Health Access Initiative, the International Center for AIDS Care and Treatment Programs, the Office of the United States Global AIDS Coordinator, UNAIDS and the United States Agency for International Development have contributed to the guide thus far.

<sup>3</sup> The five approaches were presented at a special Measuring PMTCT Impact satellite session at the International AIDS Conference in Rome in July 2011, and five countries (Kenya, Mozambique, Swaziland, Rwanda and South Africa) shared their experiences in planning or implementing national evaluations of the impact of programmes for preventing the mother-to-child transmission of HIV (60).

identify children who had been exposed to HIV, and PCR tests were then performed on antibody-positive dried blood spot samples to detect HIV infection in the child. The preliminary results from the study showed that 31% of infants were born to a mother living with HIV; these percentages of HIV seropositivity among mothers were higher than data from women attending antenatal care, suggesting there may be some seroconversion of mothers during pregnancy. The estimated national rate of mother-to-child transmission among infants 4–8 weeks old was 3.5% [2.9–4.1%], with regional variation, demonstrating that low levels of peripartum transmission can be achieved. Adding the postnatal transmission from breastfeeding (late transmission) results in an estimated final mother-to-child-transmission rate of 12–18% in 2010.

This approach to measuring impact may be particularly useful in countries with a high prevalence of HIV infection and high immunization coverage rates, since it enables the assessment of outcomes of a nationally representative sample of children attending immunization visits. However, although it measures progress in interventions for preventing mother-to-child transmission delivered during pregnancy and delivery, it does not capture breastfeeding transmission, which is an important source of transmission in primarily breastfeeding populations. It also misses children living with HIV who have already died by the age of 4–8 weeks.

A follow-up study to assess final transmission is being planned in South Africa.

Although studies evaluating the impact of programmes for preventing mother-to-child transmission by directly collecting outcome data are planned or are underway in several countries, the results will not be available until 2013. As such, although the mathematical modelling of mother-to-child transmission and the number of children acquiring HIV infection has limitations, it remains the only way to systematically assess impact across many countries and regions and globally.

Based on current models that include the distribution of antiretroviral regimens, mother-to-child transmission is estimated to have declined in low- and middle-income countries from 35% in 2001 to 26% in 2010. In sub-Saharan Africa, the corresponding estimated transmission rates were similar to the global rate in all years. The estimated numbers of children acquiring HIV infection in low- and middle-income countries were 536 000 in 2000, 535 000 in 2005, 430 000 in 2009 and 390 000 in 2010. Providing antiretroviral prophylaxis to pregnant women living with HIV has enabled more than 350 000 children to avoid acquiring HIV infection since 1995 (see Box 2.9). Annex 7 reports on the number of children newly infected with HIV in the 22 priority countries in 2009 and 2010.

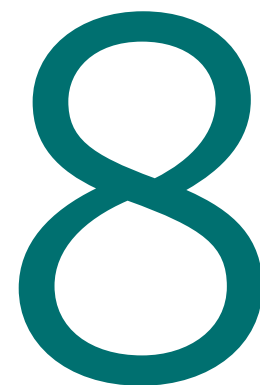
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# Conclusions: achieving and sustaining Universal Access

The achievements of the global HIV response over the last 10 years have been extraordinary. The incidence of HIV infection declined by more than 25% between 2001 and 2009 in 33 countries, and the HIV prevalence among young pregnant women attending antenatal clinics has declined by 25% or more in 7 countries (1). At the end of 2010, more than 6.6 million people were receiving antiretroviral therapy in low- and middle-income countries, a 16-fold increase from the approximately 400 000 people recorded in December 2003. Forty-eight low- and middle-income countries now provide antiretroviral therapy to more than 50% of adults in need, including 10 countries with universal access, and about 50% of pregnant women received the most effective regimens to prevent the mother-to-child transmission of HIV in 2010. As a result of these efforts, the annual number of AIDS-related deaths worldwide has fallen from the peak of 2.2 million recorded in 2005 to an estimated 1.8 million in 2010.

Although much has been accomplished since the 2001 United Nations General Assembly Special Session on HIV/AIDS, the launch of the “3 by 5” initiative in December 2003 and the adoption of the 2006 Political Declaration on HIV/AIDS, this report also draws attention to the multiple challenges that must be tackled before universal access to HIV prevention, treatment, care and support becomes a global reality. An estimated 2.7 million [2 400 000–2 900 000] people were newly infected with HIV in 2010, including 390 000 [340 000–450 000] children, bringing the total number of people living with HIV to 34 million [31 600 000–35 200 000]. The coverage, quality and accessibility of many interventions, especially among populations at higher risk for HIV infection, are still insufficient. Most people living with HIV remain

unaware of their serostatus, and late initiation of antiretroviral therapy is still common in many contexts. Retention levels across the cascade of interventions, from HIV testing to treatment and care, are inadequate, and many people identified as HIV positive are lost to follow-up.

## A time of opportunities

Nevertheless, the global HIV response has seldom been better positioned to address these challenges. The year 2011 has brought new political momentum, and important scientific breakthroughs have been announced. The recent United Nations General Assembly High Level Meeting on AIDS (2) has regvanized partners, and its final Declaration fully recognizes the central role of universal access to HIV prevention, treatment, care and support services in achieving the full range of the Millennium Development Goals. It provides a clear framework to deliver on ambitious, yet feasible, time-bound goals by 2015, including reducing sexual transmission by 50%, cutting in half the number of people living with HIV dying from TB and providing antiretroviral therapy to at least 15 million people who need it. The international community has also developed and endorsed a detailed, action-oriented global plan to support the elimination of the mother-to-child transmission of HIV and improve maternal health by 2015 (3).

New scientific evidence and innovation have also expanded the toolkit of interventions for delivering on these goals. The old divisions between treatment and prevention have been torn down. The landmark HPTN 052 study (Box 3.6) has now clearly demonstrated that antiretroviral therapy can dramatically reduce

HIV transmission. Various studies have similarly demonstrated the efficacy of pre-exposure prophylaxis in reducing the risk of acquiring HIV infection, including among men who have sex with men.

Such breakthroughs have also brought new impetus to vaccine research and development, and the scientific community is actively engaged in designing approaches that may lead to an eventual cure. Essential as this is, however, the importance of innovation goes well beyond scientific discoveries. It is also vital to improve and bring to scale existing technologies while designing new approaches that can best leverage available resources and optimize outcomes.

### **Innovation and efficiency: the unfinished agenda**

An optimized global HIV response driven by more efficient and innovative approaches lies at the core of the WHO global health sector strategy on HIV/AIDS 2011–2015 (4) and the new investment framework proposed by UNAIDS and partners. By promoting the scaling up of six core programmatic activities, according to relevant population needs, investing in critical social and programmatic enablers and seeking synergy with other development sectors, more focused investment can result in more than 12 million fewer people infected with HIV and 7.4 million fewer deaths by 2020 as compared to the baseline. Realizing greater efficiency and impact by developing and scaling up new modalities of service delivery is also central to the five pillars of the Treatment 2.0 initiative.

Although investing available resources more effectively is essential, fully implementing this optimized approach requires a further US\$ 7 to 9 billion annually, in addition to the US\$ 15 billion currently available, to expand the coverage of key interventions. The resources available globally to fund the HIV response declined in 2010 despite growing evidence of effectiveness and impact. HIV programmes must be fully funded not only to sustain current achievements but also to ensure that interventions reach the scale and intensity needed to maximize their population-level benefit.

After almost a decade of extraordinary efforts and results, it has become increasingly clear that achieving universal access to HIV prevention, treatment, care

and support requires changing both the demand for and supply of services. More must be done to stimulate users to seek out services and ensure they can access them, and systems must be adapted and strengthened to provide timely, affordable and high-quality interventions.

### **Reach and retain**

In many contexts, current accomplishments reflect coverage of the most accessible segments of the population, mostly more highly educated city residents with comparatively greater monetary resources in closer proximity to health systems (5–7). Greater efforts and novel strategies are needed to extend service provision to harder-to-reach populations, including poorer rural communities and key populations at higher risk of HIV infection and transmission, such as men who have sex with men, transgender people, sex workers, people who inject drugs, migrants and prisoners.

More data have become available on the burden of the epidemic among these populations, including in countries with generalized epidemics in sub-Saharan Africa (see Chapter 1). However, the responses have lagged considerably behind. For instance, in Eastern Europe and Central Asia, people who inject drugs, one of the most severely affected key populations, continue to be less likely to have access to antiretroviral therapy than people who acquired HIV through other routes of transmission (see section 6.4). Moreover, key populations at higher risk of HIV infection continue to face high levels of stigma, criminalization and harassment, thus impairing their ability and willingness to seek life-saving prevention, treatment, care and support. Gender-based violence also remains a major source of inequity in health services. Addressing these situations requires considerably stronger human rights frameworks so that these populations can be adequately protected and can freely access, without fear of persecution or reprisal, services tailored to their needs.

Greater attention is also needed to ensure that people who are aware of their serostatus are adequately followed up so that they can enrol in care or receive antiretroviral therapy. For instance, many pregnant women, even when found to be living with HIV and provided with antiretroviral drugs to prevent the vertical transmission of HIV, are not retained in care for their



own health. Lack of follow-up also negatively affects their babies, who fail to receive early diagnosis and, if found to be living with HIV, provided with the necessary treatment. Retention therefore needs to be improved throughout the cascade of interventions by developing more robust linkage systems and by identifying and addressing key barriers. Several countries have made progress in developing systems to measuring and reducing patient attrition (Box 5.6).

### **Adapting services to meet clients' needs**

The experiences of countries that have successfully achieved universal access for some programme components, such as Rwanda, clearly demonstrate the importance of bringing services closer to communities (Box 5.10). Transport and opportunity costs can powerfully deter seeking out health care and associated commodities, which is especially important given the lifelong nature of antiretroviral therapy. Decentralizing high-quality services to the lowest feasible level of the health system can facilitate early diagnosis and retention in care and may ensure that non-urban and often poorer segments of the population can reach services (8).

System structures and pathways must be streamlined and coordinated so that navigating them becomes less burdensome and time-consuming to users. Multiple appointments, scheduled for different days and at different services, discourage people from attending and being followed up. Moreover, a client-centred approach requires recognizing that individuals often reach health systems with multiple needs that extend beyond those related to HIV. For instance, a woman may need family planning for herself and vaccination for her children in addition to antiretroviral drugs. Nevertheless, patient needs are still too often perceived and addressed in isolation, and many missed opportunities result in profound detrimental effects on general health outcomes.

Closer collaboration and integration must be developed among services, including those for maternal and child health, harm reduction, sexual and reproductive health and managing TB, other sexually transmitted infections and viral hepatitis. Organizational arrangements must consider the local context, including epidemiological profiles. They may cover a broad spectrum, from

strengthening referral systems to establishing one-stop clinics that can offer multiple interventions by the same clinical team. Greater coordination between HIV and noncommunicable disease programmes is also vital to expand the coverage of interventions that can address a host of other critical conditions, including those associated with ageing, poor nutrition and sanitation and mental disorders.

### **Preparing systems for reaching and sustaining universal access**

As HIV programmes continue to be scaled up, health systems must be prepared to provide care to more people, at an earlier stage of HIV infection and for a longer period of time. In settings facing severe shortages of health care workers, enhanced task-shifting strategies need to be designed and implemented to tackle enrolment bottlenecks and ensure the sustainability of programmes. Health workers need to be adequately prepared and supported to address the needs of increasing numbers of people who require lifelong care. In Malawi, local programmes have pioneered innovative approaches (see Box 5.6) with remarkable results. Procurement and supply management systems must also be improved and expanded, as stock-outs of antiretroviral drugs are still common in more than one third of reporting low- and middle-income countries (see section 5.3.6). This is especially important as new medicines and interventions become available, such as point-of-care diagnostics, and are incorporated into health care supply chains.

Governance systems must be further strengthened to ensure inclusive, transparent and accountable leadership. In this respect, communities of people living with or affected by HIV must be fully engaged in designing, implementing and evaluating national HIV responses. Their continued activism is fundamental in catalysing and sustaining political momentum.

Although emergency approaches were instrumental in building or strengthening HIV programmes for rapid scale-up in most countries, their transition to sustainable models of service delivery must be accelerated. This entails addressing three key issues. First, the capacity of governments, communities and civil society organizations to take leadership of national responses must be reinforced. In addition,

HIV responses need to be clearly linked with other national social and economic goals and frameworks so that programmes address the epidemic within their broader health and development contexts. Lastly, as life expectancy increases and HIV management evolves towards a model of chronic-disease care, greater attention needs to be focused on monitoring the quality of the services provided, as this strongly influences long-term adherence, retention in care and outcomes.

The challenges towards universal access are considerable, but so are the technical resources, political support and commitment of all partners involved in the global HIV response. Additional focused investment and building on current achievements and applying the lessons learned from implementing programmes can enable the efficiency, quality and coverage of interventions to be increased and ultimately make universal access to large-scale, high-quality HIV prevention, treatment, care and support a reality.

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**Annex 1** Reported proportion of women attending antenatal care tested for syphilis at the first visit, women attending antenatal care seropositive for syphilis, sex workers seropositive for active syphilis, men who have sex with men seropositive for active syphilis, as reported by low- and middle-income countries in 2010<sup>a</sup>

Country	% of women attending antenatal care tested for syphilis at the first visit	Year	% of women attending antenatal care seropositive for syphilis	Year	% of sex workers seropositive for active syphilis	Year	% of men who have sex with men seropositive for active syphilis	Year
Number of countries reporting	63		75		40		31	
Afghanistan	...	...	...	...	8.7%	2010	17.0%	2010
Argentina	84.4%	2010	1.3%	2010	22.4%	2008	20.5%	2008
Bangladesh	...	...	0.6%	2008	4.2%	2007	1.0%	2007
Belize	90.4%	2010	1.4%	2010	...	...	...	...
Bhutan	...	...	1.0%	2006	...	...	...	...
Botswana	...	...	1.3%	2009	...	...	...	...
Brazil	75.1%	2006	...	...	2.5%	2009	13.4%	2009
Burkina Faso	0.9%	2009	1.4%	2009	...	...	...	...
Cambodia	...	...	0.4%	2010	2.3%	2005	0.9%	2005
Cameroon	...	...	0.6%	2009	...	...	...	...
Central African Republic	71.9%	2010	10.0%	2010	...	...	...	...
Chile	100%	2010	0.2%	2010	6.3%	2010	...	...
China	...	...	0.4%	2010	2.9%	2010	8.4%	2010
Colombia	85.4%	2005	0.6%	2010	...	...	3.3%	2010
Comoros	0.0%	2010	0.0%	NR	0.5%	2010	...	...
Costa Rica	85.0%	2009	1.4%	2009	12.9%	2009	13.7%	2009
Côte d'Ivoire	...	...	0.2%	2008	...	...	...	...
Cuba	100%	2010	0.0%	2010	...	...	...	...
Democratic Republic of the Congo	2.1%	2009	3.3%	2009	...	...	...	...
Djibouti	63.3%	2009	0.2%	2009	...	...	...	...
Dominican Republic	...	...	0.5%	2010	5.1%	2010	7.0%	2010
Ecuador	67.8%	2009	0.1%	NR	...	...	6.5%	NR
El Salvador	63.6%	2009	0.5%	2009	2.7%	2008	6.2%	2008
Equatorial Guinea	35.8%	NR	14.0%	NR	...	...	...	...
Eritrea	0.0%	2010	...	...	...	...	...	...
Ethiopia	...	...	2.2%	2007	...	...	...	...
Fiji	100%	NR	2.8%	NR	...	...	26.5%	NR
Gabon	95.0%	2010	1.0%	2010	2.1%	2010	...	...
Ghana	9.0%	2010	3.4%	2010	...	...	...	...
Grenada	100%	NR	3.7%	NR	...	...	...	...
Guatemala	13.5%	2010	4.2%	2010	4.8%	2010	16.7%	2010
Guinea-Bissau	...	...	1.1%	2009	19.6%	2010	2.0%	2010
Guyana	100%	2010	0.2%	NR	...	...	...	...
Haiti	68.4%	2010	4.7%	2010	...	...	...	...
Honduras	41.5%	2010	1.5%	NR	1.5%	NR	12.9%	NR
Hungary	...	...	...	...	...	...	4.4%	NR
India	65.4%	2010	0.3%	2010	...	...	...	...
Indonesia	...	...	...	...	6.1%	2009	8.0%	2009
Iran (Islamic Republic of)	0.0%	NR	...	...	...	...	...	...
Iraq	27.3%	2010	0.0%	2010	...	...	...	...

Country	% of women attending antenatal care tested for syphilis at the first visit		% of women attending antenatal care seropositive for syphilis		% of sex workers seropositive for active syphilis		% of men who have sex with men seropositive for active syphilis	
		Year		Year		Year		Year
Jamaica	73.1%	2010	1.6%	2010	1.2%	2008	15.0%	2007
Jordan	0.0%	NR	...	...	...	...	...	...
Kenya	58.8%	2010	1.8%	2010	0.8%	2010	0.9%	2010
Kiribati	100%	2010	...	...	...	...	...	...
Lao People's Democratic Republic	...	...	...	...	0.6%	2008	...	...
Lesotho	66.9%	2010	1.6%	2010	...	...	...	...
Liberia	10.9%	2010	13.6%	2010	...	...	...	...
Madagascar	84.7%	2010	6.0%	2010	12.2%	2007	...	...
Malawi	...	...	1.1%	2007	...	...	...	...
Malaysia	98.7%	2010	0.1%	2010	...	...	...	...
Maldives	41.7%	2010	0.0%	2010	...	...	...	...
Mali	...	...	2.4%	2009	0.0%	2009	...	...
Mauritius	100%	2010	0.1%	2010	4.4%	2010	5.8%	2010
Mongolia	82.9%	2010	2.2%	2010	18.3%	2009	5.4%	2009
Morocco	...	...	0.6%	2010	9.4%	2010	16.8%	2010
Mozambique	66.7%	2010	5.7%	NR	...	...	...	...
Myanmar	8.1%	NR	0.7%	2010	...	...	...	...
Namibia	93.8%	2010	1.7%	2010	...	...	...	...
Nepal	...	...	...	...	1.0%	2008	1.5%	2009
Nicaragua	60.0%	2010	0.5%	2010	5.3%	2010	6.4%	2010
Niger	...	...	...	...	2.3%	2010	...	...
Nigeria	...	...	1.5%	2005	...	...	...	...
Oman	99.4%	2010	...	...	...	...	...	...
Papua New Guinea	...	...	7.0%	2010	21.1%	2010	...	...
Paraguay	52.7%	2010	4.5%	2010	14.6%	NR	18.8%	NR
Peru	72.1%	2010	0.3%	2010	...	...	...	...
Philippines	...	...	0.2%	2010	1.3%	2009	2.1%	2009
Republic of Moldova	...	...	0.4%	2010	8.9%	2010	12.1%	2010
Rwanda	75.2%	2010	1.5%	2010	...	...	...	...
Samoa	100%	NR	2.3%	NR	...	...	...	...
Sao Tome and Principe	89.2%	2010	0.4%	2010	...	...	...	...
Seychelles	100%	NR	0.0%	NR	...	...	...	...
Sierra Leone	0.0%	2010	1.4%	2010	...	...	...	...
Slovakia	...	...	0.1%	2010	...	...	...	...
Solomon Islands	72.8%	2010	6.7%	2010	...	...	...	...
Somalia	8.5%	2010	1.3%	2010	3.4%	2008	...	...
South Africa	74.5%	2010	2.2%	2010	...	...	...	...
Sri Lanka	98.0%	NR	0.0%	NR	3.0%	2009	4.7%	2009
Sudan	3.3%	2010	2.2%	2009-2010	...	...	...	...
Swaziland	34.8%	2009	8.3%	2010	...	...	...	...

Country	% of women attending antenatal care tested for syphilis at the first visit	Year	% of women attending antenatal care seropositive for syphilis	Year	% of sex workers seropositive for active syphilis	Year	% of men who have sex with men seropositive for active syphilis	Year
Tajikistan	...	...	...	...	11.5%	2010	...	...
Thailand	...	...	0.1%	2010	0.6%	2010	...	...
Timor-Leste	0.0%	NR	...	...	8.8%	2010	5.3%	2010
Togo	4.6%	2010	1.2%	2010	...	...	...	...
Turkey	...	...	...	...	2.9%	2010	...	...
Ukraine	...	...	...	...	4.4%	2009	1.9%	2009
United Republic of Tanzania	78.1%	2007-2008	2.8%	2007-2008	2.5%	2010	...	...
Uruguay	94.6%	2009	1.3%	2009	...	...	...	...
Venezuela (Bolivarian Republic of)	96.1%	NR	1.9%	NR	...	...	...	...
Viet Nam	...	...	...	...	1.6%	2009	1.1%	2009
Zambia	43.3%	2010	5.3%	2010	...	...	...	...
Zimbabwe	56.1%	2010	4.3%	2010	...	...	...	...

... Data not available or not applicable.

NR Data not reported.

a The data should be interpreted with caution, since the data may not be nationally representative and the methods varied among countries.

**Annex 2** Reported number of facilities with HIV testing and counselling and number of people older than 15 years who received HIV testing and counselling, low- and middle-income countries, 2009-2010

	Testing and counselling facilities, 2009		Testing and counselling facilities, 2010		Number of people aged 15 years and older who received HIV testing and counselling, 2009 <sup>b</sup>			Number of people aged 15 years and older who received HIV testing and counselling, 2010 <sup>b</sup>		
	Reported number	Estimated number per 100 000 adult population	Reported number	Estimated number per 100 000 adult population	Reported number <sup>c</sup>	Estimated number per 100 000 adult population	Reporting period	Reported number <sup>c</sup>	Estimated number per 100 000 adult population	Reporting period
<b>Low- and middle-income countries<sup>a</sup></b>										
Afghanistan	25	0.2	11	0.1	8 001	0.6	Jan. 09-Dec. 09	22 844	1.6	Jan. 10-Dec. 10
Albania	...	...	18	1.1	...	...		2 896	1.7	Oct. 09-Sept. 10
Algeria	...	...	59	0.3	...	...		53 736	2.6	Jan. 10-Dec. 10
Angola	285	3.3	270	3.1	...	...		442 200	51.6	Jan. 10-Dec. 10
Argentina	7 856	38.7	7 856	38.4	...	...		...	...	
Armenia	150	9.2	150	9.3	70 955	43.7	Jan. 09-Dec. 09	71 316	44.4	Jan. 10-Dec. 10
Azerbaijan	...	...	...	...	...	...		361 574	66.6	Jan. 10-Dec. 10
Bangladesh	105	0.1	105	0.1	26 369	0.3	Jan. 09-Dec. 09	33 190	0.4	Jan. 10-Dec. 10
Belarus	1 070	20.9	1 070	21.4	...	...		816 234	163.3	Jan. 10-Dec. 10
Belize	43	26.3	66	39.6	23 802	145.5	Jan. 09-Dec. 09	27 305	163.9	Jan. 10-Dec. 10
Benin	126	3	416	10	280 982	67	Jan. 09-Dec. 09	318 389	76.9	Oct. 09-Sept. 10
Bhutan	34	8.8	...	...	...	...		8 915	21.7	Jan. 10-Dec. 10
Bolivia (Plurinational State of)	250	5.1	305	6.1	210 021	42.5	Jan. 09-Dec. 09	260 641	52.2	Jan. 10-Dec. 10
Bosnia and Herzegovina	40	2.1	41	2.1	20 369	10.5	Jan. 09-Dec. 09	19 897	10.3	Jan. 10-Dec. 10
Botswana	666	62.7	865	79.2	330 159 <sup>d</sup>	311	Jan. 09-Dec. 09	353 430	323.6	Jan. 10-Dec. 10
Brazil	3 579	3.4	3 579	3.4	...	...		16 768 609	157.3	Jan. 10-Dec. 10
Bulgaria	...	...	...	...	...	...		...	...	
Burkina Faso	1 267	17.4	1 531	19.9	602 961	82.6	Jan. 09-Dec. 09	565 311	73.4	Jan. 10-Dec. 10
Burundi	319	7.4	399	9.2	281 959	65.6	Jan. 09-Dec. 09	373 895	85.8	Jan. 10-Dec. 10
Cambodia	233	2.9	246	3.2	622 127	77.2	Jan. 09-Dec. 09	762 774	98.5	Jan. 10-Dec. 10
Cameroon	2 025	21.4	2 067	21.6	450 022	47.6	Jan. 09-Dec. 09	648 019	67.7	Jan. 10-Dec. 10
Cape Verde	205	76.5	...	...	25 075	93.5	Jan. 09-Dec. 09	...	...	
Central African Republic	105	4.9	112	5.3	136 202	64.2	Jan. 09-Dec. 09	118 045	55.6	Jan. 10-Dec. 10
Chad	72	1.4	77	1.5	66 191	13.1	Jan. 09-Dec. 09	57 878	11.4	Jan. 10-Dec. 10
Chile	844	9.3	1 897	20.7	560 147	61.5	Jan. 09-Dec. 09	427 011	46.6	Jan. 10-Dec. 10
China	7 335	1	9 475	1.3	...	...		...	...	
Colombia	...	...	...	...	...	...		772 116	31	Jan. 10-Dec. 10
Comoros	14	4	15	4.3	3 281	9.4	Jan. 09-Dec. 09	4 428	12.6	Jan. 10-Dec. 10
Congo	103	5.7	118	6	82 332	45.8	Jan. 09-Dec. 09	89 546	45.5	Jan. 10-Dec. 10
Cook Islands	...	...	...	...	...	...		...	...	
Costa Rica	1 106	43.3	1 166	44.7	...	...		...	...	
Côte d'Ivoire	550	5.5	636	6.8	727 290	72.5	Jan. 09-Dec. 09	791 424	84.6	Jan. 10-Dec. 10
Croatia	10	0.5	10	0.5	1 643	0.8	Jan. 09-Dec. 09	2 866	1.4	Jan. 10-Dec. 10
Cuba	378	6.2	378	6.2	1 888 065	310.7	Jan. 09-Dec. 09	...	...	
Democratic People's Republic of Korea	...	...	...	...	...	...		...	...	
Democratic Republic of the Congo	538	1.8	655	2.2	392 491	17.7	Jan. 09-Oct. 09	599 895	20.2	Jan. 10-Dec. 10
Djibouti	28	6.1	...	...	14 154	31.1	Jan. 09-Dec. 09	9 936	21.2	Jan. 10-Dec. 10
Dominica	60	172.1	52	146.7	4 402	126.3	Jan. 09-Dec. 09	...	...	
Dominican Republic	150	2.8	150	2.9	259 110	49.1	Jan. 09-Dec. 09	209 125	40.5	Jan. 10-Dec. 10
Ecuador	1 263	18	2 406	31.5	403 263	57.3	Jan. 09-Dec. 09	415 770	54.5	Jan. 10-Dec. 10
Egypt	...	...	127	0.3	...	...		14 185	0.3	Jan. 10-Dec. 10
El Salvador	489	15.7	658	20.5	362 628	116.6	Jan. 09-Dec. 09	...	...	

Low- and middle-income countries <sup>a</sup>	Testing and counselling facilities, 2009		Testing and counselling facilities, 2010		Number of people aged 15 years and older who received HIV testing and counselling, 2009 <sup>b</sup>			Number of people aged 15 years and older who received HIV testing and counselling, 2010 <sup>b</sup>		
	Reported number	Estimated number per 100 000 adult population	Reported number	Estimated number per 100 000 adult population	Reported number <sup>c</sup>	Estimated number per 100 000 adult population	Reporting period	Reported number <sup>c</sup>	Estimated number per 100 000 adult population	Reporting period
Equatorial Guinea	80	24.6	...	...	24 256	74.6	Jan. 09-Dec. 09	24 075	70.2	Jan. 10-Dec. 10
Eritrea	...	...	173	6.6	132 829	52.2	Jan. 09-Dec. 09	127 202	48.2	Jan. 10-Dec. 10
Ethiopia	1 823	4.7	2 243	5.6	6 630 647	172.3	Jan. 09-Dec. 09	9 407 180	235.6	Jan. 10-Dec. 10
Fiji	31	7	26	5.6	27 865	63.3	Jan. 09-Dec. 09	17 182	37.1	Jan. 10-Dec. 10
Gabon	119	15.8	119	15.3	33 550	44.5	Jan. 09-Dec. 09	48 348	62.2	Jan. 10-Dec. 10
Gambia	34	4.2	35	4.2	47 549	66	Jan. 09-Oct. 09	58 326	70.1	Jan. 10-Dec. 10
Georgia	...	...	334	15	...	...		70 615	31.8	Jan. 10-Dec. 10
Ghana	808	6.7	1 059	8.7	1 253 312	104.4	Jan. 09-Dec. 09	1 063 085	87.3	Jan. 10-Dec. 10
Grenada	38	65.9	48	83.1	...	...		3 293	57	Jan. 10-Dec. 10
Guatemala	230	3.5	258	3.8	243 644	37.3	Jan. 09-Dec. 09	216 139	32	Jan. 10-Dec. 10
Guinea	83	1.8	83	1.8	74 090	15.8	Jan. 09-Dec. 09	166 576	35.8	Jan. 10-Dec. 10
Guinea-Bissau	62	8.4	62	8.6	24 871	33.8	Jan. 09-Dec. 09	73 476	102.2	Jan. 10-Dec. 10
Guyana	168	42.7	206	52.2	99 837 <sup>e</sup>	253.8	Jan. 09-Dec. 09	106 484	270	Jan. 10-Dec. 10
Haiti	167	3.3	170	3.3	681 002	132.8	Jan. 09-Dec. 09	504 827	98.8	Jan. 10-Dec. 10
Honduras	700	18.5	743	19.1	199 006	52.5	Jan. 09-Dec. 09	265 541	68.2	Jan. 10-Dec. 10
Hungary	144	3	144	3	99 538	20.6	Jan. 09-Dec. 09	...	...	
India	5 089	0.8	7 657	1.2	13 494 372	21.2	Jan. 09-Dec. 09	14 125 701	21.6	Jan. 10-Dec. 10
Indonesia	565	0.4	388	0.3	170 791 <sup>f</sup>	1.3	Jan. 09-Dec. 09	189 729	1.4	Jan. 10-Dec. 10
Iran (Islamic Republic of)	...	...	476	1	...	...		52 802	1.2	Oct. 09-Sept. 10
Iraq	...	...	33	0.2	...	...		3 780	0.3	Jan. 10-Dec. 10
Jamaica	343	24.3	338	23.9	...	...		...	...	
Jordan	12	0.3	12	0.4	271	0.1	Jan. 09-Dec. 09	134	0	Jan. 10-Dec. 10
Kazakhstan	3 801	43.9	5 330	60.6	1 498 858	173.1	Jan. 09-Dec. 09	1 938 180	220.3	Jan. 10-Dec. 10
Kenya	4 115	21.3	4 438	22.5	4 433 557	230	Jan. 09-Dec. 09	5 738 282	290.8	Jan. 10-Dec. 10
Kiribati	9	17	12	23.2	5 957	112.7	Jan. 09-Dec. 09	1 714	33.1	Jan. 10-Dec. 10
Kyrgyzstan	25	0.8	...	...	172 106	56.9	Jan. 09-Dec. 09	...	...	
Lao People's Democratic Republic	110	3.4	146	4.4	40 962	12.7	Jan. 09-Dec. 09	33 683	10.2	Jan. 10-Dec. 10
Latvia	4 743	416.2	...	...	...	...		...	...	
Lebanon	19	0.8	21	0.9	...	...		...	...	
Lesotho	239	23.8	216	19.4	251 242	250.6	Jan. 09-Dec. 09	235 295	211	Jan. 10-Dec. 10
Liberia	114	6.1	176	9.3	80 295	43	Jan. 09-Dec. 09	170 341	90.3	Jan. 10-Dec. 10
Libya	...	...	...	...	...	...		...	...	
Lithuania	758	45.2	...	...	...	...		...	...	
Madagascar	816	8.8	1 642	16.9	324 809	35	Jan. 09-Dec. 09	192 813	19.9	Jan. 10-Dec. 10
Malawi	728	10.7	772	11.6	1 449 645	213.7	Jan. 09-Dec. 09	1 726 762	258.4	Jan. 10-Dec. 10
Malaysia	7 627	51.3	7 552	50.4	662 062	44.6	Jan. 09-Dec. 09	903 011	60.2	Jan. 10-Dec. 10
Maldives	8	4.3	8	4.2	4 285	22.9	Jan. 09-Dec. 09	6 185	32.6	Jan. 10-Dec. 10
Mali	1 091	17.6	1 182	17	255 835	41.3	Jan. 09-Dec. 09	239 115	34.3	Jan. 10-Dec. 10
Marshall Islands	2	6	...	...	...	...		...	...	
Mauritania	...	...	...	...	9 498	5.7	Jan. 09-Dec. 09	7 738	4.4	Jan. 10-Dec. 10
Mauritius	193	27.1	222	30.6	33 744	47.4	Jan. 09-Dec. 09	44 769	61.6	Jan. 10-Dec. 10
Mexico	2 784	4.7	14 260	23.5	...	...		...	...	
Micronesia (Federated States of)	...	...	...	...	...	...		...	...	
Mongolia	57	3.5	61	3.7	9 015	5.5	Jan. 09-Dec. 09	77 768	47.4	Jan. 10-Dec. 10
Montenegro	8	2.6	8	2.6	738	2.4	Jan. 09-Dec. 09	780	2.5	Jan. 10-Dec. 10



	Testing and counselling facilities, 2009		Testing and counselling facilities, 2010		Number of people aged 15 years and older who received HIV testing and counselling, 2009 <sup>b</sup>			Number of people aged 15 years and older who received HIV testing and counselling, 2010 <sup>b</sup>		
	Reported number	Estimated number per 100 000 adult population	Reported number	Estimated number per 100 000 adult population	Reported number <sup>c</sup>	Estimated number per 100 000 adult population	Reporting period	Reported number <sup>e</sup>	Estimated number per 100 000 adult population	Reporting period
<b>Low- and middle-income countries<sup>a</sup></b>										
Morocco	...	...	103	0.6	...	...		49 060	2.8	Jan. 10–Dec. 10
Mozambique	356	3.4	1 274	11.9	1 201 942	114.4	Jan. 09–Dec. 09	1 139 166	106.3	Jan. 10–Dec. 10
Myanmar	350	1.2	470	1.7	270 301	9.6	Jan. 09–Dec. 09	365 677	13.4	Jan. 10–Dec. 10
Namibia	264	23.4	381	32.1	249 011	221	Jan. 09–Dec. 09	136 305	114.8	Jan. 10–Dec. 10
Nauru	...	...	...	...	...	...		...	...	
Nepal	179	1.2	227	1.5	125 400	8.3	Jan. 09–Dec. 09	198 045	12.9	Jan. 10–Dec. 10
Nicaragua	862	28.6	1 079	35.3	205 233	68.1	Jan. 09–Dec. 09	175 000	57.3	Jan. 10–Dec. 10
Niger	321	5	546	8.3	358 071	55.6	Jan. 09–Dec. 09	425 696	64.8	Jan. 10–Dec. 10
Nigeria	1 074	1.5	1 046	1.4	2 570 386	35.1	Jan. 09–Dec. 09	2 287 805	30.9	Jan. 10–Dec. 10
Niue	...	...	...	...	...	...		...	...	
Oman	61	3.7	227	12.8	605 755	368	Jan. 09–Dec. 09	757 709	428	Jan. 10–Dec. 10
Pakistan	13	0	14	0	11 439	0.1	Jan. 09–Dec. 09	...	...	
Palau	...	...	...	...	...	...		...	...	
Panama	123	6.7	...	...	60 798	33.3	Jan. 09–Dec. 09	...	...	
Papua New Guinea	177	5.2	266	7.7	159 005	46.9	Jan. 09–Dec. 09	136 643	39.5	Jan. 10–Dec. 10
Paraguay	143	4.4	285	8.6	159 607	49	Jan. 09–Dec. 09	82 477	24.8	Jan. 10–Dec. 10
Peru	5 096	32.6	7 902	50.8	...	...		989 547	63.7	Jan. 10–Dec. 10
Philippines	82	0.2	91	0.2	10 110	0.2	Jan. 09–Dec. 09	13 287	0.3	Jan. 10–Dec. 10
Poland	2 645	13.7	...	...	25 452	1.3	Jan. 09–Dec. 09	...	...	
Republic of Moldova	56	2.9	67	3.5	86 558	45.1	Jan. 09–Dec. 09	101 541	53.8	Jan. 10–Dec. 10
Romania	120	1.1	120	1.1	280 510	25.8	Jan. 09–Dec. 09	291 915	26.7	Jan. 10–Dec. 10
Russian Federation	...	...	...	...	...	...		...	...	
Rwanda	395	8	434	8.5	1 932 420	393.8	Jan. 09–Dec. 09	2 407 073	469.2	Jan. 10–Dec. 10
Saint Kitts and Nevis	...	...	...	...	...	...		...	...	
Saint Lucia	39	40.3	...	...	1 629	16.8	Jan. 09–Dec. 09	...	...	
Saint Vincent and the Grenadines	40	66.6	...	...	6 416	106.9	Jan. 09–Dec. 09	...	...	
Samoa	...	...	9	10.3	...	...		589	6.7	Jan. 10–Dec. 10
Sao Tome and Principe	41	51.1	38	46.4	13 212	164.8	Jan. 09–Dec. 09	14 689	179.3	Jan. 10–Dec. 10
Senegal	532	8.8	...	...	352 197	58.3	Jan. 09–Dec. 09	...	...	
Serbia	52	1.1	56	1.2	53 399	11	Jan. 09–Dec. 09	51 727	10.7	Jan. 10–Dec. 10
Seychelles	27	58.3	26	53.7	10 808	233.4	Jan. 09–Dec. 09	10 867	224.6	Jan. 10–Dec. 10
Sierra Leone	416	15.2	511	18.1	281 218	102.7	Jan. 09–Dec. 09	232 452	82.4	Jan. 10–Dec. 10
Slovakia	...	...	3 902	134.2	...	...		128 563	44.2	Jan. 10–Dec. 10
Solomon Islands	...	...	25	9.3	...	...		1 020 <sup>g</sup>	3.8	Jan. 10–Dec. 10
Somalia	19	0.5	42	1	10 057 <sup>h</sup>	2.4	Jan. 09–Dec. 09	16 588	3.9	Jan. 10–Dec. 10
South Africa	4 326	15.8	4 552	16.7	6 989 312	256.1	Jan. 09–Dec. 09	6 553 952	240.1	Jan. 10–Dec. 10
Sri Lanka	47	0.4	96	0.9	...	...		16 767	1.5	Jan. 10–Dec. 10
Sudan	210 <sup>i</sup>	1	281 <sup>i</sup>	1.3	103 373 <sup>i</sup>	4.9	Jan. 09–Dec. 09	108 803	5.1	Jan. 10–Dec. 10
Suriname	59	21.2	67	23.9	19 276	69.3	Jan. 09–Dec. 09	...	...	
Swaziland	170	28.5	198	32.6	149 755	251.3	Jan. 09–Dec. 09	148 072	243.7	Jan. 10–Dec. 10
Syrian Arab Republic	...	...	23	0.2	...	...		3 022	0.3	Jan. 10–Dec. 10
Tajikistan	231	6.3	235	6.5	285 831	78.5	Jan. 09–Dec. 09	278 738	77.6	Jan. 10–Dec. 10
Thailand	1 014	2.7	1 316	3.5	1 099 657	29.3	Jan. 09–Dec. 09	1 164 656	31.1	Jan. 10–Dec. 10

	Testing and counselling facilities, 2009		Testing and counselling facilities, 2010		Number of people aged 15 years and older who received HIV testing and counselling, 2009 <sup>b</sup>			Number of people aged 15 years and older who received HIV testing and counselling, 2010 <sup>b</sup>		
	Reported number	Estimated number per 100 000 adult population	Reported number	Estimated number per 100 000 adult population	Reported number <sup>c</sup>	Estimated number per 100 000 adult population	Reporting period	Reported number <sup>c</sup>	Estimated number per 100 000 adult population	Reporting period
<b>Low- and middle-income countries<sup>a</sup></b>										
The former Yugoslav Republic of Macedonia	14	1.3	24	2.2	...	...		...	...	
Timor-Leste	...	...	17	3.5	...	...		1 241	2.5	Jan. 10-Dec. 10
Togo	225	6.9	377	12.5	166 887	51.1	Jan. 09-Dec. 09	200 190	66.5	Jan. 10-Dec. 10
Tonga	...	...	10	20	...	...		6 402	128.1	Jan. 10-Dec. 10
Tunisia	2 430	40.9	261	4.4	13 915	2.3	Jan. 09-Dec. 09	12 000	2	Jan. 10-Dec. 10
Turkey	1362	3.3	1362	3.4	...	...		...	...	Jan. 10-Dec. 10
Turkmenistan	...	...	...	...	...	...		...	...	
Tuvalu	...	...	...	...	...	...		...	...	
Uganda	1 215	8.5	1904	13	2 363 468 <sup>j</sup>	165.1	Oct. 08-Sept. 09	2 654 683	181	Jan. 10-Dec. 10
Ukraine	2 002	8.5	1880	8.1	...	...		3 247 002	140.5	Jan. 10-Dec. 10
United Republic of Tanzania	2 134	10.6	2 193	10.7	1 970 324	98.3	Jan. 09-Dec. 09	2 115 827	103.1	Jan. 10-Dec. 10
Uruguay	...	...	190	11.7	...	...		...	...	
Uzbekistan	5 153	32.9	5 153	33.1	1 250 185	79.8	Jan. 09-Dec. 09	1 482 014	95.2	Jan. 10-Dec. 10
Vanuatu	...	...	...	...	...	...		...	...	
Venezuela (Bolivarian Republic of)	103	0.7	...	...	...	...		...	...	
Viet Nam	479	1	676	1.3	777 256	15.5	Jan. 09-Dec. 09	1 132 374	22	Jan. 10-Dec. 10
Yemen	20	0.2	14	0.1	7 525	0.7	Jan. 09-Dec. 09	10 933	1	Jan. 10-Dec. 10
Zambia	1 563	27	1 689	28.7	1 582 621	273.9	Jan. 09-Dec. 09	1 318 975	224.1	Jan. 10-Dec. 10
Zimbabwe	1 560	25	1 218	19.2	1 142 052	182.9	Jan. 09-Dec. 09	1 612 388	254.8	Jan. 10-Dec. 10

a See the country classification by income, level of the epidemic and geographical, UNAIDS, UNICEF and WHO regions.

b This number should include all people aged 15 years and older who received HIV testing and counselling through any method or setting, including voluntary counselling and testing and antenatal care settings. Not all countries are able to report data from all settings.

c Some countries reported voluntary counselling and testing and antenatal care testing data separately; these data are combined here.

d Does not include data from all voluntary counselling and testing networks, and routine health sector testing may include significant repeat testing.

e Includes all people younger than 15 years who were tested.

f Only partial reporting available.

g Only data from Honiara is currently collated and available.

h Only 80% reporting available.

i Separate reports were received from Sudan for 2009 and 2010: testing and counselling facilities; northern Sudan, 132 (2009) and 189 (2010); southern Sudan, 78 (2009) and 92 (2010); number of people who received testing and counselling: northern Sudan, 52 770 (2009) and 49 966 (2010); southern Sudan, 50 502 (2009) and 58 837 (2010).

j Includes all people older than four years who were tested.

**Annex 3A.1** Percentage of people who inject drugs who received an HIV test in the past 12 months and who know the results, 2010<sup>a</sup>

Country	Percentage of people who inject drugs who received an HIV test in the past 12 months and who know the results	Numerator	Denominator	Year
Number of countries reporting	26			
Overall median	23%			
Sub-Saharan Africa ( <i>n</i> = 2)				
Mauritius	45%	228	511	2009
Nigeria	31%	480	1 545	2010
Median	...			
Latin America and the Caribbean ( <i>n</i> = 2)				
Brazil	13%	234	1 802	2010
Paraguay	12%	34	283	2007-2008
Median	...			
East, South and South-East Asia ( <i>n</i> = 11)				
Afghanistan	5%	1 033	20 000	2009
China	41%	24 265	59 878	2010
Indonesia	20%	138	681	2009
Iran (Islamic Republic of)	25%	631	2 530	2010
Malaysia	33%	208	630	2009
Myanmar	27%	248	908	2007-2008
Nepal	21%	64	300	2009
Pakistan	12%	352	2 979	2008
Philippines	1%	14	959	2009
Thailand	89%	356	399	2010
Viet Nam	18%	544	3 036	2009
Median	21%			
Europe and Central Asia ( <i>n</i> = 9)				
Albania	17%	33	200	2008
Armenia	20%	55	270	2010-2011
Georgia <sup>b</sup>	6%	64	1 127	2008-2009 <sup>b</sup>
Kazakhstan	61%	3 014	4 950	2010
Republic of Moldova	48%	153	326	2009-2010
Romania	19%	85	450	2009
Serbia	33%	121	371	2010
Tajikistan	27%	453	1 657	2009
Ukraine	26%	1 667	6 460	2009
Median	26%			
North Africa and the Middle East ( <i>n</i> = 2)				
Lebanon	66%	72	109	2008
Tunisia	21%	148	711	2009
Median	...			

<sup>a</sup> Country data may have been generated through surveys that are not nationally representative, and some survey results may overestimate the proportion of people accessing services. For instance, where reported coverage is close to 100%, they may represent people enrolled in treatment services or other settings where an HIV test is required to access the service.

<sup>b</sup> Butami (2008) and Tbilisi (2009).

**Annex 3A.2** Percentage of men who have sex with men who received an HIV test in the past 12 months and who know the result, 2010<sup>a</sup>

Country	Percentage of men who have sex with men who received an HIV test in the last 12 months and who know the results	Numerator	Denominator	Year
Number of countries reporting	41			
Overall median	32%			
Sub-Saharan Africa (n = 4)				
Burkina Faso	36%	133	373	2010
Mauritius	39%	140	362	2010
Nigeria	31%	486	1 545	2010
Togo	53%	335	630	2010
Median	...			
Latin America and the Caribbean (n = 11)				
Brazil	13%	243	1 829	2010
Chile	25%	118	471	2008-2009
Colombia	23%	571	2 494	2010
Costa Rica	63%	189	300	2009
Cuba	32%	81 517	251 529	2009
Dominican Republic	7%	115	1 565	2010
Guatemala <sup>b</sup>	38%	688 400	1 793 613	2010
Nicaragua	51%	488	948	2009
Panama	51%	293	575	2009
Paraguay	34%	173	506	2007-2008
Uruguay	26%	81	309	2010
Median	32%			
East, South and South-East Asia (n = 14)				
Bangladesh	9%	42	457	2010
Cambodia	51%	519	1 026	2010
China	49%	16 389	33 386	2010
Indonesia	16%	98	599	2009
Lao People's Democratic Republic	22%	66	300	2010
Malaysia	41%	212	517	2009
Mongolia	78%	149	192	2009
Myanmar	48%	262	550	2009
Nepal	41%	163	400	2009
Philippines	7%	296	4 367	2011
Thailand	17%	339	1 966	2010
Timor-Leste	33%	98	300	2010
Tonga	2%	2	100	2008
Viet Nam	19%	301	1 578	2009
Median	27%			
Europe and Central Asia (n = 11)				
Albania	45%	89	198	2008
Armenia	46%	124	270	2010-2011
Azerbaijan	10%	46	454	2010
Croatia	4%	4	103	2010
Georgia	26%	72	278	2010
Kazakhstan	60%	566	943	2010
Latvia	25%	180	734	2010
Republic of Moldova	12%	34	188	2009-2010
Romania	31%	718	2 328	2010
Serbia	34%	94	280	2010
Ukraine	43%	997	2 300	2009
Median	31%			
North Africa and the Middle East (n = 1)				
Tunisia	18%	214	1 178	2009

a Country data may have been generated through surveys that are not nationally representative, and some survey results may overestimate the proportion of people accessing services. For instance, where reported coverage is close to 100%, they may represent people enrolled in treatment services or other settings where an HIV test is required to access the service.

b The figures were extrapolated to the entire population of the country.

**Annex 3A.3 Percentage of sex workers who received an HIV test in the past 12 months and who know the results, 2010<sup>a</sup>**

Country	Percentage of sex workers who received an HIV test in the last 12 months and who knows the results	Numerator	Denominator	Year
Number of countries reporting	52			
Overall median	49%			
Sub-Saharan Africa (n = 15)				
Angola	35%	651	1 848	2008
Burkina Faso	83%	845	1 019	2010
Burundi	66%	382	576	2008
Chad <sup>b</sup>	38%	389	1 023	2010
Gabon	64%	385	601	2010
Gambia	83%	251	301	2010
Madagascar	60%	991	1 663	2008
Mali	71%	665	938	2009
Mauritius	42%	126	299	2010
Niger	45%	399	893	2008
Nigeria	60%	2 668	4 459	2010
Rwanda	89%	1 143	1 291	2010
Somalia	0%	0	237	2008
Togo	58%	278	476	2010
United Republic of Tanzania	95%	511	537	2010
Median	60%			
Latin America and the Caribbean (n = 10)				
Argentina	62%	257	415	2008
Brazil	18%	442	2 523	2009
Cuba	35%	28 837	82 838	2009
Dominican Republic	67%	913	1 367	2010
Guatemala	73%	44 428	60 533	2010
Jamaica	75%	207	277	2008
Nicaragua	55%	458	830	2010
Paraguay	52%	401	770	2007-2008
Suriname	63%	162	259	2009
Uruguay	26%	81	313	2010
Median	59%			
East, South and South-East Asia (n = 17)				
Bangladesh	38%	177	471	2010
Cambodia	98%	104	106	2010
China	34%	67 295	197 146	2010
Indonesia	25%	1 102	4 325	2009
Iran (Islamic Republic of)	28%	248	888	2010
Lao People's Democratic Republic	33%	297	912	2009
Malaysia	21%	215	1 003	2009
Mongolia	52%	438	835	2009
Myanmar	71%	394	554	2007-2008
Nepal	32%	161	500	2008
Pakistan	14%	606	4 446	2008
Papua New Guinea	46%	275	593	2010
Philippines	19%	1 711	9 206	2009
Sri Lanka	44%	481	1 094	2007-2008
Thailand	37%	1 531	4 121	2010
Timor-Leste	66%	120	181	2010
Viet Nam	35%	1 842	5 295	2009
Median	35%			

Europe and Central Asia (n = 8)				
Armenia	25%	62	250	2010-2011
Georgia	26%	72	280	2008-2009
Kazakhstan	80%	1 798	2 259	2010
Republic of Moldova	23%	84	298	2009-2010
Romania	27%	89	335	2010
Serbia	59%	147	250	2010
Tajikistan	56%	451	812	2009
Ukraine	59%	1 929	3 284	2009
Median	42%			
North Africa and the Middle East (n = 2)				
Lebanon	71%	107	150	2008
Tunisia	14%	56	397	2009
Median	...			

a Country data may have been generated through surveys that are not nationally representative, and some survey results may overestimate the proportion of people accessing services. For instance, where reported coverage is close to 100%, they may represent people enrolled in treatment services or other settings where an HIV test is required to access the service.

b Female sex workers.

**Annex 3B.1** Percentage of people who inject drugs who received an HIV test in the past 12 months and who know the results, 2006–2008 and 2009–2010<sup>a</sup>

Country	2006–2008	2009–2010
Number of countries reporting	13	13
Overall median	23%	25%
Sub-Saharan Africa ( <i>n</i> = 1)		
Nigeria	23%	31%
East, South and South-East Asia ( <i>n</i> = 6)		
China	42%	41%
Indonesia	36%	20%
Iran (Islamic Republic of)	23%	25%
Nepal	21%	21%
Philippines	4%	1%
Viet Nam	11%	18%
Median	22%	21%
Europe and Central Asia ( <i>n</i> = 6)		
Georgia <sup>b</sup>	9%	6%
Kazakhstan	52%	61%
Republic of Moldova	34%	48%
Romania	19%	19%
Serbia	33%	33%
Ukraine	29%	26%
Median	31%	29%

a Country data may have been generated through surveys that are not nationally representative, and some survey results may overestimate the proportion of people accessing services. For instance, where reported coverage is close to 100%, they may represent people enrolled in treatment services or other settings where an HIV test is required to access the service.

b The available surveys are from 2006 and 2008.

**Annex 3B.2** Percentage of men who have sex with men who received an HIV test in the past 12 months and who know the results, 2006–2008 and 2009–2010<sup>a</sup>

Country	2006–2008	2009–2010
Number of countries reporting	16	16
Overall median	30%	35%
Sub-Saharan Africa ( <i>n</i> = 2)		
Burkina Faso	28%	36%
Nigeria	30%	31%
Latin America and the Caribbean ( <i>n</i> = 1)		
Brazil	24%	13%
East, South and South-East Asia ( <i>n</i> = 9)		
Bangladesh	3%	9%
Cambodia	57%	51%
China	30%	49%
Indonesia	32%	16%
Lao People's Democratic Republic	5%	22%
Mongolia	81%	78%
Nepal	30%	41%
Philippines	16%	7%
Viet Nam	16%	19%
Median	30%	22%
Europe and Central Asia ( <i>n</i> = 4)		
Kazakhstan	44%	60%
Serbia	31%	34%
The former Yugoslav Republic of Macedonia	56%	98%
Ukraine	26%	43%
Median	...	...

<sup>a</sup> Country data may have been generated through surveys that are not nationally representative, and some survey results may overestimate the proportion of people accessing services. For instance, where reported coverage is close to 100%, they may represent people enrolled in treatment services or other settings where an HIV test is required to access the service.



**Annex 3B.3** Percentage of sex workers who received an HIV test in the past 12 months and who know the results, 2006-2008 and 2009-2010<sup>a</sup>

Country	2006-2008	2009-2010
Number of countries reporting	23	23
Overall median	39%	52%
Sub-Saharan Africa ( <i>n</i> = 7)		
Burundi <sup>b</sup>	71%	66%
Chad	34%	38%
Gabon	54%	64%
Madagascar <sup>c</sup>	49%	60%
Nigeria	39%	60%
Rwanda	65%	89%
Togo	40%	58%
Median	49%	60%
Latin America and the Caribbean ( <i>n</i> = 1)		
Dominican Republic	95%	67%
East, South and South-East Asia ( <i>n</i> = 10)		
Bangladesh	5%	38%
Cambodia	68%	98%
China	36%	34%
Indonesia	31%	25%
Iran (Islamic Republic of)	20%	28%
Lao People's Democratic Republic	18%	33%
Mongolia	53%	52%
Pakistan	8%	14%
Philippines	12%	19%
Viet Nam	15%	35%
Median	19%	33%
Europe and Central Asia ( <i>n</i> = 4)		
Georgia <sup>c</sup>	33%	26%
Kazakhstan	68%	80%
Republic of Moldova	31%	23%
Serbia	45%	59%
Ukraine	46%	59%
Median	45%	59%

a Country data may have been generated through surveys that are not nationally representative, and some survey results may overestimate the proportion of people accessing services. For instance, where reported coverage is close to 100%, they may represent people enrolled in treatment services or other settings where an HIV test is required to access the service.

b The available surveys are from 2007 and 2008.

c The available surveys are from 2006 and 2008.

**Annex 4 People of all ages receiving and needing antiretroviral therapy and coverage percentages, 2009 and 2010**

Low- and middle-income countries <sup>a</sup>	Reported number of people receiving antiretroviral therapy, 2009 <sup>b,c</sup>	Month and year of report	Reported number of people receiving antiretroviral therapy, 2010 <sup>b,c</sup>	Month and year of report	Estimated number of people needing antiretroviral therapy based on 2010 WHO guidelines, 2010 <sup>b,d</sup>			Estimated antiretroviral therapy coverage based on 2010 WHO guidelines, 2010 [range] <sup>b,e</sup>
					Estimate	Low estimate	High estimate	
Afghanistan	19 <sup>f</sup>	Dec. 09	46	Dec. 10	1 600	<1 000	5 400	3% [1-6%]
Albania	114	Dec. 09	145	Dec. 10	...			...
Algeria	1 526	Dec. 09	2 012	Dec. 10	6 200	4 700	8 100	32% [25-43%]
Angola	20 640	Dec. 09	27 931	Dec. 10	86 000	65 000	110 000	33% [25-43%]
Argentina	42 815	Dec. 09	43 313	Dec. 10	55 000	49 000	63 000	79% [68-89%]
Armenia	179	Dec. 09	250	Dec. 10	<1 000	<1 000	1 800	30% [14-49%]
Azerbaijan	238	Dec. 09	435	Dec. 10	1 400	1 000	1 800	32% [24-43%]
Bangladesh	353	Dec. 09	465	Dec. 10	1 400	1 000	1 800	33% [26-46%]
Belarus	1 776	Dec. 09	2 614	Dec. 10	5 100	3 500	7 900	51% [33-75%]
Belize	855	Dec. 09	1 053	Dec. 10	2 000	1 700	2 300	53% [47-60%]
Benin	15 401	Dec. 09	18 230	Dec. 10	31 000	28 000	35 000	58% [52-65%]
Bhutan	...		57	Dec. 10	<500	<200	<500	27% [20-45%]
Bolivia (Plurinational State of)	1 115	Dec. 09	1 283	Dec. 10	6 500	3 400	12 000	20% [10-37%]
Bosnia and Herzegovina	38	Dec. 09	48	Dec. 10	...			...
Botswana	145 190	Dec. 09	161 219	Dec. 10	170 000	170 000	180 000	93% [89->95%]
Brazil	185 982 <sup>f</sup>	Dec. 09	201 279	Dec. 10	290 000	270 000	310 000	70% [65-75%]
Bulgaria	327	Dec. 09	...		1 400	1 100	1 800	24% [19-30%]
Burkina Faso	26 448	Dec. 09	31 543	Dec. 10	64 000	57 000	72 000	49% [44-55%]
Burundi	17 661	Dec. 09	22 735	Dec. 10	68 000	57 000	73 000	34% [31-40%]
Cambodia	37 315	Dec. 09	42 799	Dec. 10	46 000	33 000	63 000	92% [68->95%]
Cameroon	76 228	Dec. 09	89 455	Dec. 10	230 000	210 000	270 000	38% [34-43%]
Cape Verde	611	Dec. 09	...		1 400	1 000	1 900	43% [32-61%]
Central African Republic	14 474	Dec. 09	15 287	Dec. 10	64 000	58 000	72 000	24% [21-27%]
Chad	32 288	Dec. 09	32 288	Dec. 10	83 000	71 000	97 000	39% [33-46%]
Chile	12 762	Dec. 09	12 789	Dec. 10	15 000	8 700	25 000	88% [52->95%]
China	65 481	Dec. 09	86 122	Dec. 10	270 000	230 000	330 000	32% [26-37%]
Colombia	16 302	Dec. 09	29 803	Dec. 10	88 000	67 000	120 000	34% [26-45%]
Comoros	12	Dec. 09	17	Dec. 10	<100	<100	<100	>95% [35->95%]
Congo	7 998	Dec. 09	14 830	Dec. 10	35 000	30 000	41 000	42% [36-49%]
Cook Islands	...		0	Dec. 10	...			...
Costa Rica	3 064	Dec. 09	3 265	Dec. 10	5 100	4 300	5 800	65% [57-76%]
Côte d'Ivoire	72 011	Dec. 09	75 237	Sept. 10	200 000	180 000	220 000	37% [34-41%]
Croatia	441	Dec. 09	510	Dec. 10	<1 000	<500	<1 000	89% [70->95%]
Cuba	5 034	Dec. 09	5 587	Dec. 10	5 900	4 900	7 200	95% [78->95%]
Democratic People's Republic of Korea	...		...		<1 000	<500	<1 000	...
Democratic Republic of the Congo	34 967	Dec. 09	43 878	Dec. 10	300 000	270 000	340 000	14% [13-16%]
Djibouti	913	Dec. 09	1 008	Dec. 10	5 700	4 600	7 800	18% [13-22%]
Dominica	38	Dec. 09	41	Dec. 10	...			...
Dominican Republic	13 785	Dec. 09	17 082	Dec. 10	24 000	21 000	28 000	72% [62-82%]
Ecuador	5 538	Dec. 09	8 977	Dec. 10	14 000	9 900	20 000	63% [45-91%]
Egypt	359	Dec. 09	525	Dec. 10	5 100	2 500	13 000	10% [4-21%]
El Salvador	... <sup>f</sup>		5 843	Dec. 10	9 900	7 100	16 000	59% [36-82%]
Equatorial Guinea	1 645	Dec. 09	2 432	Dec. 10	9 900	6 600	14 000	24% [18-37%]
Eritrea	4 955	Dec. 09	5 387	Dec. 10	13 000	7 900	23 000	42% [23-68%]

Low- and middle-income countries <sup>a</sup>	Reported number of people receiving antiretroviral therapy, 2009 <sup>b,c</sup>	Month and year of report	Reported number of people receiving antiretroviral therapy, 2010 <sup>b,c</sup>	Month and year of report	Estimated number of people needing antiretroviral therapy based on 2010 WHO guidelines, 2010 <sup>b,d</sup>			Estimated antiretroviral therapy coverage based on 2010 WHO guidelines, 2010 [range] <sup>b,e</sup>
					Estimate	Low estimate	High estimate	
Ethiopia	176 632	Dec. 09	222 723	Dec. 10	... <sup>h</sup>			...
Fiji	52	Nov. 09	58	Dec. 10	<200	<200	<500	33% [24-43%]
Gabon	9 976	Dec. 09	11 488	Dec. 10	22 000	15 000	31 000	53% [38-75%]
Gambia	921	Sept. 09	1 869	Dec. 10	5 400	2 400	11 000	35% [17-78%]
Georgia	655	Dec. 09	830	Dec. 10	1 300	<1 000	4 100	65% [20->95%]
Ghana	30 265	Dec. 09	40 575	Dec. 10	110 000	100 000	130 000	35% [31-40%]
Grenada	54	Dec. 09	61	Dec. 10	...			...
Guatemala	10 362	Dec. 09	12 053	Dec. 10	23 000	14 000	52 000	53% [23-89%]
Guinea	14 999	Dec. 09	20 430	Dec. 10	36 000	31 000	43 000	57% [47-67%]
Guinea-Bissau	2 764	Dec. 09	3 632	Dec. 10	7 600	6 200	9 300	48% [39-59%]
Guyana	2 832	Dec. 09	3 059	Dec. 10	3 600	2 800	5 200	84% [59->95%]
Haiti	26 007	Dec. 09	29 180	Dec. 10	57 000	50 000	65 000	51% [45-58%]
Honduras	7 075	Dec. 09	7 718	Dec. 10	15 000	12 000	20 000	51% [39-65%]
Hungary	547	Dec. 09	630	Dec. 10	1 700	1 300	2 100	38% [30-48%]
India	320 074	Dec. 09	424 802	Dec. 10	... <sup>h</sup>	1 100 000	1 400 000	... [30-38%]
Indonesia	15 442	Nov. 09	19 572	Dec. 10	82 000	55 000	120 000	24% [17-35%]
Iran (Islamic Republic of)	1 486	Jan. 10	1 800	Sept. 10	26 000	23 000	30 000	7% [6-8%]
Iraq	...		5	Dec. 10	...			...
Jamaica	7 244	Dec. 09	8 016	Dec. 10	14 000	12 000	17 000	57% [46-69%]
Jordan	63	Dec. 09	83	Dec. 10	...			...
Kazakhstan	1 035	Jan. 10	1 336	Dec. 10	4 400	3 900	5 100	30% [26-35%]
Kenya	336 980	Dec. 09	432 621	Dec. 10	710 000	650 000	770 000	61% [56-66%]
Kiribati	...		6	Dec. 10	...			...
Kyrgyzstan	231	Jan. 10	548	Dec. 10	4 600	2 700	7 800	12% [7-21%]
Lao People's Democratic Republic	1 345	Dec. 09	1 690	Dec. 10	3 300	2 300	5 100	51% [33-73%]
Latvia	439	Dec. 09	508	Dec. 10	2 800	2 200	3 500	18% [14-23%]
Lebanon	354	Dec. 09	412	Dec. 10	1 100	<1 000	1 600	37% [25-55%]
Lesotho	61 736	Dec. 09	76 487 <sup>g</sup>	Dec. 10	130 000	130 000	140 000	57% [53-60%]
Liberia	2 970	Dec. 09	4 412	Dec. 10	16 000	14 000	19 000	27% [23-32%]
Libya	...		...		...			...
Lithuania	145	Dec. 09	...		<1 000	<500	<1 000	27% [21-34%]
Madagascar	214	Dec. 09	248	Dec. 10	19 000	14 000	25 000	1% [1-2%]
Malawi	198 846	Dec. 09	250 987	Dec. 10	... <sup>h</sup>	440 000	510 000	... [49-57%]
Malaysia	9 962	Mar. 10	13 918	Dec. 10	38 000	31 000	51 000	36% [27-44%]
Maldives	3	Dec. 09	2	Dec. 10	<100	<100	<100	14% [11-17%]
Mali	21 100	Dec. 09	24 778	Dec. 10	53 000	45 000	63 000	46% [39-56%]
Marshall Islands	4	Dec. 09	6	Dec. 10	...			...
Mauritania	1 401	Dec. 09	1 669	Dec. 10	7 600	5 100	12 000	22% [14-33%]
Mauritius	652	Dec. 09	646	Dec. 10	4 100	3 500	4 800	16% [14-18%]
Mexico	60 911	Dec. 09	64 487	Dec. 10	83 000	57 000	110 000	78% [59->95%]
Micronesia (Federated States of)	5	Dec. 09	5	Dec. 10	...			...
Mongolia	9	Dec. 09	28	Dec. 10	<200	<100	<200	26% [19-39%]
Montenegro	31	Mar. 10	40	Dec. 10	...			...
Morocco	2 647	Dec. 09	3 200	Dec. 10	11 000	8 200	17 000	30% [19-39%]

Low- and middle-income countries <sup>a</sup>	Reported number of people receiving antiretroviral therapy, 2009 <sup>b,c</sup>	Month and year of report	Reported number of people receiving antiretroviral therapy, 2010 <sup>b,c</sup>	Month and year of report	Estimated number of people needing antiretroviral therapy based on 2010 WHO guidelines, 2010 <sup>b,d</sup>			Estimated antiretroviral therapy coverage based on 2010 WHO guidelines, 2010 [range] <sup>b,e</sup>
					Estimate	Low estimate	High estimate	
Mozambique	170 198	Dec. 09	218 991	Dec. 10	550 000	480 000	610 000	40% [36-46%]
Myanmar	21 138	Dec. 09	29 825	Dec. 10	120 000	110 000	140 000	24% [21-27%]
Namibia	70 498	Sept. 09	88 717	Dec. 10	98 000	84 000	110 000	90% [78->95%]
Nauru	...		0	Dec. 10	...			...
Nepal	3 226	Jul. 09	4 867	Dec. 10	27 000	19 000	45 000	18% [11-26%]
Nicaragua	1 063	Dec. 09	1 286	Dec. 10	1 100	<500	2 900	>95% [45->95%]
Niger	6 445	Dec. 09	7 812	Dec. 10	27 000	24 000	30 000	29% [26-33%]
Nigeria	302 973	Dec. 09	359 181	Dec. 10	1 400 000	1 300 000	1 500 000	26% [24-28%]
Niue	...		0	Dec. 10	...			...
Oman	486	Dec. 09	469	Dec. 10	1 100	<1 000	1 400	44% [33-54%]
Pakistan	1 320	Dec. 09	1 892	Dec. 10	22 000	14 000	50 000	9% [4-13%]
Palau	3	Dec. 09	3	Dec. 10	...			...
Panama	4 463	Dec. 09	4 888	Dec. 10	13 000	9 100	22 000	36% [22-54%]
Papua New Guinea	6 751	Dec. 09	7 555	Dec. 10	14 000	12 000	17 000	54% [43-65%]
Paraguay	2 073	Dec. 09	2 962	Nov. 10	4 500	2 600	7 700	66% [38->95%]
Peru	14 780	Dec. 09	...		26 000	18 000	36 000	57% [41-84%]
Philippines	750	Dec. 09	1 274	Dec. 10	2 500	1 500	3 400	51% [38-83%]
Poland	4 329	Dec. 09	4 897	Dec. 10	14 000	11 000	20 000	34% [25-44%]
Republic of Moldova	984	Dec. 09	1 237	Dec. 10	4 900	4 200	5 800	25% [21-30%]
Romania	7 244	Dec. 09	7 276	Dec. 10	11 000	9 400	12 000	69% [60-77%]
Russian Federation	75 900	Dec. 09	79 430	Dec. 10	... <sup>h</sup>	270 000	380 000	... [21-29%]
Rwanda	76 726	Dec. 09	91 984	Dec. 10	100 000	96 000	120 000	88% [76->95%]
Saint Kitts and Nevis	...		...		...			...
Saint Lucia	124	Dec. 09	...		...			...
Saint Vincent and the Grenadines	162	Dec. 09	...		...			...
Samoa	...		13	Dec. 10	...			...
Sao Tome and Principe	169	Dec. 09	196	Dec. 10	<1 000	<500	<1 000	34% [25-46%]
Senegal	12 249	Dec. 09	...		25 000	19 000	31 000	50% [39-64%]
Serbia	790	Dec. 09	915	Dec. 10	2 700	2 000	3 500	34% [26-45%]
Seychelles	139	Dec. 09	156	Dec. 10	...			...
Sierra Leone	3 660	Dec. 09	5 552	Dec. 10	18 000	15 000	21 000	31% [27-38%]
Slovakia	...		118	Dec. 10	<200	<200	<200	81% [63->95%]
Solomon Islands	4	Dec. 09	7	Dec. 10	...			...
Somalia	578	Dec. 09	878	Dec. 10	25 000	18 000	33 000	3% [3-5%]
South Africa	971 556	Oct. 09	1 389 865	Dec. 10	2 500 000	2 400 000	2 700 000	55% [52-58%]
Sri Lanka	207	Dec. 09	256	Dec. 10	1 000	<1 000	1 300	25% [19-34%]
Sudan	3 825	Dec. 09	4 345	Dec. 10	93 000	60 000	140 000	5% [3-7%]
Suriname	996	Jul. 09	1 106	Dec. 10	2 500	1 700	3 700	45% [30-64%]
Swaziland	47 241	Dec. 09	59 802	Dec. 10	83 000	79 000	89 000	72% [67-76%]
Syrian Arab Republic	99	Dec. 09	110	Dec. 10	...			...
Tajikistan	322	Dec. 09	504	Dec. 10	3 200	1 900	5 800	16% [9-27%]
Thailand	216 118	Sept. 09	236 808	Sept. 10	350 000	280 000	430 000	67% [55-85%]
The former Yugoslav Republic of Macedonia	24	Dec. 09	36	Dec. 10	...			...
Timor-Leste	31	Dec. 09	39	Dec. 10	...			...

Low- and middle-income countries <sup>a</sup>	Reported number of people receiving antiretroviral therapy, 2009 <sup>b,c</sup>	Month and year of report	Reported number of people receiving antiretroviral therapy, 2010 <sup>b,c</sup>	Month and year of report	Estimated number of people needing antiretroviral therapy based on 2010 WHO guidelines, 2010 <sup>b,d</sup>			Estimated antiretroviral therapy coverage based on 2010 WHO guidelines, 2010 [range] <sup>b,e</sup>
					Estimate	Low estimate	High estimate	
Togo	16 710	Dec. 09	24 635	Dec. 10	49 000	44 000	56 000	50% [44-56%]
Tonga	...		0	Dec. 10	...			...
Tunisia	412	Dec. 09	412	Dec. 10	4 000	1 700	13 000	10% [3-24%]
Turkey	1 000	Dec. 09	1 000	Dec. 10	1 800	1 400	2 200	56% [45-72%]
Turkmenistan	...		...		...			...
Tuvalu	1	Dec. 09	0	Dec. 10	...			...
Uganda	200 413	Sept. 09	248 222	Sept. 10	530 000	490 000	580 000	47% [43-51%]
Ukraine	15 871	Dec. 09	22 697	Dec. 10	170 000	140 000	220 000	13% [11-16%]
United Republic of Tanzania	199 413	Dec. 09	258 069	Dec. 10	610 000	570 000	660 000	42% [39-46%]
Uruguay	2 510	Dec. 09	3 124	Dec. 10	4 400	2 900	9 900	71% [32->95%]
Uzbekistan	1 753	Dec. 09	2 479	Dec. 10	8 900	5 300	15 000	28% [16-47%]
Vanuatu	2	Dec. 09	2	Dec. 10	...			...
Venezuela (Bolivarian Republic of)	32 302	Dec. 09	37 827	Dec. 10	67 000	55 000	80 000	57% [47-69%]
Viet Nam	37 995	Dec. 09	49 492	Dec. 10	96 000	81 000	110 000	52% [43-61%]
Yemen	274	Dec. 09	531	Dec. 10	...			...
Zambia	283 863	Dec. 09	344 407	Dec. 10	480 000	450 000	510 000	72% [67-77%]
Zimbabwe	218 589	Feb. 10	326 241	Dec. 10	560 000	520 000	600 000	59% [54-62%]

High-income countries <sup>a</sup>	Reported number of people receiving antiretroviral therapy, 2005–2009	Month and year of report	Reported number of people receiving antiretroviral therapy, 2010	Month and year of report
Andorra	27	Dec. 09	...	
Antigua and Barbuda	98	Dec. 09	153	Dec. 10
Australia	9 933	Dec. 07	11 120	Dec. 10
Austria	1 800	Sept. 09	3 163	Dec. 10
Bahamas	1 506	Dec. 09	...	
Bahrain	...		...	
Barbados	804	Dec. 09	847	Dec. 10
Belgium	8 690	Dec. 09	...	
Brunei Darussalam	...		17	Dec. 10
Canada	27 000	Dec. 08	...	
Cyprus	187	Dec. 09	198	Dec. 10
Czech Republic	706	Oct. 09	760	Dec. 10
Denmark	3 000	Oct. 09	3 000	Dec. 10
Estonia	1 263	Dec. 09	1 793	Dec. 10
Finland	450	Aug. 06	...	
France	79 680	Dec. 08	93 090	Dec. 10
Germany	42 900	Dec. 09	...	
Greece	4 236	Dec. 08	5 114	Dec. 10
Iceland	100 <sup>j</sup>	<05	...	
Ireland	1 600	Dec. 05	...	
Israel	2 876	Dec. 08	2 745	Jun. 10
Italy	95 000	Dec. 08	...	

High-income countries <sup>a</sup>	Reported number of people receiving antiretroviral therapy, 2005–2009	Month and year of report	Reported number of people receiving antiretroviral therapy, 2010	Month and year of report
Japan	94	Mar. 09	...	
Kuwait	131	Dec. 09	...	
Luxembourg	434	Dec. 09	...	
Malta	100	Dec. 09	119	Dec. 10
Monaco	45	Dec. 05	...	
Netherlands	7 919	Apr. 07	11 780	Dec. 10
New Zealand	1 204	Jun. 09	1 348	Dec. 10
Norway	900	Dec. 05	...	
Portugal	18 107	Dec. 09	...	
Qatar	70	Jan. 09	...	
Republic of Korea	...		...	
San Marino	...		...	
Saudi Arabia	865	Dec. 08	...	
Singapore	...		...	
Slovenia	157	Jul. 07	...	
Spain	79 500	Dec. 09	85 700	Dec. 10
Sweden	4 185	Dec. 09	...	
Switzerland	...		...	
Trinidad and Tobago	2 639	Dec. 09	1 485	Dec. 10
United Arab Emirates	121	Dec. 09	...	
United Kingdom	50 292 <sup>i</sup>	Dec. 09	...	
United States of America	268 000 <sup>j</sup>	<05	...	

... Data not available or not applicable.

a See the country classification by income, level of the epidemic and geographical, UNAIDS, UNICEF and WHO regions (Annex 10).

b Annex 5 provides antiretroviral therapy data by age and sex.

c Private sector data have been included in the total number of people on treatment, when available:

Country	2010
Argentina	13 429
Bangladesh	465
Botswana	13 610
Burundi	11 533
Cambodia	3 603
Congo	299
Djibouti	28
Eritrea	601
Ethiopia	6 500
Gabon	475
Gambia	946
Guinea-Bissau	1 566
Guyana	907
India	35 000
Liberia	1 999
Namibia	2 760
Niger	516
Pakistan	434
Papua New Guinea	676
Rwanda	1 316
Sierra Leone	340
Swaziland	11 001
Togo	456
United Republic of Tanzania	35
Uruguay	1 100
Zambia	9 696

d The needs estimates are based on the methods described in the explanatory notes and in Box 5.9.

e The coverage estimates are based on the estimated unrounded numbers of people receiving antiretroviral therapy and the estimated unrounded need for antiretroviral therapy (based on UNAIDS/WHO methods). The ranges in coverage estimates are based on plausibility bounds in the denominator; that is, low and high estimates of need.

f Updated 2009 value. See last year's annex ([http://www.who.int/entity/hiv/data/taupr2010\\_annex3.xls](http://www.who.int/entity/hiv/data/taupr2010_annex3.xls)).

g Since it only reflects 90% of the data received from facilities, this number is underreported.

h Estimates of the number of people needing antiretroviral therapy are currently being reviewed and will be adjusted, as appropriate, based on ongoing data collection and analysis. Some countries have therefore requested that only a range be published or no needs estimate at all.

i Two separate reports were received for 2010 from Sudan: northern Sudan, 2122; southern Sudan, 2223. The figures reflect the situation as of 2010 before the declaration of independence of South Sudan.

j <05 indicates that data exist but no update has been received since December 2004. These data should be interpreted cautiously, as they may reflect the situation in early 2004 or even 2003.

**Annex 5** Reported number of people receiving antiretroviral therapy in low- and middle-income countries by sex and by age, and estimated number of children receiving and needing antiretroviral therapy and coverage percentages, 2010

Low- and middle-income countries <sup>a</sup>	Reported number of males and females receiving antiretroviral therapy						Reported number of adults and children receiving antiretroviral therapy						Estimated number of children needing antiretroviral therapy based on UNAIDS/WHO methods, 2010 <sup>b</sup>				Estimated antiretroviral therapy coverage among children, December 2010 <sup>c</sup>		
	Month and year of report	Males	% of total	Females	% of total	Month and year of report	Adults (+15)	% of total	Children (<15)	% of total	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate			
Afghanistan	Dec. 10	30	65%	16	35%	Dec. 10	45	98%	1	2%	...	<100	<1000	...	<1%	2%			
Albania	Dec. 10	96	66%	49	34%	Dec. 10	133	92%	12	8%	...	...	...	...	...	...			
Algeria	Dec. 09 <sup>de</sup>	762	51%	739	49%	Dec. 10	1 906	95%	106	5%	...	<500	<500	...	23%	51%			
Angola	Dec. 10	12 912	46%	15 019	54%	Dec. 10	26 015	93%	1 916	7%	19 000	14 000	26 000	10%	7%	14%			
Argentina	Dec. 10	25 901	60%	17 412	40%	Dec. 10	42 027	97%	1 286	3%	...	3 200	3 400	...	38%	41%			
Armenia	Dec. 10	161	64%	89	36%	Dec. 10	240	96%	10	4%	...	<100	<100	...	40%	>95%			
Azerbaijan	Dec. 10	334	77%	101	23%	Dec. 10	426	98%	9	2%	...	<100	<100	...	50%	60%			
Bangladesh	Dec. 10	302	65%	163	35%	Dec. 10	442	95%	23	5%	...	<100	<200	...	14%	32%			
Belarus	Dec. 10	1 439	55%	1 175	45%	Dec. 10	2 493	95%	121	5%	...	<200	<200	...	>95%	>95%			
Belize	Dec. 10	523	50%	530	50%	Dec. 10	957	91%	96	9%	...	<200	<200	...	50%	92%			
Benin	Dec. 09 <sup>e</sup>	6 468	42%	8 933	58%	Dec. 10	16 930	93%	1 300	7%	5 800	4 700	7 000	23%	19%	27%			
Bhutan	Dec. 10	30	53%	27	47%	Dec. 10	54	95%	3	5%	...	<100	<100	...	12%	25%			
Bolivia (Plurinational State of)	Dec. 10	829	65%	454	35%	Dec. 10	1 226	96%	57	4%	...	<100	<500	...	13%	70%			
Bosnia and Herzegovina	Dec. 10	38	79%	10	21%	Dec. 10	47	98%	1	2%	...	...	...	...	...	...			
Botswana	Dec. 10	63 112	39%	98 107	61%	Dec. 10	151 171	94%	10 048	6%	11 000	10 000	13 000	88%	79%	>95%			
Brazil	Dec. 10	122 662	61%	78 617	39%	Dec. 10	195 373	97%	5 906	3%	...	7 200	9 400	...	63%	82%			
Bulgaria	Dec. 09	223	68%	104	32%	Dec. 09	324	99%	3	1%	...	<100	<100	...	4%	11%			
Burkina Faso	Dec. 10	10 092	32%	21 451	68%	Dec. 10	30 144	96%	1 399	4%	14 000	12 000	16 000	10%	9%	12%			
Burundi	Dec. 10	7 636	34%	15 099	66%	Dec. 10	20 909	92%	1 826	8%	14 000	12 000	16 000	13%	11%	16%			
Cambodia	Dec. 10	20 241	47%	22 558	53%	Dec. 10	38 697	90%	4 102	10%	...	4 400	8 500	...	48%	93%			
Cameroon	Dec. 10	29 153	33%	60 302	67%	Dec. 10	85 461	96%	3 994	4%	36 000	30 000	44 000	11%	9%	13%			
Cape Verde	Dec. 09	272	45%	339	55%	Dec. 09	574	94%	37	6%	...	<200	<500	...	15%	35%			
Central African Republic	Dec. 10	4 696	31%	10 591	69%	Dec. 10	14 462	95%	825	5%	11 000	9 700	13 000	7%	6%	8%			
Chad	Dec. 10 <sup>d</sup>	11 888	38%	19 400	62%	Dec. 10	31 312	97%	976	3%	19 000	15 000	23 000	5%	4%	6%			
Chile	Dec. 10	10 671	83%	2 118	17%	Dec. 10	12 583	98%	206	2%	...	<200	<1000	...	37%	>95%			
China	Dec. 10 <sup>d</sup>	51 867	60%	34 188	40%	Dec. 10	84 273	98%	1 849	2%	...	6 300	12 000	...	15%	29%			

Low- and middle-income countries <sup>a</sup>	Reported number of males and females receiving antiretroviral therapy						Reported number of adults and children receiving antiretroviral therapy						Estimated number of children needing antiretroviral therapy based on UNAIDS/WHO methods, 2010 <sup>b</sup>				Estimated antiretroviral therapy coverage among children, December 2010 <sup>c</sup>		
	Month and year of report	Males	% of total	Females	% of total	Month and year of report	Adults (>15)	% of total	Children (<15)	% of total	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate			
Colombia	Dec. 09 <sup>de</sup>	12 254	75%	4 043	25%		...		...		...	2 000	2 100	...	...				
Comoros	Dec. 10	6	35%	11	65%	Dec. 10	16	94%	1	6%	...	<100	<100	...	10%	>95%			
Congo	Dec. 10	4 958	33%	9 872	67%	Dec. 10	13 286	90%	1 544	10%	7 400	6 100	9 000	2 1%	17%	25%			
Cook Islands		...		...			...		...		...	...	...	...	...				
Costa Rica		...		...		Dec. 10	3 204	98%	61	2%	...	<500	<500	...	16%	30%			
Côte d'Ivoire	Sept. 10	22 799	30%	52 438	70%	Sept. 10	70 687	94%	4 550	6%	37 000	31 000	43 000	12%	11%	15%			
Croatia	Dec. 10 <sup>d</sup>	431	84%	81	16%	Dec. 10 <sup>d</sup>	507	99%	5	1%	...	<100	<100	...	28%	63%			
Cuba	Dec. 10	4 522	81%	1 065	19%	Dec. 10	5 565	100%	22	0%	...	<100	<100	...	31%	79%			
Democratic People's Republic of Korea		...		...			...		...		...	<100	<100	...	...				
Democratic Republic of the Congo	Dec. 10	16 659	38%	27 219	62%	Dec. 10	37 941	86%	5 937	14%	72 000	71 000	73 000	8%	8%	8%			
Djibouti	Dec. 10 <sup>d</sup>	458	45%	558	55%	Dec. 10	978	97%	30	3%	1 100	<1 000	1 600	3%	2%	3%			
Dominica	Dec. 10	27	66%	14	34%	Dec. 10	41	100%	0	0%	...	...	...	...	...				
Dominican Republic	Dec. 10	9 908	58%	7 174	42%	Dec. 10	16 445	96%	637	4%	...	1 400	2 500	...	25%	46%			
Ecuador		...		...		Dec. 10	8 557	95%	420	5%	...	<500	<500	...	>95%	>95%			
Egypt		...		...		Dec. 10	493	94%	32	6%	...	<200	<1 000	...	5%	28%			
El Salvador	Dec. 10 <sup>d</sup>	3 564	61%	2 278	39%	Dec. 10	5 553	95%	290	5%	...	<500	<1 000	...	29%	88%			
Equatorial Guinea	Dec. 08 <sup>e</sup>	235	28%	604	72%	Dec. 10	2 387	98%	45	2%	2 200	1 400	3 200	2%	1%	3%			
Eritrea	Dec. 10	2 407	45%	2 980	55%	Dec. 10	5 276	98%	111	2%	2 600	1 600	4 700	4%	2%	7%			
Ethiopia	Dec. 10 <sup>d</sup>	74 463	42%	102 505	58%	Dec. 10	208 667	94%	14 056	6%	...	...	...	...	...				
Fiji	Dec. 10	27	47%	31	53%	Dec. 10	57	98%	1	2%	...	<100	<100	...	5%	10%			
Gabon	Dec. 10 <sup>d</sup>	3 855	35%	7 158	65%	Dec. 10	11 117	97%	371	3%	2 000	1 200	3 100	19%	12%	31%			
Gambia	Dec. 10	584	31%	1 285	69%	Dec. 10	1 708	91%	161	9%	...	<500	2 200	...	7%	40%			
Georgia	Dec. 10	581	70%	249	30%	Dec. 10	796	96%	34	4%	...	<100	<100	...	>95%	>95%			
Ghana	Dec. 10 <sup>d</sup>	15 225	32%	32 334	68%	Dec. 10	37 933	93%	2 642	7%	20 000	17 000	24 000	13%	11%	16%			
Grenada	Dec. 10	35	57%	26	43%	Dec. 10	60	98%	1	2%	...	...	...	...	...				
Guatemala	Dec. 10	6 957	58%	5 096	42%	Dec. 10	11 392	95%	661	5%	...	<1 000	3 800	...	17%	75%			
Guinea	Dec. 10	7 985	39%	12 445	61%	Dec. 10	19 508	95%	922	5%	6 600	5 200	8 600	14%	11%	18%			
Guinea-Bissau	Dec. 10	1 035	28%	2 597	72%	Dec. 10	3 451	95%	181	5%	1 200	<1 000	1 600	15%	11%	18%			



Low- and middle-income countries <sup>a</sup>	Reported number of males and females receiving antiretroviral therapy						Reported number of adults and children receiving antiretroviral therapy						Estimated number of children needing antiretroviral therapy based on UNAIDS/WHO methods, 2010 <sup>b</sup>				Estimated antiretroviral therapy coverage among children, December 2010 <sup>c</sup>			
	Month and year of report	Males	% of total	Females	% of total	Month and year of report	Adults (+15)	% of total	Children (<15)	% of total	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate				
Guyana	Dec.10	1 369	45%	1 690	55%	Dec.10	2 882	94%	177	6%	...	<200	<500	...	62%	>95%				
Haiti	Dec.10	11 866	41%	17 314	59%	Dec.10	27 622	95%	1 558	5%	8 200	6 800	9 800	19%	16%	23%				
Honduras	Dec.10	3 772	49%	3 946	51%	Dec.10	6 974	90%	744	10%	...	1 100	2 400	...	30%	67%				
Hungary	...	...	...	...	...	...	...	...	...	...	...	<100	<100	...	>95%	>95%				
India	Dec.10 <sup>d</sup>	223 725	58%	162 261	42%	Dec.10	401 906	95%	22 896	5%	...	39 000	97 000	...	24%	59%				
Indonesia	Dec.10 <sup>d</sup>	12 426	73%	4 652	27%	Dec.10	18 813	96%	759	4%	...	2 400	6 600	...	11%	31%				
Iran (Islamic Republic of)	Sept.10	1 422	79%	378	21%	Sept.10	1 748	97%	52	3%	...	<500	<500	...	14%	19%				
Iraq	Dec.10	5	100%	0	0%	Dec.10	5	100%	0	0%	...	...	...	...	...	...				
Jamaica	Dec.10	3 767	47%	4 249	53%	Dec.10	7 529	94%	487	6%	...	<500	<1 000	...	69%	>95%				
Jordan	Dec.10	65	78%	18	22%	Dec.10	81	98%	2	2%	...	...	...	...	...	...				
Kazakhstan	Dec.10 <sup>d</sup>	734	65%	390	35%	Dec.10	1 124	84%	212	16%	...	<100	<100	...	>95%	>95%				
Kenya	Dec.10	168 722	39%	263 899	61%	Dec.10	396 525	92%	36 096	8%	170 000	150 000	200 000	21%	18%	25%				
Kiribati	Dec.10	3	50%	3	50%	Dec.10	5	83%	1	17%	...	...	...	...	...	...				
Kyrgyzstan	Jan.10 <sup>e</sup>	158	68%	73	32%	Dec.10	411	75%	137	25%	...	<200	<500	...	28%	79%				
Lao People's Democratic Republic	Dec.10	874	52%	816	48%	Dec.10	1 573	93%	117	7%	...	<500	<1 000	...	18%	50%				
Latvia	Dec.10	352	69%	156	31%	Dec.10	480	94%	28	6%	...	<100	<100	...	78%	>95%				
Lebanon	Dec.10	344	83%	68	17%	Dec.10	408	99%	4	1%	...	<100	<200	...	3%	7%				
Lesotho	Dec.10	28 349	37%	48 138	63%	Dec.10	71 686	94%	4 801	6%	21 000	19 000	24 000	22%	20%	25%				
Liberia	Dec.10 <sup>d</sup>	772	32%	1 641	68%	Dec.10	4 098	93%	314	7%	3 100	2 500	4 000	10%	8%	13%				
Libya	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...				
Lithuania	Dec.09	113	78%	32	22%	Dec.09	143	99%	2	1%	...	<100	<100	...	11%	20%				
Madagascar	Dec.10	98	40%	150	60%	Dec.10	230	93%	18	7%	...	2 300	4 700	...	<1%	1%				
Malawi	...	...	...	...	...	Dec.10	228 478	91%	22 509	9%	...	93 000	120 000	...	19%	24%				
Malaysia	Dec.10	9 325	67%	4 593	33%	Dec.10	13 382	96%	536	4%	...	1 000	1 900	...	28%	52%				
Maldives	Dec.10	2	100%	0	0%	Dec.10	2	100%	0	0%	...	<100	<100	...	0%	0%				
Mali	Dec.10	8 192	33%	16 586	67%	Dec.10	23 386	94%	1 392	6%	...	6 600	11 000	...	13%	21%				
Marshall Islands	Dec.09 <sup>e</sup>	1	25%	3	75%	Dec.09 <sup>e</sup>	4	100%	0	0%	...	...	...	...	...	...				
Mauritania	Dec.10	824	49%	845	51%	Dec.10	1 607	96%	62	4%	...	<1 000	1 700	...	4%	10%				

Low- and middle-income countries <sup>a</sup>	Reported number of males and females receiving antiretroviral therapy						Reported number of adults and children receiving antiretroviral therapy						Estimated number of children needing antiretroviral therapy based on UNAIDS/WHO methods, 2010 <sup>b</sup>				Estimated antiretroviral therapy coverage among children, December 2010 <sup>c</sup>		
	Month and year of report	Males	% of total	Females	% of total	Month and year of report	Adults (+15)	% of total	Children (<15)	% of total	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate			
Mauritius	Dec.10	550	85%	96	15%	Dec.10	640	99%	6	1%	...	<100	<100	...	13%	29%			
Mexico	Dec.10	50 031	78%	14 456	22%	Dec.10	62 840	97%	1 647	3%	...	1 600	1 900	...	86%	>95%			
Micronesia (Federated States of)	Dec.10	2	40%	3	60%	Dec.10	5	100%	0	0%	...	<100	<100	...	0%	0%			
Mongolia	Dec.10	23	82%	5	18%	Dec.10	28	100%	0	0%	...	<100	<100	...	0%	0%			
Montenegro	Dec.10	36	90%	4	10%	Dec.10	39	98%	1	3%	...	<500	<500	...	17%	42%			
Morocco	Dec.10	1 659	52%	1 541	48%	Dec.10	3 032	95%	168	5%	91 000	75 000	110 000	19%	16%	23%			
Mozambique	Dec.10	79 553	36%	139 438	64%	Dec.10	201 596	92%	17 395	8%	...	2 700	4 800	...	44%	77%			
Myanmar	Dec.10	16 768	56%	13 057	44%	Dec.10	27 715	93%	2 110	7%	10 000	9 200	12 000	87%	74%	>95%			
Namibia	Dec.10 <sup>d</sup>	30 814	36%	55 143	64%	Dec.10	79 708	90%	9 009	10%	...	<1000	<1000	...	9%	29%			
Nauru	...	...	...	...	...	...	...	...	...	...	...	<1000	3 100	...	9%	29%			
Nepal	Dec.10 <sup>d</sup>	2 803	58%	2 051	42%	Dec.10	4 579	94%	288	6%	...	<100	<100	...	21%	86%			
Nicaragua	Dec.10	832	65%	454	35%	Dec.10	1 222	95%	64	5%	...	<100	<500	...	5%	8%			
Niger	Dec.10 <sup>d</sup>	3 166	43%	4 130	57%	Dec.10	7 477	96%	335	4%	...	4 300	6 500	...	6%	8%			
Nigeria	Dec.10	120 497	34%	238 684	66%	Dec.10	338 780	94%	20 401	6%	280 000	250 000	320 000	7%	6%	8%			
Niue	...	...	...	...	...	...	...	...	...	...	...	<1000	<1000	...	...	...			
Oman	Dec.08 <sup>e</sup>	262	64%	150	36%	Dec.10	460	98%	9	2%	...	<100	<100	...	18%	41%			
Pakistan	Dec.10	1 390	73%	502	27%	Dec.10	1 792	95%	100	5%	...	<1000	3 400	...	3%	11%			
Palau	Dec.10	1	33%	2	67%	Dec.10	3	100%	0	0%	...	<1000	<1000	...	...	...			
Panama	...	...	...	...	...	Dec.10	4 638	95%	250	5%	...	<1000	2 800	...	9%	31%			
Papua New Guinea	Dec.10	3 551	47%	4 004	53%	Dec.10	7 129	94%	426	6%	2 600	2 000	3 400	16%	12%	21%			
Paraguay	Nov.10 <sup>d</sup>	1 843	66%	942	34%	Nov.10	2 785	94%	177	6%	...	<100	<500	...	51%	>95%			
Peru	Dec.09	10 346	70%	4 434	30%	Dec.09	14 263	97%	517	3%	...	<1000	2 700	...	19%	72%			
Philippines	Dec.09 <sup>e</sup>	726	97%	24	3%	Dec.10	1 256	99%	18	1%	...	<200	<500	...	7%	15%			
Poland	Dec.10	3 591	73%	1 306	27%	Dec.10	4 767	97%	130	3%	...	<100	<100	...	>95%	>95%			
Republic of Moldova	Dec.10	697	56%	540	44%	Dec.10	1 196	97%	41	3%	...	<100	<200	...	28%	54%			
Romania	Dec.10	3 658	50%	3 618	50%	Dec.10	7 091	97%	185	3%	...	<500	<500	...	44%	70%			

Low- and middle-income countries <sup>a</sup>	Reported number of males and females receiving antiretroviral therapy				Reported number of adults and children receiving antiretroviral therapy				Estimated number of children needing antiretroviral therapy based on UNAIDS/WHO methods, 2010 <sup>b</sup>				Estimated antiretroviral therapy coverage among children, December 2010 <sup>c</sup>			
	Month and year of report	Males	% of total	Females	% of total	Month and year of report	Adults (+15)	% of total	Children (<15)	% of total	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate
Russian Federation	Dec. 10 <sup>d</sup>	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rwanda	Dec. 10 <sup>d</sup>	34 905	38%	55 763	62%	Dec. 10	84 443	92%	7 541	8%	17 000	14 000	21 000	45%	36%	53%
Saint Kitts and Nevis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Saint Lucia	Dec. 09	59	48%	65	52%	Dec. 09	121	98%	3	2%	...	...	...	...	...	...
Saint Vincent and the Grenadines	Dec. 09	87	54%	75	46%	Dec. 09	159	98%	3	2%	...	...	...	...	...	...
Samoa	Dec. 10	9	69%	4	31%	Dec. 10	9	69%	4	31%	...	...	...	...	...	...
Sao Tome and Principe	Dec. 10	76	39%	120	61%	Dec. 10	189	96%	7	4%	...	<100	<100	...	10%	18%
Senegal	Dec. 09	4 427	36%	7 822	64%	Dec. 09	11 455	94%	794	6%	...	2 400	5 000	...	16%	34%
Serbia	Dec. 10 <sup>d</sup>	677	75%	230	25%	Dec. 10	904	99%	11	1%	...	<100	<200	...	9%	21%
Seychelles	Dec. 10	92	59%	64	41%	Dec. 10	150	96%	6	4%	...	...	...	...	...	...
Sierra Leone	Dec. 10	1 805	33%	3 747	67%	Dec. 10	4 877	88%	675	12%	2 400	1 900	3 000	28%	23%	36%
Slovakia	Dec. 10	92	78%	26	22%	Dec. 10	118	100%	0	0%	...	<100	<100	...	0%	0%
Solomon Islands	Dec. 10 <sup>d</sup>	1	13%	7	88%	Dec. 10	7	100%	0	0%	...	...	...	...	...	...
Somalia	Dec. 10 <sup>d</sup>	378	45%	469	55%	Dec. 10 <sup>d</sup>	810	96%	34	4%	...	4 300	8 300	...	<1%	1%
South Africa	Sept. 10 <sup>de</sup>	316 637	35%	601 081	65%	Dec. 10	1 274 183	92%	108 682	8%	300 000	270 000	340 000	36%	32%	40%
Sri Lanka	Dec. 10	151	59%	105	41%	Dec. 10	242	95%	14	5%	...	<100	<100	...	17%	34%
Sudan	Dec. 10 <sup>d</sup>	1 284	61%	838	39%	Dec. 10	3 972	...	373	...	15 000	9 800	23 000	2%	2%	4%
Suriname	Dec. 10 <sup>d</sup>	532	49%	555	51%	Dec. 10	1 029	93%	77	7%	...	<200	<500	...	26%	68%
Swaziland	Dec. 10	21 689	36%	38 113	64%	Dec. 10	54 084	90%	5 718	10%	10 000	9 300	12 000	55%	48%	61%
Syrian Arab Republic	Feb. 11	78	69%	35	31%	Dec. 10	108	98%	2	2%	...	...	...	...	...	...
Tajikistan	Dec. 10	298	59%	206	41%	Dec. 10	483	96%	21	4%	...	<500	<500	...	5%	5%
Thailand	Sept. 10 <sup>d</sup>	104 273	50%	104 297	50%	Sept. 10	228 949	97%	7 859	3%	...	9 400	13 000	...	60%	84%
The former Yugoslav Republic of Macedonia	Dec. 10	29	81%	7	19%	Dec. 10	36	100%	0	0%	...	...	...	...	...	...
Timor-Leste	Dec. 10	16	41%	23	59%	Dec. 10	36	92%	3	8%	...	...	...	...	...	...
Togo	Dec. 10	8 399	34%	16 236	66%	Dec. 10	23 278	94%	1 357	6%	8 500	7 300	10 000	16%	13%	19%
Tonga	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Low- and middle-income countries <sup>a</sup>	Reported number of males and females receiving antiretroviral therapy				Reported number of adults and children receiving antiretroviral therapy				Estimated number of children needing antiretroviral therapy based on UNAIDS/WHO methods, 2010 <sup>b</sup>			Estimated antiretroviral therapy coverage among children, December 2010 <sup>c</sup>				
	Month and year of report	Males	% of total	Females	% of total	Month and year of report	Adults (+15)	% of total	Children (<15)	% of total	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate
Tunisia	Dec. 09	262	64%	150	36%	Dec. 10	392	95%	20	5%	...	<200	<1000	...	2%	14%
Turkey	...	...	...	...	...	...	...	...	...	...	...	<100	<100	...	...	...
Turkmenistan	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tuvalu	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Uganda	Sept. 10 <sup>d</sup>	85 587	37%	147 663	63%	Sept. 10	228 368	92%	19 854	8%	120 000	100 000	140 000	16%	14%	19%
Ukraine	Dec. 10	12 024	53%	10 673	47%	Dec. 10	20 651	91%	2 046	9%	...	2 800	4 200	...	48%	73%
United Republic of Tanzania	Dec. 10 <sup>d</sup>	89 796	35%	167 221	65%	Dec. 10	238 052	92%	20 017	8%	110 000	96 000	130 000	18%	16%	21%
Uruguay	...	...	...	...	...	Dec. 10	3 000	96%	124	4%	...	<200	<500	...	36%	>95%
Uzbekistan	Dec. 10 <sup>d</sup>	567	46%	666	54%	Dec. 10	1 233	50%	1 246	50%	...	<500	<500	...	>95%	>95%
Vanuatu	Dec. 10	0	0%	2	100%	Dec. 10	1	50%	1	50%	...	...	...	...	...	...
Venezuela (Bolivarian Republic of)	Dec. 10 <sup>d</sup>	30 261	81%	7 297	19%	Dec. 10	36 985	98%	842	2%	...	4 500	9 400	...	9%	19%
Viet Nam	Dec. 10	34 319	69%	15 173	31%	Dec. 10	46 824	95%	2 668	5%	...	3 400	5 000	...	53%	78%
Yemen	Dec. 10	330	62%	201	38%	Dec. 10	493	93%	38	7%	...	...	...	...	...	...
Zambia	Dec. 10	145 722	42%	198 685	58%	Dec. 10	319 019	93%	25 388	7%	98 000	86 000	110 000	26%	23%	30%
Zimbabwe	Dec. 10	118 476	36%	207 765	64%	Dec. 10	294 026	90%	32 215	10%	100 000	91 000	120 000	32%	28%	35%

... Data not available or not applicable.

a See the country classification by income, level of the epidemic and geographical, UNAIDS, UNICEF and WHO regions (Annex 10).

b The needs estimates are based on the methods described in the explanatory notes to the annexes. The estimates for individual countries may differ according to the local methods used.

c The coverage estimates are based on the estimated unrounded numbers of children receiving antiretroviral therapy and the estimated unrounded need for antiretroviral therapy (based on UNAIDS/WHO methodology). The ranges in coverage estimates are based on plausibility bounds in the denominator: that is, low and high estimates of need.

d The latest available breakdowns refer to partial data – for example, without private-sector data – or cumulative data sets and do not reflect national-level data. See Annex 4 for national-level data.

e The latest available breakdowns are not as recent as the latest reported national-level data. See Annex 4 for the latest reported national-level data.

f Estimates of the number of people needing antiretroviral therapy are currently being reviewed and will be adjusted, as appropriate, based on ongoing data collection and analysis. Some countries have therefore requested that only a range be published or no needs estimate at all.

g Although no report has been received from the Russian Federation, for the analysis throughout the report, based on previous reports, an estimated 4% of the people receiving antiretroviral therapy in the Russian Federation are assumed to be children.

**Annex 6 Preventing the mother-to-child transmission of HIV in low- and middle-income countries, 2009-2010**

Low- and middle-income countries	Number of pregnant women living with HIV who received antiretroviral medicine recommended by WHO for preventing mother-to-child transmission		Estimated number of pregnant women living with HIV needing antiretroviral medicine for preventing mother-to-child transmission based on UNAIDS/WHO methods <sup>a</sup>		Estimated percentage of pregnant women living with HIV who received antiretroviral medicine recommended by WHO for preventing mother-to-child transmission <sup>b</sup>		Pregnant women tested for HIV		Infants born to women living with HIV receiving antiretroviral medicine for preventing mother-to-child transmission		Infants born to women living with HIV receiving co-trimoxazole prophylaxis within two months of birth		Infants born to women living with HIV receiving a virological test by two months of age	
	Reported number <sup>c</sup>	Period	Estimate [range]	Estimate [range]	Reported number	Estimated coverage	Reported number	Estimated coverage [range]	Reported number	Estimated coverage [range]	Reported number	Estimated coverage [range]	Reported number	Estimated coverage [range]
Afghanistan	0 <sup>a</sup>	Jan. 10-Dec. 10	... [ $<100$ - $<500$ ]	... [0%]	...	...	...	...	...	...	...	...	...	...
Albania	0	Jan. 10-Dec. 10	...	...	...	...	...	...	...	...	...	...	...	...
Algeria	54 <sup>d</sup>	Jan. 10-Dec. 10	... [ $<200$ - $<500$ ]	... [14-33%]	...	...	...	...	...	...	...	...	...	...
Angola	3 125	Jan. 10-Dec. 10	16 000 [11 000-21 000]	20% [15-28%]	2 578	32%	2 578	17% [12-23%]	2 578	17% [12-23%]	2 578	17% [12-23%]	474 <sup>e</sup>	3% [2-4%]
Argentina	2 146	Jan. 10-Dec. 10	... [ $<1 000$ -2 200]	... [ $>95$ - $>95$ %]	670 802 <sup>h</sup>	$>95$ %	2 549	... [ $>95$ - $>95$ %]	2 549	... [ $>95$ - $>95$ %]	2 549	... [ $>95$ - $>95$ %]	...	...
Armenia	17	Jan. 10-Dec. 10	... [ $<100$ - $<100$ ]	... [21- $>95$ %]	41 638	88%	13	... [16- $>95$ %]	6	... [7- $>95$ %]	0	... [0%]	...	...
Azerbaijan	17	Jan. 10-Dec. 10	... [ $<100$ - $<100$ ]	... [22-46%]	187 097 <sup>h</sup>	$>95$ %	15	... [19-41%]	19	... [24-51%]	16	... [20-43%]	...	...
Bangladesh	15	Jan. 10-Dec. 10	... [ $<100$ - $<200$ ]	... [8-20%]	116 <sup>e</sup>	$<1$ %	3	... [2-4%]	3	... [2-4%]	3	... [2-4%]	...	...
Belarus	191 <sup>a</sup>	Jan. 10-Dec. 10	... [ $<100$ - $<500$ ]	... [86- $>95$ %]	115 082 <sup>h</sup>	$>95$ %	208	... [94- $>95$ %]	195	... [88- $>95$ %]	145	... [66- $>95$ %]	...	...
Belize	53	Jan. 10-Dec. 10	... [ $<100$ - $<200$ ]	... [35-62%]	6 178	8%	53	... [35-62%]	54	... [36-64%]	54	... [36-64%]	...	...
Benin	797 <sup>a</sup>	Jan. 10-Dec. 10	3 700 [3 100-4 500]	21% [18-26%]	149 871	43%	1 306	35% [29-42%]	1 473 <sup>f</sup>	40% [33-48%]	...	...	...	...
Bhutan	5	Jan. 10-Dec. 10	... [ $<100$ - $<100$ ]	... [17-42%]	5 922	40%	13 <sup>h</sup>	... [43- $>95$ %]	7 <sup>h</sup>	... [23-58%]	...	...	...	...
Bolivia (Plurinational State of)	145	Jan. 10-Dec. 10	... [ $<100$ - $<200$ ]	... [76- $>95$ %]	131 723	50%	151	... [79- $>95$ %]	27 <sup>h</sup>	... [14-84%]	151	... [79- $>95$ %]	...	...
Bosnia and Herzegovina	0	Jan. 10-Dec. 10	...	...	1 676	5%	0	...	0	...	0	...	...	...
Botswana	14 641	Jan. 10-Dec. 10	13 000 [12 000-15 000]	$>95$ % [ $>95$ - $>95$ %]	48 708 <sup>h</sup>	$>95$ %	14 582	$>95$ % [ $>95$ - $>95$ %]	10 094	78% [69-87%]	6 850 <sup>i</sup>	53% [47-59%]	...	...
Brazil	6 160	Jan. 10-Dec. 10	... [4 300-8 100]	... [76- $>95$ %]	2 381 280 <sup>h</sup>	79%	7 250	... [89- $>95$ %]	...	...	2 306 <sup>h</sup>	... [28-53%]	...	...
Bulgaria	9	Jan. 09-Dec. 09	... [ $<100$ - $<100$ ]	... [12-35%]	...	...	...	...	...	...	...	...	...	...
Burkina Faso	2 792	Jan. 10-Dec. 10	8 100 [6 600-9 900]	35% [28-42%]	382 523	54%	2 447	30% [25-37%]	2 296	29% [23-35%]	538	7% [5-8%]	...	...
Burundi	2 617	Jan. 10-Dec. 10	7 300 [5 400-8 200]	36% [32-49%]	110 988	39%	1 394	19% [17-26%]	1 394	19% [17-26%]	516	7% [6-10%]	...	...
Cambodia	670 <sup>a</sup>	Jan. 10-Dec. 10	... [1 700-3 900]	... [17-40%]	236 314	74%	912	... [24-55%]	113 <sup>d</sup>	... [3-7%]	717	... [19-43%]	...	...
Cameroon	15 720 <sup>a</sup>	Jan. 10-Dec. 10	30 000 [24 000-37 000]	53% [43-65%]	293 583	41%	7 980	27% [22-33%]	4 734	16% [13-20%]	6 376	21% [17-26%]	...	...
Cape Verde	61	Jan. 09-Dec. 09	... [ $<100$ - $<200$ ]	... [54- $>95$ %]	8 500 <sup>f</sup>	83%	67 <sup>f</sup>	86% [59- $>95$ %]	67 <sup>f</sup>	86% [59- $>95$ %]	67 <sup>f</sup>	86% [59- $>95$ %]	...	...
Central African Republic	2 013	Jan. 10-Dec. 10	8 600 [7 100-11 000]	24% [19-29%]	40 666	26%	1 074	13% [10-15%]	815	10% [8-12%]	40 <sup>f</sup>	$<1$ % [ $<1$ -1%]	...	...
Chad	1 000	Jan. 10-Dec. 10	14 000 [11 000-19 000]	7% [5-9%]	32 977	7%	655	5% [4-6%]	481	3% [3-4%]	235 <sup>d</sup>	2% [1-2%]	...	...
Chile	155	Jan. 10-Dec. 10	... [ $<200$ - $<500$ ]	... [38- $>95$ %]	112 647	46%	...	...	...	...	...	...	...	...

	Number of pregnant women living with HIV who received antiretroviral medicine preventing mother-to-child transmission		Estimated number of pregnant women living with HIV needing antiretroviral medicine for preventing mother-to-child transmission based on UNAIDS/WHO methods <sup>b</sup>		Estimated percentage of pregnant women living with HIV who received antiretroviral medicine recommended by WHO for preventing mother-to-child transmission <sup>c</sup>		Pregnant women tested for HIV		Infants born to women living with antiretroviral medicine for preventing mother-to-child transmission		Infants born to women living with HIV receiving co-trimoxazole prophylaxis within two months of birth		Infants born to women living with HIV receiving a virological test by two months of age	
	Reported number <sup>a</sup>	Period	Estimate [range]	Estimate [range]	Reported number	Estimated coverage	Reported number	Estimated coverage [range]	Reported number	Estimated coverage [range]	Reported number	Estimated coverage [range]	Reported number	Estimated coverage [range]
<b>Low- and middle-income countries</b>														
China	1873 <sup>a</sup>	Jan.10-Dec.10	... [3 900-8 900]	... [21-48%]	10 540 000 <sup>k</sup>	64%	2 192	... [25-57%]	...	...	...	...	...	...
Colombia	607 <sup>a</sup>	Jan.10-Dec.10	... [1 000-1 900]	... [32-80%]	452 098	49%	338	... [18-45%]	...	...	...	168	... [9-22%]	...
Comoros	2	Jan.10-Dec.10	... [<100-<100]	... [67->95%]	1 034 <sup>f</sup>	4%	1 <sup>f</sup>	... [33->95%]	1 <sup>f</sup>	... [33->95%]	0 <sup>f</sup>	...	... [0%]	...
Congo	616	Jan.10-Dec.10	3 800 [3 200-4 500]	16% [14-20%]	30 537	2%	347	9% [8-11%]	347	9% [8-11%]	377	10% [8-12%]	...	...
Cook Islands	...	Jan.10-Dec.10	...	...	...	...	...	...	...	...	...	...	...	...
Costa Rica	25	Jan.10-Dec.10	... [200-<500]	... [12-24%]	56 940	78%	30	... [15-29%]	35	... [17-34%]	35	... [17-34%]	...	...
Côte d'Ivoire	11 561 <sup>d</sup>	Jan.10-Dec.10	18 000 [15 000-21 000]	66% [54-79%]	395 128	59%	7 681	44% [36-52%]	3 866	22% [18-26%]	6 437 <sup>e</sup>	36% [30-44%]	...	...
Croatia	2	Jan.10-Dec.10	... [<100-<100]	... [15-40%]	...	...	0	... [0%]	...	...	...	...	...	...
Cuba	66	Jan.10-Dec.10	... [100-<100]	... [93->95%]	124 499 <sup>h</sup>	>95%	66	... [93->95%]	2	... [3-6%]	66	... [93->95%]	...	...
Democratic People's Republic of Korea	...	Jan.10-Dec.10	... [<100-<100]	...	...	...	...	...	...	...	...	...	...	...
Democratic Republic of the Congo	307 <sup>a</sup>	Jan.10-Dec.10	50 000 [41 000-61 000]	1% [1-1%]	326 856	11%	2 873	6% [5-7%]	396 <sup>f</sup>	1% [1-1%]	919	2% [1-2%]	...	...
Djibouti	38	Jan.10-Dec.10	<1 000 [500-<1 000]	6% [4-9%]	5 148	20%	36 <sup>h</sup>	6% [4-8%]	22 <sup>f</sup>	4% [2-5%]	...	...	...	...
Dominica	2	Jan.10-Dec.10	...	...	876	72%	1 <sup>f</sup>	...	2	...	1 <sup>f</sup>	...	...	...
Dominican Republic	822 <sup>a</sup>	Jan.10-Dec.10	... [1 000-1 900]	... [43-91%]	89 251	41%	935	... [49->95%]	132	... [7-15%]	132	... [7-15%]	...	...
Ecuador	509	Jan.10-Dec.10	... [1 000-<1 000]	... [83->95%]	274 573	92%	403	... [66->95%]	200	... [33->95%]	5 <sup>f</sup>	... [1-6%]	...	...
Egypt	7	Jan.10-Dec.10	... [100-<1 000]	... [1-10%]	...	...	7	... [1-10%]	0	... [0%]	7	... [1-10%]	...	...
El Salvador	94 <sup>a</sup>	Jan.10-Dec.10	... [500-1 300]	... [7-47%]	70 617	56%	102	... [8-50%]	0	... [0%]	108	... [8-53%]	...	...
Equatorial Guinea	133 <sup>a,d</sup>	Jan.10-Dec.10	2 300 [1 500-3 400]	6% [4-9%]	4 151 <sup>d</sup>	16%	174 <sup>d</sup>	7% [5-12%]	253	11% [7-17%]	...	...	...	...
Eritrea	42 <sup>a</sup>	Jan.10-Dec.10	1 200 [1 000-2 800]	3% [1-7%]	52 205	27%	452	36% [16-73%]	168 <sup>d</sup>	14% [6-27%]	...	...	...	...
Ethiopia	7 844	Jan.10-Dec.10	...	...	691 065	26%	4 737 <sup>g</sup>	...	13 000 <sup>m,n</sup>	...	13 000 <sup>en</sup>	...	...	...
Fiji	14 <sup>o</sup>	Jan.10-Dec.10	... [100-<100]	... [78->95%]	15 442 <sup>o</sup>	83%	27	... [95->95%]	25 <sup>o</sup>	... [95->95%]	27 <sup>o</sup>	... [95->95%]	...	...
Gabon	898 <sup>a</sup>	Jan.10-Dec.10	1 800 [1 300-2 700]	49% [34-72%]	22 662	55%	301 <sup>d</sup>	16% [11-24%]	333 <sup>d</sup>	18% [12-27%]	132	7% [5-11%]	...	...
Gambia	0 <sup>a</sup>	Jan.10-Dec.10	... [500-2 600]	... [0%]	32 048	49%	...	...	...	...	...	...	...	...
Georgia	33	Jan.10-Dec.10	... [100-<100]	... [49->95%]	45 246	87%	24	... [36->95%]	1	... [1-4%]	27	... [40->95%]	...	...
Ghana	5 845	Jan.10-Dec.10	12 000 [10 000-15 000]	48% [40-57%]	526 233	68%	2 316	19% [16-23%]	2 316	19% [16-23%]	130	1% [1-1%]	...	...
Grenada	1	Jan.10-Dec.10	...	...	2 056 <sup>h</sup>	>95%	1	...	1	...	0	...	...	...

	Number of pregnant women living with HIV who received antiretroviral medicine for preventing mother-to-child transmission		Estimated number of pregnant women living with HIV needing antiretroviral medicine for preventing mother-to-child transmission based on UNAIDS/WHO methods <sup>a</sup>		Estimated percentage of pregnant women living with HIV who received antiretroviral medicine recommended by WHO for preventing mother-to-child transmission <sup>c</sup>		Pregnant women tested for HIV		Infants born to women living with HIV receiving antiretroviral medicine for preventing mother-to-child transmission		Infants born to women living with HIV receiving co-trimoxazole prophylaxis within two months of birth		Infants born to women living with HIV receiving a virological test by two months of age	
	Reported number <sup>b</sup>	Period	Estimate [range]	Estimate [range]	Reported number	Estimated coverage	Reported number	Estimated coverage [range]	Reported number	Estimated coverage [range]	Reported number	Estimated coverage [range]	Reported number	Estimated coverage [range]
Guatemala	293	Jan.10-Dec.10	... [ <500-5 200]	... [6-87%]	98 233	21%	159 <sup>h</sup>	... [3-47%]	222 <sup>h</sup>	... [4-66%]	...	...	...	...
Guinea	1 074	Jan.10-Dec.10	4 700 [3 600-6 300]	23% [17-30%]	46 696	12%	526	11% [8-15%]	908	19% [15-25%]	292	6% [5-8%]	...	...
Guinea-Bissau	936 <sup>a</sup>	Jan.10-Dec.10	1 100 [ <1 000-1 400]	30% [25-38%]	25 455	44%	427	38% [30-47%]	35	3% [2-4%]	0	0% [0%]	...	...
Guyana	66 <sup>a</sup>	Jan.10-Dec.10	... [ <100-<200]	... [40-95%]	14 571 <sup>ah</sup>	>95%	188	... [ >95->95%]	103	... [62->95%]	52	... [31->95%]	...	...
Haiti	2 096 <sup>a</sup>	Jan.10-Dec.10	5 200 [4 300-6 200]	40% [34-49%]	137 044	51%	1 621	31% [26-38%]	...	...	1 103 <sup>a</sup>	21% [18-26%]	...	...
Honduras	320	Jan.10-Dec.10	... [ <500-<1 000]	... [54->95%]	125 920	62%	202	... [34-82%]	...	...	328	... [56->95%]	...	...
Hungary	5	Jan. 09-Dec. 09	... [ <100-<100]	... [3-33%]	8 357 <sup>h</sup>	8%	5 <sup>i</sup>	... [13-33%]	5 <sup>i</sup>	... [13-33%]	...	...	...	...
India	0 <sup>a</sup>	Jan.10-Dec.10	... [22 000-61 000]	...	6 239 085	23%	10 775	... [18-49%]	1 213	... [2-5%]	1 596	... [3-7%]	...	...
Indonesia	468	Jan.10-Dec.10	... [3 200-8 800]	... [5-15%]	13 140	<1%	250	... [3-8%]	...	...	...	...	...	...
Iran (Islamic Republic of)	58	Sep. 09-Sep. 10	... [ <500-<500]	... [13-23%]	...	...	55 <sup>r</sup>	... [13-22%]	49 <sup>r</sup>	... [11-20%]	55 <sup>r</sup>	... [13-22%]	...	...
Iraq	0	Jan.10-Dec.10	...	...	2 800	<1%	0	...	0	...	0	...	...	...
Jamaica	338 <sup>a,d</sup>	Jan.10-Dec.10	... [ <500-<1 000]	... [40-88%]	25 235 <sup>4e</sup>	50%	377 <sup>s</sup>	... [45->95%]	...	...	...	...	...	...
Jordan	3	Jan.10-Dec.10	...	...	3	<1%	1	...	0	...	1	...	...	...
Kazakhstan	149 <sup>a</sup>	Jan.10-Dec.10	... [ <100-<200]	... [86->95%]	430 550 <sup>e</sup>	>95%	227	... [ >95->95%]	227	... [ >95->95%]	227	... [ >95->95%]	...	...
Kenya	37 204 <sup>a</sup>	Jan.10-Dec.10	87 000 [75 000-100 000]	43% [37-49%]	1 265 447	83%	49 260	57% [49-65%]	5 935	7% [6-8%]	55 604	64% [56-74%]	...	...
Kiribati	1	Jan.10-Dec.10	...	...	1 714	84%	1	...	0	...	...	...	...	...
Kyrgyzstan	64	Jan.10-Dec.10	... [ <200-<1 000]	... [10-36%]	162 369 <sup>g</sup>	>95%	63	... [10-36%]	69	... [11-39%]	0 <sup>f</sup>	... [0%]	...	...
Lao People's Democratic Republic	27	Jan.10-Dec.10	... [ <200-<500]	... [7-15%]	2 892	2%	17	... [4-10%]	14	... [3-8%]	3	... [1-2%]	...	...
Latvia	45	Jan.10-Dec.10	... [ <100-<100]	... [45-92%]	...	...	...	...	26	... [26-53%]	26	... [26-53%]	...	...
Lebanon	...	Jan.10-Dec.10	... [ <100-<100]	...	...	...	...	...	...	...	...	...	...	...
Lesotho	12 370	Jan.10-Dec.10	14 000 [12 000-16 000]	89% [77-95%]	34 329	57%	10 670	76% [66-86%]	1 542 <sup>h</sup>	11% [10-12%]	10 907	78% [68-88%]	...	...
Liberia	588	Jan.10-Dec.10	1 500 [1 100-2 000]	38% [29-53%]	64 319	42%	354	23% [18-32%]	45 <sup>is</sup>	3% [2-4%]	109 <sup>is</sup>	7% [5-10%]	...	...
Libya	...	Jan.10-Dec.10	...	...	...	...	...	...	...	...	...	...	...	...
Lithuania	12	Jan. 09-Dec. 09	... [ <100-<100]	... [86->95%]	30 057 <sup>f</sup>	86%	12 <sup>f</sup>	... [86->95%]	...	...	10 <sup>f</sup>	... [71->95%]	...	...
Madagascar	17	Jan.10-Dec.10	... [1 300-2 800]	... [ <1-1%]	152 600	21%	3	... [ <1-<1%]	0	... [0%]	...	...	...	...
Malawi	17 729 <sup>a</sup>	Jan.10-Dec.10	... [57 000-76 000] <sup>1</sup>	... [23-31%]	437 856	66%	26 422	... [35-46%]	28 079 <sup>f</sup>	... [37-49%]	...	...	...	...

**Low- and middle-income countries**

	Number of pregnant women living with HIV who received antiretroviral medicine recommended by WHO for preventing mother-to-child transmission		Estimated number of pregnant women living with HIV needing antiretroviral medicine for preventing mother-to-child transmission based on UNAIDS/WHO methods <sup>b</sup>		Estimated percentage of pregnant women living with HIV who received antiretroviral medicine recommended by WHO for preventing mother-to-child transmission <sup>c</sup>		Pregnant women tested for HIV		Infants born to women living with HIV receiving antiretroviral medicine for preventing mother-to-child transmission		Infants born to women living with HIV receiving co-trimoxazole prophylaxis within two months of birth		Infants born to women living with HIV receiving a virological test by two months of age	
	Reported number <sup>a</sup>	Period	Estimate [range]	Estimate [range]	Reported number	Estimated coverage	Reported number	Estimated coverage [range]	Reported number	Estimated coverage [range]	Reported number	Estimated coverage [range]	Reported number	Estimated coverage [range]
<b>Low- and middle-income countries</b>														
Malaysia	282	Jan.10-Dec.10	... [ <1 000- <1 000 ]	... [29-53%]	443 570 <sup>1</sup>	77%	258	... [26-49%]	258	... [26-49%]	258	... [26-49%]	258	... [26-49%]
Maldives	0	Jan.10-Dec.10	... [ <100- <100 ]	... [0%]	5 833 <sup>4</sup>	>95%	0	... [0%]	0	... [0%]	0 <sup>1</sup>	... [0%]	0 <sup>1</sup>	... [0%]
Mali	1 277	Jan.10-Dec.10	... [3 700-7 600]	... [7-34%]	110 085	15%	1 002	... [13-27%]	3 913	... [52->95%]	...	... [52->95%]	...	...
Marshall Islands	0 <sup>a</sup>	Oct. 08-Sep. 09	...	...	...	...	...	...	...	...	...	...	...	...
Mauritania	72	Jan.10-Dec.10	... [ <1 000-1 700 ]	... [4-13%]	3 915	3%	34	... [2-6%]	34	... [2-6%]	...	... [2-6%]	...	...
Mauritius	64	Jan.10-Dec.10	... [ <100- <100 ]	... [77->95%]	14 348	86%	39	... [47-89%]	39	... [47-89%]	...	... [47-89%]	...	...
Mexico	124	Jan. 09-Dec. 09	... [ <500-1 300 ]	... [9-31%]	757 863 <sup>h</sup>	34%	58 <sup>h</sup>	... [4-15%]	...	...	...	...	...	...
Micronesia (Federated States of)	0 <sup>a</sup>	Jan.10-Dec.10	...	...	...	...	...	...	...	...	...	...	...	...
Mongolia	1	Jan.10-Dec.10	... [ <100- <100 ]	... [7-17%]	64 073 <sup>h</sup>	>95%	0	... [0%]	0	... [0%]	0	... [0%]	0	... [0%]
Montenegro	...	Jan.10-Dec.10	...	...	...	...	...	...	...	...	...	...	...	...
Morocco	124	Jan.10-Dec.10	... [ <500- <1 000 ]	... [15-39%]	3 057 <sup>4s</sup>	<1%	62	... [7-20%]	62	... [7-20%]	62	... [7-20%]	56	... [7-18%]
Mozambique	52 222 <sup>a</sup>	Jan.10-Dec.10	100 000 [85 000-120 000]	52% [44-62%]	766 025	87%	42 162	42% [36-50%]	...	...	...	...	34 593	34% [29-41%]
Myanmar	2 500	Jan.10-Dec.10	... [2 400-5 100]	... [49->95%]	290 914	35%	1 979	... [39-89%]	1 158	... [23-47%]	64	... [1-3%]	...	... [1-3%]
Namibia	7 790 <sup>a</sup>	Jan.10-Dec.10	8 000 [6 000-9 900]	>95% [79->95%]	51 655	86%	8 451	>95% [86->95%]	...	...	4 962	62% [50-83%]	...	62% [50-83%]
Nauru	...	Jan.10-Dec.10	...	...	...	...	...	...	...	...	...	...	...	...
Nepal	53 <sup>a</sup>	Jan.10-Dec.10	... [ <500-1 400 ]	... [4-14%]	94 511	13%	122	... [8-33%]	79	... [5-21%]	17	... [1-5%]	...	... [1-5%]
Nicaragua	90	Jan.10-Dec.10	... [ <100- <500 ]	... [29->95%]	89 712	65%	87	... [28->95%]	81	... [26->95%]	58	... [18->95%]	...	... [18->95%]
Niger	2 119	Jan.10-Dec.10	... [3 400-5 000]	... [42-62%]	304 303	40%	523	... [10-15%]	480	... [10-14%]	...	...	...	...
Nigeria	19 628 <sup>a</sup>	Jan.10-Dec.10	230 000 [200 000-260 000]	9% [7-10%]	907 387	14%	24 156	11% [9-12%]	5 293 <sup>d</sup>	2% [2-3%]	8 834	4% [3-4%]	...	4% [3-4%]
Niue	... <sup>a</sup>	Jan.10-Dec.10	...	...	...	...	...	...	...	...	...	...	...	...
Oman	25	Jan.10-Dec.10	... [ <100- <100 ]	... [49->95%]	67 110 <sup>h</sup>	>95%	26	... [51->95%]	4 <sup>1</sup>	... [8-19%]	4 <sup>1</sup>	... [8-19%]	...	... [8-19%]
Pakistan	23	Jan.10-Dec.10	... [ <1 000-4 200 ]	... [1-2%]	3 573	<1%	20	... [ <1-2% ]	0	... [0%]	20	... [ <1-2% ]	...	... [ <1-2% ]
Palau	0	Jan.10-Dec.10	...	...	...	...	...	...	...	...	...	...	...	...
Panama	118	Jan. 09-Dec. 09	... [ <200- <1 000 ]	... [20-80%]	59 334 <sup>1</sup>	85%	151	... [25->95%]	98 <sup>d</sup>	... [16-66%]	93 <sup>d</sup>	... [16-63%]	...	... [16-63%]
Papua New Guinea	225	Jan.10-Dec.10	1 400 [1 000-1 700]	16% [13-22%]	50 265	24%	384	28% [22-37%]	19 <sup>1</sup>	1% [1-2%]	...	1% [1-2%]	...	...



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	Reported number <sup>c</sup>	Period	Estimate [range]	Estimate [range]	Reported number	Estimated coverage	Reported number	Estimated coverage [range]	Reported number	Estimated coverage [range]	Reported number	Estimated coverage [range]	Reported number	Estimated coverage [range]
Paraguay	149	Jan. 10-Dec. 10	... [ $<200$ - $<1000$ ]	... [ $25$ - $95\%$ ]	72 497	46%	165	... [ $28$ - $95\%$ ]	125	... [ $21$ - $95\%$ ]	82	... [ $14$ - $67\%$ ]	...	...
Peru	539	Jan. 10-Dec. 10	... [ $<500$ - $2700$ ]	... [ $20$ - $95\%$ ]	462 081 <sup>o</sup>	78%	466	... [ $17$ - $95\%$ ]	...	...	...	...	...	...
Philippines	12	Jan. 10-Dec. 10	... [ $<200$ - $<500$ ]	... [ $3$ - $8\%$ ]	...	...	7	... [ $1$ - $5\%$ ]	7	... [ $1$ - $5\%$ ]	7	... [ $1$ - $5\%$ ]	...	...
Poland	67	Jan. 10-Dec. 10	... [ $<200$ - $<500$ ]	... [ $23$ - $48\%$ ]	...	...	54	... [ $18$ - $39\%$ ]	69 <sup>f</sup>	... [ $23$ - $49\%$ ]	54	... [ $18$ - $39\%$ ]	...	...
Republic of Moldova	123	Jan. 10-Dec. 10	... [ $<200$ - $<500$ ]	... [ $53$ - $87\%$ ]	45 140 <sup>#</sup>	>95%	134	... [ $58$ - $95\%$ ]	34	... [ $15$ - $24\%$ ]	137	... [ $60$ - $95\%$ ]	...	...
Romania	191	Jan. 10-Dec. 10	... [ $<100$ - $<200$ ]	... [ $95$ - $95\%$ ]	111 584	51%	173	... [ $95$ - $95\%$ ]	7 <sup>f</sup>	... [ $4$ - $11\%$ ]	192 <sup>f</sup>	... [ $95$ - $95\%$ ]	...	...
Russian Federation	8 928 <sup>a</sup>	Jan. 10-Dec. 10	... [ $11000$ - $16000$ ]	... [ $57$ - $84\%$ ]	1 468 091 <sup>lv</sup>	87%	8 744 <sup>h</sup>	... [ $55$ - $83\%$ ]	...	...	...	...	...	...
Rwanda	7 293 <sup>a</sup>	Jan. 10-Dec. 10	12 000 [ $9800$ - $15000$ ]	60% [ $50$ - $75\%$ ]	297 145	68%	7 610	63% [ $52$ - $78\%$ ]	7 368	61% [ $50$ - $75\%$ ]	7 220	60% [ $49$ - $74\%$ ]	...	...
Saint Kitts and Nevis	0 <sup>a</sup>	Jan. 09-Dec. 09	...	...	...	...	...	...	...	...	...	...	...	...
Saint Lucia	6	Jan. 09-Dec. 09	...	...	...	...	...	...	...	...	...	...	...	...
Saint Vincent and the Grenadines	10 <sup>a</sup>	Jan. 09-Dec. 09	...	...	2 635 <sup>ll</sup>	>95%	15 <sup>f</sup>	...	14 <sup>f</sup>	...	14 <sup>f</sup>	...	...	...
Samoa	0	Jan. 10-Dec. 10	...	...	...	...	...	...	...	...	...	...	...	...
Sao Tome and Principe	33	Jan. 10-Dec. 10	... [ $<100$ - $<100$ ]	... [ $69$ - $95\%$ ]	5 898 <sup>ll</sup>	>95%	27	... [ $56$ - $95\%$ ]	27	... [ $56$ - $95\%$ ]	...	...	...	...
Senegal	917	Jan. 09-Dec. 09	... [ $2200$ - $4700$ ]	... [ $20$ - $42\%$ ]	166 830 <sup>f</sup>	36%	433 <sup>f</sup>	... [ $9$ - $20\%$ ]	...	...	339 <sup>f</sup>	... [ $7$ - $15\%$ ]	...	...
Serbia	2	Jan. 10-Dec. 10	... [ $<100$ - $<100$ ]	... [ $2$ - $7\%$ ]	6 313	6%	3	... [ $3$ - $10\%$ ]	0	... [ $0\%$ ]	3	... [ $3$ - $10\%$ ]	...	...
Seychelles	10	Jan. 10-Dec. 10	...	...	1543 <sup>ll</sup>	>95%	6	...	6	...	6	...	...	...
Sierra Leone	1 805	Jan. 10-Dec. 10	2 900 [ $2300$ - $3600$ ]	62% [ $51$ - $77\%$ ]	112 338	50%	518 <sup>h</sup>	18% [ $15$ - $22\%$ ]	521	18% [ $15$ - $22\%$ ]	...	...	...	...
Slovakia	0	Jan. 10-Dec. 10	... [ $<100$ - $<100$ ]	... [ $0\%$ ]	59 900 <sup>ll</sup>	>95%	0	... [ $0\%$ ]	0	... [ $0\%$ ]	0	... [ $0\%$ ]	...	...
Solomon Islands	0	Jan. 10-Dec. 10	...	...	997 <sup>d</sup>	6%	...	...	...	...	...	...	...	...
Somalia	3 <sup>a</sup>	Jan. 10-Dec. 10	... [ $2600$ - $6000$ ]	... [ $<1\%$ ]	5 995	1%	21	... [ $<1$ - $1\%$ ]	0 <sup>f</sup>	... [ $0\%$ ]	...	...	...	...
South Africa	250 072	Jan. 10-Dec. 10	260 000 [ $230000$ - $290000$ ]	>95% [ $85$ - $95\%$ ]	1 142 983 <sup>ll</sup>	>95%	178 208	68% [ $61$ - $77\%$ ]	141 483	54% [ $48$ - $61\%$ ]	178 672	69% [ $61$ - $77\%$ ]	...	...
Sri Lanka	2	Jan. 10-Dec. 10	... [ $<100$ - $<100$ ]	... [ $3$ - $6\%$ ]	13 479	4%	3	... [ $4$ - $9\%$ ]	4	... [ $5$ - $13\%$ ]	0	... [ $0\%$ ]	...	...
Sudan	279 <sup>aw</sup>	Jan. 10-Dec. 10	12 000 [ $7800$ - $19000$ ]	2% [ $1$ - $4\%$ ]	56 469 <sup>*</sup>	4%	70 <sup>f</sup>	1% [ $<1$ - $1\%$ ]	25 <sup>z</sup>	<1% [ $<1$ - $1\%$ ]	...	...	...	...
Suriname	84	Jan. 09-Dec. 09	... [ $<100$ - $<500$ ]	... [ $19$ - $95\%$ ]	8 511 <sup>f</sup>	88%	73 <sup>f</sup>	... [ $16$ - $95\%$ ]	...	...	9 <sup>f</sup>	... [ $2$ - $15\%$ ]	...	...
Swaziland	9 273	Jan. 10-Dec. 10	9 100 [ $8100$ - $10000$ ]	>95% [ $88$ - $95\%$ ]	29 046	83%	8 997	>95% [ $86$ - $95\%$ ]	8 087	89% [ $77$ - $95\%$ ]	4 902	54% [ $47$ - $61\%$ ]	...	...
Syrian Arab Republic	0	Jan. 10-Dec. 10	...	...	0	0%	0	...	0	...	0	...	...	...

	Number of pregnant women living with HIV who received antiretroviral medicine recommended by WHO for preventing mother-to-child transmission		Estimated number of pregnant women living with HIV needing antiretroviral medicine for preventing mother-to-child transmission based on UNAIDS/WHO methods <sup>b</sup>		Estimated percentage of pregnant women living with HIV who received antiretroviral medicine recommended by WHO for preventing mother-to-child transmission <sup>c</sup>		Pregnant women tested for HIV		Infants born to women living with antiretroviral medicine for preventing mother-to-child transmission		Infants born to women living with HIV receiving co-trimoxazole prophylaxis within two months of birth		Infants born to women living with HIV receiving a virological test by two months of age	
	Reported number <sup>a</sup>	Period	Estimate [range]	Estimate [range]	Estimate [range]	Reported number	Estimated coverage	Reported number	Estimated coverage [range]	Reported number	Estimated coverage [range]	Reported number	Estimated coverage [range]	Reported number
Tajikistan	59	Jan.10-Dec.10	... [ $<200-1\,000$ ]	... [7-38%]	119 033	62%	48	... [6-31%]	57	... [7-37%]	...	...	...	...
Thailand	4 664	Oct. 09-Sep. 10	... [4 800-8 000]	... [59-95%]	787 337 <sup>k</sup>	94%	4 902 <sup>l</sup>	... [62-95%]	2 074 <sup>l</sup>	... [26-44%]	3 736 <sup>k</sup>	... [47-79%]	...	...
The former Yugoslav Republic of Macedonia	0	Jan.10-Dec.10	...	...	515	2%	...	...	...	...	...	...	...	...
Timor-Leste	3	Jan.10-Dec.10	...	...	71 <sup>h</sup>	<1%	1 <sup>h</sup>	...	...	...	...	...	...	...
Togo	3 126	Jan.10-Dec.10	6 200 [5 200-7 300]	51% [43-60%]	80 434	42%	2 178	35% [30-41%]	1 524	25% [21-29%]	1 162	19% [16-22%]	...	...
Tonga	0	Jan.10-Dec.10	...	...	0	0%	0	...	0	...	0	...	...	...
Tunisia	7	Jan.10-Dec.10	... [ $<100-1\,000$ ]	... [1-11%]	...	...	6	... [1-10%]	6	... [1-10%]	0	... [0%]	...	...
Turkey	0	Jan.10-Dec.10	... [ $<100-200$ ]	... [0%]	...	...	...	...	...	...	...	...	...	...
Turkmenistan	0	Jan.10-Dec.10	...	...	...	...	...	...	...	...	...	...	...	...
Tuvalu	...	Jan.10-Dec.10	...	...	...	...	...	...	...	...	...	...	...	...
Uganda	39 566 <sup>a</sup>	Jul. 09-Jun. 10	94 000 [77 000-110 000]	42% [36-51%]	951 466 <sup>ab</sup>	63%	20 625 <sup>abbb</sup>	22% [19-27%]	3 983 <sup>bccc</sup>	4% [4-5%]	10 000 <sup>bb</sup>	11% [9-13%]	...	...
Ukraine	4 564 <sup>a</sup>	Jan.10-Dec.10	... [2 400-4 400]	... [95-95%]	571 985 <sup>ff</sup>	>95%	3 745	... [85-95%]	2 953	... [67-95%]	2 690	... [61-95%]	...	...
United Republic of Tanzania	58 161 <sup>ai,df</sup>	Jan.10-Dec.10	98 000 [85 000-110 000]	59% [52-68%]	1 600 070 <sup>ee</sup>	86%	66 144 <sup>ff</sup>	68% [59-77%]	15 300 <sup>gg</sup>	16% [14-18%]	22 033 <sup>hh</sup>	22% [20-26%]	...	...
Uruguay	72	Jan.10-Dec.10	... [ $<100-500$ ]	... [23-95%]	35 953 <sup>i</sup>	72%	72 <sup>i</sup>	... [23-95%]	...	...	72 <sup>i</sup>	... [23-95%]	...	...
Uzbekistan	180 <sup>a</sup>	Jan. 09-Dec. 09	... [ $<100-1\,900$ ]	... [9-95%]	518 174	88%	527	... [28-95%]	...	...	43	... [2-95%]	...	...
Vanuatu	0	Jan.10-Dec.10	...	...	1 499 <sup>jj</sup>	21%	0 <sup>h</sup>	...	...	...	...	...	...	...
Venezuela (Bolivarian Republic of)	268	Jan.10-Dec.10	... [2 200-4 600]	... [6-12%]	...	...	274 <sup>l</sup>	... [6-12%]	...	...	...	...	...	...
Viet Nam	1 319 <sup>a</sup>	Jan.10-Dec.10	... [2 900-5 000]	... [26-46%]	760 726	52%	1 730	... [34-60%]	1 684 <sup>kk</sup>	... [33-58%]	...	...	...	...
Yemen	17	Jan.10-Dec.10	...	...	6 328	1%	17	...	14	...	9	...	...	...
Zambia	59 602 <sup>a</sup>	Jan.10-Dec.10	79 000 [70 000-88 000]	75% [67-85%]	566 057	94%	44 897	57% [51-64%]	31 346	40% [35-45%]	16 807	21% [19-24%]	...	...
Zimbabwe	21 044 <sup>a</sup>	Jan.10-Dec.10	46 000 [41 000-53 000]	46% [40-52%]	337 537	90%	35 256	77% [67-87%]	24 996	54% [47-62%]	6 500 <sup>d</sup>	14% [12-16%]	...	...

**Low- and middle-income countries**

- ... Data not available or not applicable.
- a As only the most effective regimens as recommended by WHO are reported here, the value for single-dose nevirapine value has been excluded from the total. In case the country also reported a number of women receiving an unspecified antiretroviral medicine, this has proportionally increased the value for single-dose nevirapine deducted from the reported total.
- b The coverage estimates are based on the methods described in the explanatory notes to the annexes and in Box 5.7. The estimates for individual countries may differ according to the local methods used.
- c The needs estimates are based on the numbers of pregnant women living with HIV receiving antiretroviral medicine (excluding single dose nevirapine) and the estimated unrounded need for antiretroviral medicine (based on UNAIDS/WHO methods). The ranges in coverage estimates are based on plausibility bounds in the denominator: that is, low and high estimates of need. Point estimates and ranges are given for countries with a generalized epidemic, whereas only ranges are given for countries with a low-level or concentrated epidemic.
- d The data are underreported, incomplete or are not representative of the population.
- e The data include infants older than two months of age.
- f The latest reported data are as of December 2009.
- g The data may be underreported.
- h The latest reported data are as of December 2008.
- i The data may include double counting.
- j An estimated 12 490 infants are reported to have been tested; however, only 6850 had reported results. The data did not specify when the test was done, so many infants may have been tested after two months of age.
- k The data are reported for the period October 2009 – September 2010.
- l The estimates of the number of pregnant women living with HIV needing antiretroviral medicine for preventing mother-to-child transmission are currently being reviewed and will be adjusted, as appropriate, based on ongoing data collection and analysis. Some countries have therefore requested that only a range be published or no needs estimates at all.
- m As these data are not fully captured at the national level, the data for infants born to women living with HIV receiving a virological test by two months of age have been used as a proxy for infants receiving co-trimoxazole prophylaxis within two months of birth.
- n The data are reported for the period July 2009 – June 2010.
- o Data were collected from CWM Hospital, Laitoka Hospital and Labasa Hospital.
- p Of the women with unknown HIV status who attended postpartum services, not all women were tested and received their results within 72 hours of delivery.
- q The data are reported for the period June 2010 – December 2010.
- r The data are reported for the period September 2009 – September 2010.
- s Data are not available from the private sector and/or semi-public sector.
- t Only includes data from government health facilities.
- u Data are only from Ministerio de Salud (MINSAL) and do not include other subsectors of the health sector.
- v The Russian Federation reported 4 827 215 pregnant women being tested for HIV. As the number of pregnant women tested likely reflects double or triple counting, 95% of the estimated number of births in the Russian Federation (1 545 359) was used as a proxy and most likely represents the total number of tests conducted among pregnant women.
- w Two separate reports were received from Sudan: Southern Sudan reported 559 in 2010; Northern Sudan reported 110 for the reporting period from January to December 2010, giving a total of 669. Adjusted value (see footnote a).
- x Two separate reports were received from Sudan: Southern Sudan reported 31 718 in 2010; Northern Sudan reported 24 751 for the reporting period from January to December 2010, giving a total of 56 469.
- y Two separate reports were received from Sudan: Southern Sudan reported 70 in 2010; Northern Sudan reported no data for 2010.
- z Two separate reports were received from Sudan: Southern Sudan reported 25 in 2010; Northern Sudan reported no data in 2010.
- aa The programme was out of stock of antiretroviral medicine for prophylaxis for six months.
- bb The data are reported for the period July 2009 – June 2010.
- cc The data are only from a few facilities, since data tools were only recently adjusted to collect data for this indicator.
- dd Two separate reports were received from the United Republic of Tanzania: Tanzania Mainland reported 80 748 to December 2010; Zanzibar reported 310 for the reporting period from January to December 2010, giving a total of 81 058. Adjusted value (see footnote a).
- ee Two separate reports were received from the United Republic of Tanzania: Tanzania Mainland reported 1557 859 to December 2010; Zanzibar reported 42 211 for the reporting period from January to December 2010, giving a total of 1 600 070.
- ff Two separate reports were received from the United Republic of Tanzania: Tanzania Mainland reported 65 948 to December 2010; Zanzibar reported 196 for the reporting period from January to December 2010, giving a total of 66 144.
- gg Two separate reports were received from the United Republic of Tanzania: Tanzania Mainland reported 15 300 to December 2010; Zanzibar reported that data are not available for the reporting period from January to December 2010.
- hh The current monitoring tools do not disaggregate for age.
- ii Two separate reports were received from the United Republic of Tanzania: Tanzania Mainland reported 22 033 to December 2010; Zanzibar reported that data are not available for the reporting period from January to December 2010.
- jj The data were collected from Northern District Hospital, Wila Central Hospital, Leneakei Hospital, Lolowai Hospital and Norsup Hospital.
- kk The data are reported for the period November 2009 – September 2010.
- ll The reported number of pregnant women tested for HIV was higher than the estimated number of pregnant women, implying coverage exceeding 100%. Last year, coverage already exceeded 95% in these countries. Thus, in the regional and global analysis, the data have been adjusted to represent the same coverage as last year.

**Annex 7 Progress in 22 priority countries on key indicators for the Global Plan for eliminating mother-to-child transmission**

Countries	Number of women living with HIV delivering		Overall target New child infections due to mother-to-child transmission		Overall target HIV-associated deaths to women during pregnancy, delivery and puerperium		Prong 1 target HIV incidence in women 15-49 years old (%)		Prong 2 target Percentage of women 15-49 with unmet need for family planning	
	2009	2010	2009	2010	2008	2010	2009	2010	2009	Year
	Angola	15 000 [11 000-20 000]	16 000 [11 000-21 000]	5 200 [3 600-7 200]	5 200 [3 500-7 100]	330	...	0.25% [0.17-0.36%]	0.24% [0.15-0.34%]	...
Botswana	13 000 [12 000-15 000]	13 000 [12 000-15 000]	<1 000 [<500-1 100]	<500 [<500-1 000]	140	...	1.46% [1.22-1.78%]	1.31% [1.09-1.59%]	...	
Burundi	7 500 [5 900-8 400]	7 300 [5 400-8 200]	2 500 [1 800-2 800]	2 000 [1 400-2 400]	240	...	0.21% [0.08-0.22%]	0.19% [0.08-0.21%]	29.0%	2002
Cameroon	30 000 [25 000-37 000]	30 000 [24 000-37 000]	8 800 [6 900-11 000]	6 800 [4 900-9 200]	1 200	...	0.45% [0.34-0.68%]	0.43% [0.32-0.61%]	20.2%	2004
Chad	14 000 [11 000-18 000]	14 000 [11 000-19 000]	4 800 [3 700-6 200]	4 700 [3 500-6 200]	530	...	0.32% [0.21-0.54%]	0.30% [0.19-0.52%]	20.7%	2004
Côte d'Ivoire	19 000 [16 000-23 000]	18 000 [15 000-21 000]	5 600 [4 400-7 100]	4 800 [3 700-6 200]	1 000	...	0.20% [0.15-0.27%]	0.19% [0.15-0.25%]	...	
Democratic Republic of the Congo	50 000 [41 000-61 000]	50 000 [41 000-61 000]	19 000 [15 000-23 000]	18 000 [15 000-23 000]	990	...	0.23% [0.15-0.34%]	0.23% [0.15-0.34%]	24.4%	2007
Ethiopia	...	...	...	...	1 800	...	...	...	33.8%	2005
Ghana	13 000 [11 000-15 000]	12 000 [10 000-15 000]	4 200 [3 500-5 100]	3 700 [3 000-4 600]	500	...	0.12% [0.09-0.15%]	0.11% [0.08-0.15%]	35.3%	2008
India	...	...	...	...	2 500	...	...	...	12.8%	2006
Kenya	87 000 [75 000-100 000]	87 000 [75 000-100 000]	23 000 [18 000-27 000]	19 000 [15 000-23 000]	2 200	...	0.67% [0.58-0.79%]	0.62% [0.53-0.75%]	25.6%	2009
Lesotho	14 000 [12 000-16 000]	14 000 [12 000-16 000]	3 900 [3 400-4 600]	3 700 [3 100-4 400]	370	...	3.15% [2.68-3.79%]	2.80% [2.41-3.42%]	31.0%	2005
Malawi	...	...	...	...	1 900	...	...	...	27.6%	2004
Mozambique	99 000 [84 000-120 000]	100 000 [85 000-120 000]	30 000 [24 000-36 000]	32 000 [26 000-38 000]	2 500	...	1.33% [1.10-1.54%]	1.28% [1.06-1.50%]	18.4%	2004
Namibia	8 200 [6 100-10 000]	8 000 [6 000-9 900]	1 500 [1 000-2 100]	1 100 [<1 000-1 600]	100	...	0.98% [0.58-1.52%]	0.94% [0.55-1.48%]	20.6%	2007
Nigeria	220 000 [190 000-250 000]	230 000 [200 000-260 000]	72 000 [63 000-84 000]	75 000 [65 000-86 000]	4 900	...	0.53% [0.44-0.61%]	0.53% [0.43-0.62%]	20.2%	2008
South Africa	270 000 [240 000-300 000]	260 000 [230 000-290 000]	61 000 [52 000-72 000]	48 000 [42 000-58 000]	3 800	...	1.77% [1.64-1.96%]	1.70% [1.58-1.88%]	13.8%	2004
Swaziland	9 300 [8 300-11 000]	9 100 [8 100-10 000]	1 700 [1 400-2 200]	1 300 [1 100-1 700]	230	...	3.29% [2.77-4.00%]	3.13% [2.59-3.81%]	24.0%	2007
Uganda	89 000 [75 000-110 000]	94 000 [77 000-110 000]	28 000 [22 000-33 000]	28 000 [22 000-34 000]	3 000	...	0.97% [0.70-1.26%]	0.88% [0.64-1.12%]	40.6%	2006
United Republic of Tanzania	97 000 [85 000-110 000]	98 000 [85 000-110 000]	29 000 [24 000-34 000]	24 000 [20 000-29 000]	3 100	...	0.70% [0.62-0.78%]	0.68% [0.59-0.76%]	21.8%	2005
Zambia	79 000 [70 000-87 000]	79 000 [70 000-88 000]	20 000 [17 000-23 000]	16 000 [13 000-19 000]	1 900	...	1.07% [0.80-1.30%]	0.97% [0.71-1.19%]	26.5%	2007
Zimbabwe	49 000 [43 000-56 000]	46 000 [41 000-53 000]	15 000 [12 000-17 000]	11 000 [9 500-14 000]	3 200	...	1.27% [0.95-1.64%]	1.12% [0.83-1.46%]	12.8%	2006

Sources:

Spectrum

Spectrum

Trends in Maternal Mortality 1990 to 2008. Estimates developed by WHO, UNICEF, UNFPA, and The World Bank

Spectrum

UNStats MDG database

... Data not available or not applicable.

 a Distribution of HIV-related deaths based on 2008 estimates (published in World health statistics 2011); envelope of deaths among children younger than five years, 2010 estimates (published by the United Nations Inter-agency Group for Child Mortality Estimation in 2011: <http://www.childmortality.org>).

b At the request of the country, no value can be presented, or only a range, as the estimates are currently being reviewed and will be adjusted, as appropriate, based on ongoing data collection and analysis.

Countries	Prong 3 target 3.1		Prong 3 target 3.2	Prong 3 target 3.3	Prong 4 target		Child target			
	Mother-to-child transmission rate (%)		Coverage of maternal antiretroviral medicine (prophylaxis and therapy) (%)	Percentage of infants born to HIV-infected women provided with antiretrovirals (either mother of infant) to reduce the risk of HIV transmission during the breastfeeding period	Percentage of eligible pregnant women provided with antiretroviral therapy		Percentage of under-five deaths due to HIV <sup>a</sup>		Coverage of antiretroviral therapy among children younger than 15 years old (%)	
	2009	2010	Coverage excluding single-dose nevirapine 2010	2009/2010	2009	2010	2009	2010	2009	2010
Angola	34% [18-64%]	33% [17-63%]	20% [15-28%]	...	...	...	1.9%	...	11% [8-14%]	10% [7-14%]
Botswana	5% [3-9%]	3% [2-6%]	>95% [>95->95%]	...	...	67% [63-71%]	16.6%	...	87% [77->95%]	88% [79->95%]
Burundi	33% [22-48%]	28% [17-44%]	36% [32-49%]	...	...	...	5.5%	...	13% [12-16%]	13% [11-16%]
Cameroon	29% [19-44%]	23% [13-38%]	53% [43-65%]	...	...	21% [19-23%]	5.0%	...	10% [9-12%]	11% [9-13%]
Chad	34% [21-56%]	33% [19-57%]	7% [5-9%]	...	...	9% [7-12%]	2.7%	...	5% [4-6%]	5% [4-6%]
Côte d'Ivoire	30% [19-44%]	27% [17-42%]	66% [54-79%]	...	...	27% [23-32%]	4.4%	...	14% [12-17%]	12% [11-15%]
Democratic Republic of the Congo	37% [25-56%]	37% [25-56%]	1% [<1-1%]	...	...	...	1.1%	...	7% [7-8%]	8% [8-8%]
Ethiopia	...	...	...	...	...	...	2.1%	...	...	...
Ghana	33% [23-48%]	30% [20-44%]	48% [40-57%]	...	...	...	4.1%	...	10% [8-12%]	13% [11-16%]
India	...	...	...	...	...	...	0.5%	...	...	...
Kenya	26% [19-36%]	21% [15-31%]	43% [37-49%]	...	...	47% [43-51%]	8.9%	...	18% [16-21%]	21% [18-25%]
Lesotho	28% [21-37%]	26% [19-35%]	89% [77->95%]	...	...	47% [43-51%]	30.7%	...	19% [17-22%]	22% [20-25%]
Malawi	...	...	...	...	...	...	13.3%	...	...	...
Mozambique	29% [20-43%]	31% [22-44%]	52% [44-62%]	...	...	17% [15-20%]	10.5%	...	11% [10-14%]	19% [16-23%]
Namibia	18% [10-34%]	14% [8-27%]	>95% [85->95%]	...	...	54% [46-62%]	19.5%	...	85% [70->95%]	87% [74->95%]
Nigeria	33% [25-43%]	33% [25-43%]	9% [7-10%]	...	...	8% [7-9%]	4.1%	...	8% [7-10%]	7% [6-8%]
South Africa	23% [18-31%]	18% [14-25%]	>95% [85->95%]	...	...	>95% [84->95%]	34.8%	...	36% [32-40%]	36% [32-40%]
Swaziland	19% [13-26%]	14% [11-21%]	>95% [88->95%]	...	...	53% [50-56%]	29.5%	...	56% [49-63%]	55% [48-61%]
Uganda	31% [21-44%]	30% [20-44%]	42% [36-51%]	...	...	32% [27-37%]	6.2%	...	14% [12-16%]	16% [14-19%]
United Republic of Tanzania	30% [22-40%]	25% [17-34%]	59% [52-68%]	...	...	30% [27-33%]	5.6%	...	11% [10-13%]	18% [16-21%]
Zambia	25% [19-33%]	20% [15-27%]	75% [67-85%]	...	...	44% [40-47%]	11.7%	...	27% [24-30%]	26% [23-30%]
Zimbabwe	30% [22-40%]	25% [18-34%]	46% [40-52%]	...	...	23% [21-26%]	24.7%	...	25% [22-29%]	32% [28-35%]

Sources:

Spectrum

UA reports, Spectrum

UA (N/A this yr)

UA reports, Spectrum

CEIWG  
(2008 estimates)

UA reports, Spectrum

**Annex 8 HIV and AIDS statistics, by WHO and UNICEF regions, 2010<sup>a</sup>**

	Adults and children living with HIV	Children (0-14 years) living with HIV	Adults and children newly infected with HIV	Children newly infected with HIV	% prevalence among adults (15-49 years)	AIDS-related deaths among adults and children	AIDS-related deaths among children (0-14 years)	Proportion of people 15 years and older living with HIV who are women (%)
<b>Global</b>	34 000 000 [31 600 000-35 200 000]	3 400 000 [3 000 000-3 800 000]	2 700 000 [2 400 000-2 900 000]	390 000 [340 000-450 000]	0.8 [0.8-0.8]	1 800 000 [1 600 000-1 900 000]	250 000 [220 000-290 000]	50 [47-53]
<b>WHO regions</b>								
<b>African Region</b>	22 900 000 [21 700 000-24 200 000]	3 100 000 [2 800 000-3 500 000]	1 900 000 [1 700 000-2 100 000]	350 000 [300 000-410 000]	4.7 [4.5-4.9]	1 200 000 [1 100 000-1 400 000]	230 000 [200 000-260 000]	59 [56-62]
<b>Region of the Americas</b>	3 000 000 [2 600 000-3 500 000]	58 000 [44 000-74 000]	170 000 [120 000-240 000]	5 000 [3 200-6 900]	0.5 [0.4-0.6]	96 000 [71 000-120 000]	3 600 [2 100-5 100]	31 [27-37]
<b>Eastern Mediterranean Region</b>	560 000 [410 000-790 000]	42 000 [28 000-57 000]	82 000 [54 000-130 000]	7 400 [5 200-9 800]	0.2 [0.1-0.3]	38 000 [27 000-53 000]	4 100 [2 800-5 500]	40 [29-57]
<b>European Region</b>	2 300 000 [2 100 000-2 500 000]	19 000 [15 000-25 000]	190 000 [150 000-230 000]	2 400 [1 900-2 900]	0.4 [0.4-0.5]	99 000 [84 000-120 000]	1 300 [<1 000-1 800]	32 [30-35]
<b>South-East Asia Region</b>	3 500 000 [3 000 000-3 900 000]	140 000 [92 000-190 000]	210 000 [180 000-260 000]	17 000 [11 000-25 000]	0.3 [0.3-0.3]	230 000 [190 000-260 000]	12 000 [6 800-18 000]	37 [32-41]
<b>Western Pacific Region</b>	1 300 000 [1 100 000-1 500 000]	39 000 [33 000-46 000]	130 000 [88 000-190 000]	5 000 [3 800-6 200]	0.1 [0.1-0.1]	80 000 [64 000-99 000]	2 700 [2 200-3 400]	28 [23-34]
<b>UNICEF regions</b>								
<b>Africa<sup>b</sup></b>	23 300 000 [21 900 000-24 600 000]	3 100 000 [2 800 000-3 500 000]	1 900 000 [1 700 000-2 100 000]	360 000 [310 000-420 000]	3.9 [3.7-4.1]	1 200 000 [1 100 000-1 400 000]	230 000 [200 000-270 000]	59 [56-62]
<b>Sub-Saharan Africa<sup>c</sup></b>	23 200 000 [21 900 000-24 500 000]	3 100 000 [2 800 000-3 500 000]	1 900 000 [1 700 000-2 100 000]	360 000 [310 000-420 000]	4.8 [4.5-5.0]	1 200 000 [1 100 000-1 400 000]	230 000 [200 000-270 000]	59 [56-62]
<b>Eastern and Southern Africa</b>	16 400 000 [15 600 000-17 300 000]	2 200 000 [2 000 000-2 500 000]	1 200 000 [1 100 000-1 300 000]	220 000 [190 000-260 000]	7.1 [6.8-7.4]	820 000 [750 000-900 000]	150 000 [130 000-170 000]	59 [56-62]
<b>Western and Central Africa</b>	6 500 000 [6 100 000-7 100 000]	900 000 [780 000-1 000 000]	670 000 [580 000-770 000]	130 000 [110 000-150 000]	2.8 [2.6-3.0]	410 000 [370 000-460 000]	81 000 [68 000-94 000]	59 [55-63]
<b>North Africa and the Middle East</b>	400 000 [300 000-490 000]	30 000 [19 000-40 000]	51 000 [34 000-64 000]	5 000 [3 500-6 600]	0.2 [0.2-0.3]	30 000 [21 000-37 000]	3 000 [2 000-3 900]	44 [33-53]
<b>Latin America and the Caribbean</b>	1 600 000 [1 400 000-1 900 000]	57 000 [43 000-72 000]	110 000 [83 000-150 000]	4 700 [3 000-6 500]	0.4 [0.4-0.5]	76 000 [52 000-100 000]	3 400 [1 900-4 800]	37 [31-42]
<b>Asia</b>	4 800 000 [4 300 000-5 300 000]	180 000 [130 000-230 000]	360 000 [300 000-450 000]	22 000 [16 000-30 000]	0.2 [0.2-0.2]	310 000 [260 000-340 000]	15 000 [9 400-21 000]	34 [30-38]
<b>East Asia and Pacific</b>	2 300 000 [1 900 000-2 600 000]	69 000 [60 000-78 000]	200 000 [150 000-270 000]	8 200 [6 500-10 000]	0.2 [0.1-0.2]	140 000 [100 000-140 000]	4 400 [3 500-5 400]	32 [25-35]
<b>South Asia</b>	2 500 000 [2 200 000-2 900 000]	110 000 [65 000-160 000]	160 000 [140 000-210 000]	15 000 [8 200-22 000]	0.2 [0.2-0.3]	170 000 [150 000-200 000]	11 000 [5 400-17 000]	37 [33-43]
<b>Central and Eastern Europe and the Commonwealth of Independent States</b>	1 500 000 [1 300 000-1 700 000]	18 000 [14 000-24 000]	160 000 [120 000-210 000]	2 300 [1 800-2 900]	0.7 [0.6-0.7]	91 000 [76 000-110 000]	1 200 [<1 000-1 800]	26 [20-39]
<b>Industrialized countries<sup>d</sup></b>	2 200 000 [1 900 000-2 700 000]	2 300 [1 900-2 800]	88 000 [56 000-150 000]	<500 [<500-1 000]	0.4 [0.3-0.5]	29 000 [25 000-36 000]	<500 [<500-500]	58 [23-32]

Note: Some groups do not add up to the total due to rounding.

a UN/AIDS regions (n = 9) are similar to the geographical regions (n = 6), but the geographical regions are condensed regions (see also Annex 10). The main difference is that Somalia is classified as being in sub-Saharan Africa in the geographical regions but classified as being in the Middle East and North Africa in the UN/AIDS regions.

b Africa includes all countries in the UNICEF Eastern and Southern Africa region, all countries in the UNICEF West and Central Africa region and the following countries in the UNICEF Middle East and North Africa region: Algeria, Djibouti, Egypt, Libya, Morocco, Sudan and Tunisia.

c UNICEF includes values from Djibouti and Sudan in the total for sub-Saharan Africa, but the values for these countries are excluded for the subregions in Africa.

d Defined as those not included in the UNICEF regional classification: Andorra, Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, San Marino, Slovakia, Slovenia, Sweden, Switzerland, United Kingdom and United States of America.

**Annex 9 Estimated numbers of people of all ages and children younger than 15 years receiving and needing antiretroviral therapy and antiretroviral medicine for preventing mother-to-child transmission and coverage percentages in low- and middle-income countries by WHO and UNICEF regions, 2010<sup>a</sup>**

	Number of people of all ages receiving antiretroviral therapy, December 2010	Estimated number of people needing antiretroviral therapy based on 2010 guidelines, 2010 [Range] <sup>b</sup>	Antiretroviral therapy coverage, December 2010 [Range] <sup>c</sup>	Number of children younger than 15 years receiving antiretroviral therapy, December 2010	Estimated number of children needing antiretroviral therapy, 2010 [Range] <sup>b</sup>	Antiretroviral therapy coverage among children, December 2010 [Range] <sup>d</sup>	Number of pregnant women living with HIV receiving antiretroviral medicines for preventing mother-to-child transmission, 2010	Estimated number of pregnant women with HIV needing antiretroviral medicines for preventing mother-to-child transmission, 2010 [Range] <sup>b</sup>	Estimated percentage of pregnant women living with HIV receiving antiretroviral medicines for preventing mother-to-child transmission, 2010 [Range] <sup>e</sup>
<b>WHO regions</b>									
<b>African Region</b>	5 065 000	10 300 000 [9 700 000-11 000 000]	49% [46-52%]	387 500	1 830 000 [1 600 000-2 000 000]	21% [19-24%]	815 500	1 350 000 [1 200 000-1 500 000]	60% [54-68%]
<b>Region of the Americas</b>	521 000	820 000 [710 000-920 000]	63% [57-73%]	16 300	41 400 [34 000-50 000]	39% [32-48%]	15 700	25 600 [17 000-33 000]	61% [48-94%]
<b>Eastern Mediterranean Region</b>	15 700	200 000 [150 000-270 000]	8% [6-11%]	870	25 900 [18 000-37 000]	3% [2-5%]	1 000	19 800 [14 000-26 000]	5% [4-7%]
<b>European Region</b>	129 000	570 000 [500 000-650 000]	23% [20-26%]	7 500	11 400 [10 000-13 000]	65% [55-71%]	16 400	18 600 [15 000-22 000]	88% [74-95%]
<b>South-East Asia Region</b>	717 000	1 800 000 [1 600 000-2 000 000]	39% [36-45%]	34 000	87 600 [60 000-120 000]	39% [29-57%]	18 600	57 500 [37 000-78 000]	32% [24-50%]
<b>Western Pacific Region</b>	203 000	470 000 [400 000-520 000]	43% [39-51%]	9 700	23 400 [20 000-27 000]	42% [36-49%]	5 200	14 600 [12 000-17 000]	36% [30-43%]
<b>Total</b>	<b>6 650 000</b>	<b>14 200 000</b> [13 400 000-15 000 000]	<b>47%</b> [44-50%]	<b>456 000</b>	<b>2 000 000</b> [1 800 000-2 300 000]	<b>23%</b> [20-25%]	<b>872 400</b>	<b>1 490 000</b> [1 300 000-1 600 000]	<b>59%</b> [53-66%]
<b>UNICEF regions</b>									
<b>Africa<sup>d</sup></b>	5 075 000	10 500 000 [9 800 000-11 200 000]	48% [45-52%]	387 500	1 860 000 [1 600 000-2 100 000]	21% [19-24%]	815 500	1 370 000 [1 200 000-1 500 000]	60% [53-67%]
Sub-Saharan Africa <sup>e</sup>	5 069 000	10 500 000 [9 800 000-11 200 000]	49% [45-52%]	387 900	1 860 000 [1 600 000-2 100 000]	21% [19-24%]	816 200	1 370 000 [1 200 000-1 500 000]	60% [53-67%]
Eastern and Southern Africa	4 221 000	7 600 000 [7 100 000-8 000 000]	56% [53-59%]	337 200	1 290 000 [1 100 000-1 400 000]	26% [23-29%]	730 100	940 000 [840 000-1 000 000]	77% [70-87%]
Western and Central Africa	842 000	2 800 000 [2 600 000-3 100 000]	30% [28-33%]	50 200	550 000 [480 000-630 000]	9% [8-11%]	85 400	410 000 [360 000-470 000]	21% [18-24%]
North Africa and the Middle East	14 900	150 000 [120 000-200 000]	10% [8-13%]	840	18 500 [12 000-26 000]	5% [3-7%]	1 000	14 200 [10 000-19 000]	7% [5-10%]
<b>Latin America and the Caribbean</b>	521 000	820 000 [710 000-920 000]	63% [57-73%]	16 300	41 400 [34 000-50 000]	39% [32-48%]	15 700	25 600 [17 000-33 000]	61% [48-94%]
<b>Asia</b>	922 000	2 400 000 [2 100 000-2 500 000]	39% [36-44%]	43 800	113 000 [82 000-140 000]	39% [31-53%]	23 900	73 800 [52 000-93 000]	32% [26-46%]
East Asia and Pacific	489 000	1 000 000 [810 000-1 100 000]	48% [46-60%]	20 500	42 900 [37 000-47 000]	48% [44-56%]	12 900	30 400 [22 000-33 000]	42% [39-58%]
South Asia	432 000	1 300 000 [1 200 000-1 500 000]	33% [29-37%]	23 300	69 600 [42 000-100 000]	33% [23-55%]	11 000	43 500 [25 000-64 000]	25% [17-45%]
<b>Central and Eastern Europe and the Commonwealth of Independent States<sup>f</sup></b>	123 000	550 000 [480 000-630 000]	22% [19-26%]	7 300	11 400 [10 000-13 000]	64% [54-70%]	16 300	18 200 [15 000-22 000]	89% [75-95%]
<b>Total</b>	<b>6 644 000</b>	<b>14 200 000</b> [13 300 000-15 000 000]	<b>47%</b> [44-50%]	<b>455 700</b>	<b>2 000 000</b> [1 800 000-2 300 000]	<b>23%</b> [20-25%]	<b>872 300</b>	<b>1 490 000</b> [1 300 000-1 600 000]	<b>59%</b> [53-66%]

Note: Some groups do not add up to the total due to rounding.

- a UNICEF regions ( $n = 9$ ) are similar to the geographical regions ( $n = 6$ ), but the geographical regions are condensed regions (see also Annex 10). The main difference is that Somalia is classified as being in sub-Saharan Africa in the geographical regions but classified as being in the Middle East and North Africa in the UNAIDS regions.
- b For an explanation of the methods used, see the explanatory notes for annexes.
- c The coverage estimate is based on the unrounded estimated numbers of people receiving and needing antiretroviral therapy. The ranges of the levels of coverage are based on the uncertainty ranges around the estimates of need.
- d Africa includes all countries in the UNICEF Eastern and Southern Africa region, all countries in the UNICEF West and Central Africa region and the following countries in the UNICEF Middle East and North Africa region: Algeria, Djibouti, Egypt, Libya, Morocco, Sudan and Tunisia.
- e UNICEF includes values from Djibouti and Sudan in the total for sub-Saharan Africa, but the values for these countries are excluded for the subregions in Africa.
- f UNICEF classifies five low- and middle-income countries (Hungary, Latvia, Lithuania, Poland and Slovakia) as industrialized countries, and their values are not included in these totals.

**Annex 10 Classification of low- and middle-income countries by income level, epidemic level, and geographical UNAIDS, UNICEF and WHO regions**

Country	Classification of economy	Level of epidemic	Geographical region	UNAIDS region	UNICEF region	WHO region
Afghanistan	Low income	Low	East, South and South-East Asia	South and South-East Asia	South Asia	Eastern Mediterranean Region
Albania	Lower-middle income	Low	Europe and Central Asia	Western and Central Europe	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Algeria	Lower-middle income	Low	Middle East and North Africa	Middle East and North Africa	Middle East and North Africa	African Region
Angola	Lower-middle income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Argentina	Upper-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Armenia	Lower-middle income	Concentrated	Europe and Central Asia	Eastern Europe and Central Asia	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Azerbaijan	Lower-middle income	Low	Europe and Central Asia	Eastern Europe and Central Asia	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Bangladesh	Low income	Low	East, South and South-East Asia	South and South-East Asia	South Asia	South-East Asia Region
Belarus	Lower-middle income	Concentrated	Europe and Central Asia	Eastern Europe and Central Asia	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Belize	Upper-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Benin	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Bhutan	Lower-middle income	Low	East, South and South-East Asia	South and South-East Asia	South Asia	South-East Asia Region
Bolivia (Plurinational State of)	Lower-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Bosnia and Herzegovina	Lower-middle income	Low	Europe and Central Asia	Western and Central Europe	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Botswana	Upper-middle income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Brazil	Upper-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Bulgaria	Upper-middle income	Low	Europe and Central Asia	Western and Central Europe	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Burkina Faso	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Burundi	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Cambodia	Low income	Concentrated	East, South and South-East Asia	South and South-East Asia	East Asia and the Pacific	Western Pacific Region
Cameroon	Lower-middle income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Cape Verde	Lower-middle income	Concentrated	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Central African Republic	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Chad	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Chile	Upper-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
China	Lower-middle income	Concentrated	East, South and South-East Asia	East Asia	East Asia and the Pacific	Western Pacific Region
Colombia	Lower-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Comoros	Low income	Concentrated	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Congo	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Cook Islands	Lower-middle income		Oceania	Oceania	East Asia and the Pacific	Western Pacific Region
Costa Rica	Upper-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Côte d'Ivoire	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Croatia	Upper-middle income	Low	Europe and Central Asia	Western and Central Europe	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Cuba	Lower middle income	Low	Latin America and the Caribbean	Caribbean	Latin America and Caribbean	Region of the Americas



Country	Classification of economy	Level of epidemic	Geographical region	UNAIDS region	UNICEF region	WHO region
Democratic People's Republic of Korea	Not a World Bank member	Low	East, South and South-East Asia	East Asia	East Asia and the Pacific	South-East Asia Region
Democratic Republic of the Congo	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Djibouti*	Lower-middle income	Generalized	Middle East and North Africa	Middle East and North Africa	Middle East and North Africa	Eastern Mediterranean Region
Dominica	Upper-middle income	Concentrated	Latin America and the Caribbean	Caribbean	Latin America and Caribbean	Region of the Americas
Dominican Republic	Lower-middle income	Concentrated	Latin America and the Caribbean	Caribbean	Latin America and Caribbean	Region of the Americas
Ecuador	Lower-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Egypt	Lower-middle income	Low	Middle East and North Africa	Middle East and North Africa	Middle East and North Africa	Eastern Mediterranean Region
El Salvador	Lower-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Equatorial Guinea	Upper-middle income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Eritrea	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Ethiopia	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Fiji	Lower-middle income	Low	Oceania	Oceania	East Asia and the Pacific	Western Pacific Region
Gabon	Upper-middle income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Gambia	Low income	Concentrated	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Georgia	Lower-middle income	Low	Europe and Central Asia	Eastern Europe and Central Asia	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Ghana	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Grenada	Upper-middle income	Concentrated	Latin America and the Caribbean	Caribbean	Latin America and Caribbean	Region of the Americas
Guatemala	Lower-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Guinea	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Guinea-Bissau	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Guyana	Lower-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Haiti	Low income	Generalized	Latin America and the Caribbean	Caribbean	Latin America and Caribbean	Region of the Americas
Honduras	Lower-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Hungary	Upper-middle income	Low	Europe and Central Asia	Western and Central Europe	Industrialized countries	European Region
India	Low income	Concentrated	East, South and South-East Asia	South and South-East Asia	South Asia	South-East Asia Region
Indonesia	Lower-middle income	Concentrated	East, South and South-East Asia	South and South-East Asia	East Asia and the Pacific	South-East Asia Region
Iran (Islamic Republic of)	Lower-middle income	Low	Middle East and North Africa	Middle East and North Africa	Middle East and North Africa	Eastern Mediterranean Region
Iraq	Lower-middle income	Low	Middle East and North Africa	Middle East and North Africa	Middle East and North Africa	Eastern Mediterranean Region
Jamaica	Lower-middle income	Concentrated	Latin America and the Caribbean	Caribbean	Latin America and Caribbean	Region of the Americas
Jordan	Lower-middle income	Low	Middle East and North Africa	Middle East and North Africa	Middle East and North Africa	Eastern Mediterranean Region
Kazakhstan	Upper-middle income	Concentrated	Europe and Central Asia	Eastern Europe and Central Asia	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Kenya	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Kiribati	Lower-middle income	Concentrated	Oceania	Oceania	East Asia and the Pacific	Western Pacific Region
Kyrgyzstan	Low income	Concentrated	Europe and Central Asia	Eastern Europe and Central Asia	Central and Eastern Europe and the Commonwealth of Independent States	European Region

Country	Classification of economy	Level of epidemic	Geographical region	UNAIDS region	UNICEF region	WHO region
Lao People's Democratic Republic	Low income	Low	East, South and South-East Asia	South and South-East Asia	East Asia and the Pacific	Western Pacific Region
Latvia	Upper-middle income	Concentrated	Europe and Central Asia	Western and Central Europe	Industrialized countries	European Region
Lebanon	Upper-middle income	Low	Middle East and North Africa	Middle East and North Africa	Middle East and North Africa	Eastern Mediterranean Region
Lesotho	Lower-middle income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Liberia	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Libya	Upper-middle income	Low	Middle East and North Africa	Middle East and North Africa	Middle East and North Africa	Eastern Mediterranean Region
Lithuania	Upper-middle income	Low	Europe and Central Asia	Western and Central Europe	Industrialized countries	European Region
Madagascar	Low income	Concentrated	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Malawi	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Malaysia	Upper-middle income	Concentrated	East, South and South-East Asia	South and South-East Asia	East Asia and the Pacific	Western Pacific Region
Maldives	Lower-middle income	Low	East, South and South-East Asia	South and South-East Asia	South Asia	South-East Asia Region
Mali	Low income	Concentrated	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Marshall Islands	Lower-middle income	Concentrated	Oceania	Oceania	East Asia and the Pacific	Western Pacific Region
Mauritania	Low income	Concentrated	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Mauritius	Upper-middle income	Concentrated	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Mexico	Upper-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Micronesia (Federated States of)	Lower-middle income	Concentrated	Oceania	Oceania	East Asia and the Pacific	Western Pacific Region
Mongolia	Low income	Low	East, South and South-East Asia	East Asia	East Asia and the Pacific	Western Pacific Region
Montenegro	Upper-middle income	Low	Europe and Central Asia	Western and Central Europe	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Morocco	Lower-middle income	Low	Middle East and North Africa	Middle East and North Africa	Middle East and North Africa	Eastern Mediterranean Region
Mozambique	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Myanmar	Low income	Concentrated	East, South and South-East Asia	South and South-East Asia	East Asia and the Pacific	South-East Asia Region
Namibia	Lower-middle income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Nauru	Not a World Bank member		Oceania	Oceania	East Asia and the Pacific	Western Pacific Region
Nepal	Low income	Concentrated	East, South and South-East Asia	South and South-East Asia	South Asia	South-East Asia Region
Nicaragua	Lower-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Niger	Low income	Concentrated	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Nigeria	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Niue	Not a World Bank member		Oceania	Oceania	East Asia and the Pacific	Western Pacific Region
Oman	Upper-middle income	Low	Middle East and North Africa	Middle East and North Africa	Middle East and North Africa	Eastern Mediterranean Region
Pakistan	Low income	Low	East, South and South-East Asia	South and South-East Asia	South Asia	Eastern Mediterranean Region
Palau	Upper-middle income		Oceania	Oceania	East Asia and the Pacific	Western Pacific Region
Panama	Upper-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Papua New Guinea	Low income	Generalized	Oceania	Oceania	East Asia and the Pacific	Western Pacific Region

Country	Classification of economy	Level of epidemic	Geographical region	UNAIDS region	UNICEF region	WHO region
Paraguay	Lower-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Peru	Lower-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Philippines	Lower-middle income	Low	East, South and South-East Asia	South and South-East Asia	East Asia and the Pacific	Western Pacific Region
Poland	Upper-middle income	Concentrated	Europe and Central Asia	Western and Central Europe	Industrialized countries	European Region
Republic of Moldova	Lower-middle income	Concentrated	Europe and Central Asia	Eastern Europe and Central Asia	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Romania	Upper-middle income	Low	Europe and Central Asia	Western and Central Europe	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Russian Federation	Upper-middle income	Concentrated	Europe and Central Asia	Eastern Europe and Central Asia	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Rwanda	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Saint Kitts and Nevis	Upper-middle income		Latin America and the Caribbean	Caribbean	Latin America and Caribbean	Region of the Americas
Saint Lucia	Upper-middle income		Latin America and the Caribbean	Caribbean	Latin America and Caribbean	Region of the Americas
Saint Vincent and the Grenadines	Upper-middle income		Latin America and the Caribbean	Caribbean	Latin America and Caribbean	Region of the Americas
Samoa	Lower-middle income		Oceania	Oceania	East Asia and the Pacific	Western Pacific Region
Sao Tome and Principe	Low income	Low	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Senegal	Low income	Concentrated	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Serbia	Upper-middle income	Low	Europe and Central Asia	Western and Central Europe	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Seychelles	Upper-middle income	Low	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Sierra Leone	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Slovakia	Upper-middle income	Low	Europe and Central Asia	Western and Central Europe	Industrialized countries	European Region
Solomon Islands	Low income		Oceania	Oceania	East Asia and the Pacific	Western Pacific Region
Somalia	Low income	Concentrated	Sub-Saharan Africa	Middle East and North Africa	Eastern and Southern Africa	Eastern Mediterranean Region
South Africa	Upper-middle income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Sri Lanka	Lower-middle income	Low	East, South and South-East Asia	South and South-East Asia	South Asia	South-East Asia Region
Sudan <sup>a</sup>	Low income	Generalized	Middle East and North Africa	Middle East and North Africa	Middle East and North Africa	Eastern Mediterranean Region
Suriname	Lower-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Swaziland	Lower-middle income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Syrian Arab Republic	Lower-middle income	Low	Middle East and North Africa	Middle East and North Africa	Middle East and North Africa	Eastern Mediterranean Region
Tajikistan	Low income	Low	Europe and Central Asia	Eastern Europe and Central Asia	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Thailand	Lower-middle income	Concentrated	East, South and South-East Asia	South and South-East Asia	East Asia and the Pacific	South-East Asia Region
The former Yugoslav Republic of Macedonia	Lower-middle income	Low	Europe and Central Asia	Western and Central Europe	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Timor-Leste	Low income	Low	East, South and South-East Asia	South and South-East Asia	East Asia and the Pacific	South-East Asia Region
Togo	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	West and Central Africa	African Region
Tonga	Lower-middle income		Oceania	Oceania	East Asia and the Pacific	Western Pacific Region
Tunisia	Lower-middle income	Low	Middle East and North Africa	Middle East and North Africa	Middle East and North Africa	Eastern Mediterranean Region
Turkey	Upper-middle income	Low	Europe and Central Asia	Western and Central Europe	Central and Eastern Europe and the Commonwealth of Independent States	European Region

Country	Classification of economy	Level of epidemic	Geographical region	UNAIDS region	UNICEF region	WHO region
Turkmenistan	Lower-middle income	Low	Europe and Central Asia	Eastern Europe and Central Asia	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Tuvalu	Not a World Bank member		Oceania	Oceania	East Asia and the Pacific	Western Pacific Region
Uganda	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Ukraine	Lower-middle income	Concentrated	Europe and Central Asia	Eastern Europe and Central Asia	Central and Eastern Europe and the Commonwealth of Independent States	European Region
United Republic of Tanzania	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Uruguay	Upper-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Uzbekistan	Low income	Concentrated	Europe and Central Asia	Eastern Europe and Central Asia	Central and Eastern Europe and the Commonwealth of Independent States	European Region
Vanuatu	Lower-middle income		Oceania	Oceania	East Asia and the Pacific	Western Pacific Region
Venezuela (Bolivarian Republic of)	Upper-middle income	Concentrated	Latin America and the Caribbean	Central and South America	Latin America and Caribbean	Region of the Americas
Viet Nam	Low income	Concentrated	East, South and South-East Asia	South and South-East Asia	East Asia and the Pacific	Western Pacific Region
Yemen	Low income	Low	Middle East and North Africa	Middle East and North Africa	Middle East and North Africa	Eastern Mediterranean Region
Zambia	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region
Zimbabwe	Low income	Generalized	Sub-Saharan Africa	Sub-Saharan Africa	Eastern and Southern Africa	African Region

a UNICEF classifies Djibouti both under Middle East and North Africa and sub-Saharan Africa. For the analysis throughout the report, Djibouti is classified as Middle East and North Africa.

b For the analysis throughout the report, values for Sudan have been included in Middle East and North Africa based on UNAIDS classification, while UNICEF classifies Sudan both under Middle East and North Africa, and sub-Saharan Africa.

**General country information**

- #1 Number of administrative units in the country
- #2 Number of health facilities

**A Testing and counselling**

- #A1 Number of health facilities that provide HIV testing and counselling services
- #A2 Number of women and men aged 15 and older who received HIV testing and counselling (T&C) in the last 12 months and know their results
- #A3 Percentage of women and men aged 15–49 who received an HIV test in the last 12 months and who know their results
- #A4 Percentage of most-at-risk populations (MARPs) who received an HIV test in the last 12 months and who know their results

**B Prevention in health care settings**

- #B1 Percentage of health care facilities where all therapeutic injections are given with new, disposable, single use injection equipment
- #B2 Number of health facilities with post-exposure prophylaxis (PEP) services available on site

**C Prevention of sexual transmission of HIV and prevention of transmission through injecting drug use**

- #C1 Estimated number of injecting drug users (IDUs)
- #C2 Number of needle and syringe programme (NSP) sites
- #C3 Number of people on opioid substitution therapy (OST)
- #C4 Number of syringes/needles distributed by needle and syringe programmes (NSP)
- #C5a Percentage of injecting drug users (IDUs) reporting the use of sterile injecting equipment the last time they injected
- #C5b Percentage of injecting drug users (IDUs) reporting the use of a condom the last time they had sexual intercourse
- #C5c Percentage of female and male sex workers (SWs) reporting the use of a condom with their most recent client
- #C5d Percentage of men reporting the use of a condom the last time they had anal sex with a male partner
- #C6a Percentage of injecting drug users (IDUs) who are HIV-infected
- #C6b Percentage of sex workers (SWs) who are HIV-infected
- #C6c Percentage of men who have sex with men (MSM) who are HIV-infected

**D Care**

- #D1 Percentage of adults and children enrolled in HIV care and eligible for cotrimoxazole (CTX) prophylaxis (according to national guidelines) currently receiving CTX prophylaxis

**E HIV/TB**

- #E1 Percentage of health-care facilities providing ART services for people living with HIV with demonstrable infection control practices that include TB control
- #E2 Percentage of estimated HIV-positive incident TB cases that received treatment for TB and HIV
- #E3 Percentage of adults and children newly enrolled in HIV care starting isoniazid preventive therapy (IPT)
- #E4 Percentage of adults and children enrolled in HIV care who had TB status assessed and recorded during their last visit

**F Sexually transmitted infections**

- #F1 Percentage of women accessing antenatal care (ANC) services who were tested for syphilis at first ANC visit
- #F2 Percentage of antenatal care attendees who were positive for syphilis
- #F3 Percentage of antenatal care attendees positive for syphilis who received treatment
- #F4 Percentage of sex workers with active syphilis
- #F5 Percentage of men who have sex with men (MSM) with active syphilis

## **G Antiretroviral therapy (ART)**

- #G1 Number of health facilities that offer antiretroviral therapy (ART)
- #G2a Percentage eligible adults and children currently receiving antiretroviral therapy
- #G2b Number of eligible adults and children who newly enrolled on antiretroviral therapy during the reporting period (2010)
- #G3a Percentage of adults and children with HIV still alive and known to be on treatment 12 months after initiation of antiretroviral therapy among those who initiated in 2009
- #G3b Percentage of adults and children with HIV still alive and known to be on treatment 24 months after initiation of antiretroviral therapy among those who initiated in 2008
- #G3e Percentage of adults and children with HIV still alive and known to be on treatment 60 months after initiation of antiretroviral therapy among those who initiated in 2005

## **H Health systems**

- #H1 Percentage of health facilities dispensing antiretrovirals (ARVs) that have experienced a stock-out of at least one required ARV in the last 12 months
- #H2 Percentage of facilities providing ART using CD4 monitoring in line with national guidelines/policies, on site or through referral

## **I Women and children**

- #I1 Number of pregnant women attending ANC at least once during the reporting period
- #I2a Number of health facilities providing ANC services
- #I2c Number of health facilities providing ANC services that also provide HIV testing and counselling for pregnant women
- #I2d Number of health facilities providing ANC services that offer both HIV testing and antiretroviral drugs for the prevention of mother-to-child transmission on site
- #I2b Number of health facilities providing ANC services that also provide CD4 testing on site, or have a system for collecting and transporting blood samples for CD4 testing for HIV-infected pregnant women
- #I3 Number of health facilities that offer paediatric ART
- #I4 Percentage of health facilities that provide virological testing services (e.g. PCR) for diagnosis of HIV in infants on site or from dried blood spots (DBS)
- #I5 Percentage of pregnant women who were tested for HIV and received their results – during pregnancy, during labour and delivery, and during the post-partum period (<72 hours), including those with previously known HIV status
- #I6 Percentage of pregnant women attending antenatal care whose male partner was tested for HIV
- #I7 Percentage of HIV-infected pregnant women assessed for ART eligibility through either clinical staging or CD4 testing
- #I8 Percentage of HIV-infected pregnant women who received antiretroviral drugs to reduce the risk of mother-to-child transmission (MTCT)
- #I9 Percentage of infants born to HIV-infected women receiving antiretroviral prophylaxis for prevention of mother-to-child transmission (PMTCT)
- #I10 Percentage of infants born to HIV-infected women started on cotrimoxazole (CTX) prophylaxis within two months of birth
- #I11 Percentage of infants born to HIV-infected women receiving a virological test for HIV within two months of birth
- #I12 Distribution of feeding practices (exclusive breastfeeding, replacement feeding, mixed feeding/other) for infants born to HIV-infected women at DTP3 visit
- #I13 Percentage of HIV-infected children aged 0–14 years who are currently receiving ART

## Explanatory notes

### Data collection and validation

Annex 1 presents country data on sexually transmitted infections.

Annex 2 presents country data on health facilities providing HIV testing and counselling services and uptake of testing and counselling among adults.

Annex 3 presents country survey data on HIV testing and counselling among key populations at higher risk of HIV infection and transmission.

Annexes 4 and 5 present country data related to antiretroviral therapy.

Annex 6 presents country data on interventions related to preventing the mother-to-child transmission of HIV and interventions targeting children.

Annex 7 presents key indicators for the 22 priority countries for the Global Plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive.

Annex 8 presents breakdowns, according to WHO and UNICEF regions, of key epidemiological indicators.

Annex 9 presents breakdowns, according to WHO and UNICEF regions, of key indicators on antiretroviral therapy coverage and coverage of antiretroviral medicine for preventing mother-to-child transmission.

Annex 10 lists countries with epidemic and economic classifications.

Annex 11 lists the indicators collected from countries for this report.

WHO, UNICEF and UNAIDS collected the data presented in these annexes through the annual reporting tool for monitoring the health sector response to HIV/AIDS (1). The reporting tool was sent to countries in January 2011. To facilitate collaboration at the country level, the country offices of WHO, UNICEF and UNAIDS worked jointly with national counterparts and partner agencies to collate and validate data in a single collaborative consultation process. The countries sent the data to the regional offices and to WHO and UNICEF headquarters between March and April 2011.

In addition, an international data reconciliation meeting was organized in June 2011 to review and cross-validate data reported to WHO, UNICEF, the UNAIDS Secretariat, the Global Fund to Fight AIDS, Tuberculosis and Malaria and the United States President's Emergency Plan for AIDS Relief. When discrepancies were identified between data reported to the different organizations, follow-up letters were sent to UNAIDS, UNICEF and WHO country offices to liaise with national authorities to seek clarification and resolve the discrepancies.

### Explanatory notes for Annex 1

#### Percentage of women attending antenatal care tested for syphilis at the first visit

The coverage of syphilis testing among women attending antenatal care for the first time is generally derived from national programme records. Data from sentinel surveys were included in the 2011 report only they were considered representative of the national programme. Data are presented for 61 reporting low- and middle-income countries. The data should be interpreted with caution, especially as the reported denominator does not always represent the majority of women attending antenatal care.

#### Percentage of women attending antenatal care seropositive for syphilis

Data on the prevalence of syphilis among women attending antenatal care can be reported from national programme records, sentinel surveillance or other special studies. For purposes of this indicator, seropositivity was defined as having either a positive treponemal or a non-treponemal test result. Data are presented for 75 reporting low- and middle-income countries. The data should be interpreted with caution, since the type of test used to determine seropositivity varied by country.

#### Active syphilis seroprevalence among sex workers

Data on the seroprevalence of active syphilis among sex workers can be obtained from sentinel surveillance or special surveys. Because of the frequency of previous syphilis infections, this indicator defined active syphilis as being positive on both a treponemal and non-treponemal test. Data are presented for 40 reporting low- and middle-income countries. The data should be interpreted with caution, since the type of test used to determine seropositivity varied by country.

### **Active syphilis seroprevalence among men who have sex with men**

Data on the seroprevalence of active syphilis among men who have sex with men can be obtained from sentinel surveillance or special surveys. Because of the frequency of previous syphilis infections, this indicator defined active syphilis as being positive on both a treponemal and non-treponemal test. Data are presented for 31 low- and middle-income reporting countries. The data should be interpreted with caution, since the type of test used to determine seropositivity varied by country.

### **Explanatory notes for Annex 2**

Annex 2 presents country data on the scaling up of HIV testing and counselling services for 2009–2010 and provides country-specific data on the availability of HIV testing and counselling services in health facilities at the national level for adults in 118 (2009) and 119 (2010) low- and middle-income countries.

It also provides country-specific data on the uptake of HIV testing and counselling for adults in 110 low- and middle-income countries.

### **Number of health facilities with HIV testing and counselling services**

The number of health facilities with HIV testing and counselling services is based on data summarized at the national or subnational level as reported by countries. Aggregated data should include facilities providing services in the private and nongovernmental organization sectors and voluntary testing and counselling sites but this is not always possible in some countries. A total of 119 countries reported data in 2010.

### **Number of people 15 years and older who received HIV testing and counselling and know the results**

The number of adults who received HIV testing and counselling in the past 12 months and know the results is collected from routine reports from all service points, which includes voluntary counselling and testing sites, clinics, hospitals and nongovernmental organization outreach points. Data are compiled at the district or local level and finally at the national level. A total of 110 countries reported data in 2010. These data are not corrected for the fraction of people who have been tested more than once in the year.

### **Explanatory notes for Annex 3**

Annex 3 presents data on access to testing and counselling services for key populations at higher risk of HIV infection.

Annex 3a–c reports on the coverage of testing and counselling services respectively for people who inject drugs (26 countries), men who have sex with men (41 countries) and sex workers (52 countries). The data reported by countries come from surveys among specific populations between 2008 and 2010. When the sample is less than 100, the data are not reported.

Annex 3d–e reports on the coverage of testing and counseling services respectively for people who inject drugs (14 countries), men who have sex with men (16 countries) and sex workers (23 countries) for countries who have reported more than one survey in the considered population between 2006 and 2010. The results of data collected between 2006 and 2008 are presented separately from those collected between 2009 and 2010.

The data should be interpreted with caution, since they may have been generated through surveys that are not nationally representative. Some survey results may overestimate the proportion of people accessing services.

### **Explanatory notes for Annexes 4 and 5**

Annexes 4 and 5 present country data on access to antiretroviral therapy.

Annex 4 provides country-specific data on access to antiretroviral therapy at the national level for all age groups in 149 low- and middle-income countries, of which 138 countries reported data for 2010. Data from the private sector have been provided as footnotes.

In addition, the report presents the most recent available data from high-income countries.

### **Number of people receiving antiretroviral therapy**

The reported data on people currently receiving antiretroviral therapy, both in low- and middle-income countries and in high-income countries, were compiled from the most recent reports from health ministries or from other reliable sources in the countries, such as bilateral partners, foundations and nongovernmental agencies that are major providers of treatment services. WHO, UNAIDS and UNICEF work with countries to obtain as many facility-specific data as possible on the numbers of people receiving treatment

Of the 149 low- and middle-income countries, 133 countries provided data on access to antiretroviral therapy in December 2010. These accounted for 91% of the people receiving treatment by the end of 2010. For five countries, including Thailand and Uganda, data are available for September or November 2010. Together, these 138 countries represent more than 99% of the total estimated



number of people receiving antiretroviral therapy at the end of 2010 in low- and middle-income countries. Only 11 relatively small countries did not report for 2010.

Estimating the number of people receiving antiretroviral therapy involves some uncertainty for countries that have not yet established regular reporting systems that can capture accurate data on people who initiate treatment for the first time, people who discontinue treatment, people who are lost to follow-up and people who die.

Uncertainty may also arise because of the difficulty in measuring the extent of treatment provided in the for-profit and not-for-profit private sector. Some people receive treatment through nongovernmental organizations and/or private clinics that do not report through official channels in some countries. Private companies may have programmes to support the provision of antiretroviral therapy to workers with advanced HIV disease but do not report the data related to these programmes to the public health authorities in some cases.

### **Estimating treatment need and coverage**

Standard methods were used for estimating the size and course of the HIV epidemic, number of people living with HIV, new infections, mortality attributable to AIDS and treatment need (2,3). Treatment need is estimated using statistical modelling methods that include all people who meet the criteria for initiating treatment, whether or not these people know their HIV status and their eligibility for antiretroviral therapy (Box 5.9).

The estimates of antiretroviral therapy coverage presented in Annex 4 were calculated by dividing the number of people receiving antiretroviral therapy at the end of 2010 by the estimated number of people who need treatment in 2010. Ranges around the levels of coverage are based on the uncertainty ranges around the estimates of need (4). Some countries have developed their own methods for estimating treatment need, which could differ from the estimates derived using UNAIDS/WHO methods. To analyse and compare antiretroviral therapy coverage across countries, the report uses standardized estimates of treatment need using UNAIDS/WHO methods.

Annex 5 provides data on access to antiretroviral therapy disaggregated by sex and by age (adults – 15 years and older; children – younger than 15 years) for low- and middle-income countries. Disaggregated data on the number of children and adults receiving antiretroviral therapy are available for 136 countries. Overall, 128 countries provided breakdowns by age group for 2010. Data disaggregated by sex were available for 131 countries, of which 115 reported for 2010. Annex 5 reports also on estimated treatment need and coverage of antiretroviral therapy for children younger than 15 years by country in 2010.

The treatment needs of children are estimated using standard UNAIDS/WHO methods, including uncertainty ranges (see Box 7.16).

The 2010 WHO treatment guidelines (3) recommend that all children younger than 24 months living with HIV be provided with antiretroviral therapy regardless of CD4 counts.

The estimates of antiretroviral therapy coverage for children presented in Annex 5 were calculated by dividing the number of children receiving antiretroviral therapy at the end of 2010 by the estimated number of children who need treatment in 2010 (based on UNAIDS/WHO methods). Ranges around the levels of coverage are based on the uncertainty ranges around the estimates of need (4).

The need estimates of some countries are currently being reviewed, and these countries therefore expressed a preference that their estimates not be published (or only a range), but their estimates are nevertheless used to estimate the regional estimates and coverage.

## **Explanatory notes for Annex 6**

### **Prevention of mother-to-child transmission**

Annex 6 provides data on the indicators collected through the WHO, UNICEF and UNAIDS annual reporting form for monitoring the health sector response to HIV/AIDS (1).

### **Number of pregnant women living with HIV receiving antiretroviral medicine for preventing mother-to-child transmission**

The number of pregnant women living with HIV receiving antiretroviral medicine for preventing mother-to-child transmission is based on national programme data aggregated from facilities or other service delivery sites and as reported by countries.

A total of 136 countries reported data for 2010. These 136 countries accounted for nearly all (99.7%) of the estimated 1.49 million pregnant women living with HIV in low- and middle-income countries. Among these countries, 101 countries, representing 98% of the pregnant women in low- and middle-income countries that reported receiving any antiretroviral medicine, provided disaggregated data on antiretroviral regimens in 2010. The reported number of pregnant women includes only the most effective regimens as recommended by WHO (antiretroviral therapy and combination regimens) and excludes single-dose nevirapine (see Box 7.11). In some countries, comprehensive disaggregated data on antiretroviral regimens are not available. In these cases, the distribution

of regimens was applied to the uncategorized portion of antiretroviral regimen in the country to estimate the number of pregnant women receiving the most effective regimen (excluding single-dose nevirapine).

### **Estimating the number of pregnant women living with HIV who need antiretroviral medicine for preventing mother-to-child transmission**

The number of pregnant women living with HIV who need antiretroviral medicine for preventing mother-to-child transmission is estimated using standardized statistical modelling based on UNAIDS/WHO methods that consider various epidemic and demographic parameters and the national programme coverage of antiretroviral therapy in the country, such as the HIV prevalence among women of reproductive age and the effect of HIV on fertility and antiretroviral therapy coverage (2). These statistical modelling procedures are used to derive a comprehensive population-based estimate of the total number of pregnant women living with HIV who need antiretroviral medicine for preventing mother-to-child transmission in the country. Regular scientific updates have been provided on these tools (5).

Similar to the estimates of antiretroviral therapy need presented in Annex 4, Annex 6 presents uncertainty ranges around the estimated population needing antiretroviral medicine to prevent the mother-to-child transmission of HIV and, accordingly, the coverage of pregnant women living with HIV receiving antiretroviral medicine for preventing mother-to-child transmission. The need estimates of some countries are currently being reviewed, and these countries therefore expressed a preference that their estimates not be published (or only a range), but their estimates are nevertheless used to estimate the regional needs and coverage.

### **Coverage of pregnant women living with HIV receiving antiretroviral medicine for preventing mother-to-child transmission**

The coverage of antiretroviral medicine for preventing the mother-to-child transmission of HIV is calculated by dividing the number of pregnant women living with HIV who received the most effective antiretroviral regimens (excluding single dose nevirapine) for preventing mother-to-child transmission of HIV in 2010 by the estimated number of pregnant women living with HIV who need antiretroviral medicine for preventing mother-to-child transmission in the country.

The ranges around the levels of coverage are based on the uncertainty ranges around the estimates of need. Point estimates and ranges are given for countries with a generalized epidemic, whereas only ranges are given for countries with a concentrated epidemic.

In addition, Annex 6 also presents data on the following indicators:

- the number and percentage of pregnant women tested for HIV;
- the number and percentage of infants born to women living with HIV receiving antiretroviral medicine for preventing mother-to-child transmission;
- the number and percentage of infants born to women living with HIV receiving co-trimoxazole prophylaxis within two months of birth; and
- the number and percentage of infants born to women living with HIV receiving a virological test by two months of birth.

### **Explanatory notes for Annex 7**

Annex 7 presents data on key indicators for the 22 focus countries of the Global Plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive (6). The indicators are those identified in the framework for monitoring the Global Plan.

Among these indicators, the following are modelled, using the Spectrum UNAIDS/WHO software (see Box 2.4):

- number of women living with HIV delivering (2009 and 2010)
- new paediatric HIV infections (2009 and 2010)
- HIV incidence in women 15–49 years old (2009 and 2010)
- mother-to-child transmission rate (2009 and 2010).

Others are coverage indicators, using country-reported data for the numerators and estimated needs using spectrum software for the denominator:

- coverage of maternal antiretroviral medicine (prophylaxis and antiretroviral therapy) without single-dose nevirapine, 2010;
- antiretroviral therapy coverage among pregnant women; and
- antiretroviral therapy coverage among children.

Three other denominators are collected from other sources:

- HIV-associated maternal deaths (2008) (7);
- Percentage of Under five deaths due to HIV (2008) from *World health statistics 2011* (8); and
- the unmet need for family planning from *World health statistics 2011* (8).

For the last indicator, coverage of antiretroviral medicine during breastfeeding, no data are currently available. WHO, UNICEF and UNAIDS will support countries for collecting this information.

## Explanatory notes for Annex 10

### Classification by income

Unless stated otherwise, all data analysis in this report is based on data from 149 countries classified as low- and middle income by the World Bank as of July 2007 (9).

Economies are classified as low, middle or high income according to the gross national income per capita, calculated using the World Bank Atlas method (to reduce the effect of exchange-rate fluctuation). The groups are: low income, US\$ 905 or less; lower-middle income, US\$ 906 to US\$ 3595; upper-middle income, US\$ 3896–US\$ 11 115; and high income, US\$ 11 116 or more.

### Classification by HIV epidemic level

HIV epidemics are categorized as low level, concentrated and generalized based on the following principles and numerical proxies.

#### Low level

*Principle.* Although HIV infection may have existed for many years, it has never spread to significant levels in any subpopulation. Recorded infection is largely confined to individuals with high-risk behaviour, such as sex workers, people who inject drugs and men who have sex with men. This epidemic state suggests that networks of risk are rather diffuse (with low levels of partner exchange or sharing of drug-injecting equipment) or that the virus has been introduced very recently.

#### Concentrated

*Principle.* HIV has spread rapidly in a defined subpopulation but is not well established in the general population. This epidemic state suggests active networks of risk within the subpopulation. The future course of the epidemic is determined by the frequency and nature of links between highly infected subpopulations and the general population.

#### Generalized

*Principle.* In generalized epidemics, HIV is firmly established in the general population. Although populations at higher risk may continue to contribute disproportionately to the transmission of HIV, sexual networking in the general population is sufficient to sustain an epidemic independent of populations at higher risk of infection and transmission.

### Classification by geographical region

This report presents data on 149 low- and middle-income countries by geographical region.<sup>1</sup> The geographical regions are based on UNAIDS regions, with one difference: Somalia is classified as being in sub-Saharan Africa in the geographical regions but classified as being in the Middle East and North Africa in the UNAIDS regions.<sup>2</sup> East, South and South-East Asia combines two UNAIDS regions, as does Latin America and the Caribbean as well as Eastern Europe and Central Asia. The 149 countries are therefore categorized as follows: sub-Saharan Africa (n = 46); Latin America and the Caribbean (n = 29); East, South and South-East Asia (n = 20); Europe and Central Asia (n = 26); and North Africa and the Middle East (n = 14). In Oceania (n = 14), only Fiji and Papua New Guinea have estimated needs. For this report, the values for Oceania are included in East, South and South-East Asia.

For the period of data collection, WHO had 193 Member States grouped in six regions, and 149 WHO of these were low- and middle-income countries: WHO African Region (n = 46); WHO Region of the Americas (n = 29); WHO Eastern Mediterranean Region (n = 16); WHO European Region (n = 26); WHO South-East Asia Region (n = 11); and WHO Western Pacific Region (n = 21). Annex 4 lists the remaining 44 high-income countries in the second section.

UNICEF groups the 149 low- and middle-income countries into seven regions: Eastern and Southern Africa (n = 22); West and Central Africa (n = 24); East Asia and the Pacific (n = 26); Latin America and the Caribbean (n = 29); South Asia (n = 8); North Africa and the Middle East (n = 14); and Central and Eastern Europe and the Commonwealth of Independent States (n = 21). Five middle-income countries are classified as being industrialized.

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<sup>1</sup> With South Sudan becoming independent on 9 July 2011, the number of United Nations and WHO Member States is now 194, and 150 of these are low- and middle-income countries. The data collected for this report apply to the period before South Sudan became independent.

<sup>2</sup> UNAIDS brings together the efforts and resources of 10 United Nations System organizations in the response to HIV. The 10 UNAIDS Cosponsors are:

- Office of the United Nations High Commissioner for Refugees (UNHCR);
- United Nations Children's Fund (UNICEF);
- World Food Programme (WFP);
- United Nations Development Programme (UNDP);
- United Nations Population Fund (UNFPA);
- United Nations Office on Drugs and Crime (UNODC);
- International Labour Organization (ILO);
- United Nations Educational, Scientific and Cultural Organization (UNESCO);
- World Health Organization (WHO); and
- World Bank.

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