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Scaling up priority HIV/AIDS interventions
in the health sector

Progress Report, April 2007



**World Health
Organization**



UNAIDS
JOINT UNITED NATIONS PROGRAMME ON HIV/AIDS

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EXECUTIVE SUMMARY

At the June 2006 United Nations General Assembly High-Level Meeting on HIV/AIDS, United Nations Member States agreed to work towards the goal of "universal access to comprehensive prevention programmes, treatment, care and support" by 2010.

Drawing on lessons from the scale-up of HIV interventions over the last few years, WHO, as the UNAIDS cosponsor responsible for the health sector response to HIV/AIDS, has established priorities for its technical work and support to countries on the basis of the following five Strategic Directions, each of which represents a critical area where the health sector must invest if significant progress is to be made towards achieving universal access.

1. Enabling people to know their HIV status.
2. Maximizing the health sector's contribution to HIV prevention.
3. Accelerating the scale-up of HIV/AIDS treatment and care.
4. Strengthening and expanding health systems.
5. Investing in strategic information to guide a more effective response.

In this context, WHO undertook at the World Health Assembly in May 2006 to monitor and evaluate the global health sector response in scaling up towards universal access and to produce annual reports. This first report addresses progress in scaling up the following health sector interventions.

- Antiretroviral therapy.
- Prevention of mother-to-child transmission of HIV (PMTCT).
- HIV testing and counselling.
- Interventions for injecting drug users (IDUs).
- Control of sexually transmitted infections (STIs) to prevent HIV transmission.
- Surveillance of the HIV/AIDS epidemic.

From 2008 onwards, the annual reports will provide data on the scale-up of other selected interventions and on progress in overcoming health system barriers to achieving universal access.

Antiretroviral therapy

Encouraging global trends continue in the scale-up of antiretroviral treatment. In 2006, almost 700 000 people received treatment for the first time. By December 2006 it was estimated that 2 015 000 (1.8–2.2 million) people living with HIV/AIDS were receiving treatment in low- and middle-income countries, representing 28% (24%–34%) of the estimated 7.1 million (6.0–8.4 million) people in need.

Sub-Saharan Africa is now estimated to have more than 1.3 million people on antiretroviral treatment, with coverage of 28% (24%–33%), whereas three years earlier there were 100 000 on treatment and coverage amounted to only 2%. Of the people now receiving antiretroviral treatment in low- and middle-income countries, 67% live in sub-Saharan Africa, whereas only 25% were doing so in late 2003.

In East, South and South-East Asia, 280 000 (225 000–335 000) people are now on treatment and coverage is estimated at 19% (13%–28%), representing a fourfold increase in comparison with the end of 2003, when 70 000 were on treatment. Although Asia represents 21% (17%–25%) of global treatment need, only 14% (13%–15%) of people on treatment in low- and middle-income countries live in this region.

In Latin America and the Caribbean the number of people receiving treatment has increased gradually to 355 000 (315 000–395 000); only 210 000 were doing so at the end of 2003. While there are considerable variations between countries, the overall coverage of 72% (55%–96%) appears to be approaching universal access.

There has been substantial progress in Eastern Europe and Central Asia, where 35 000 (33 000–37 000) people are now receiving treatment, compared to 15 000 at the end of 2003. It is estimated that coverage in this region amounts to 15% (11%–22%) of those in need.

North Africa and the Middle East constitute the region with the lowest estimated coverage (6% (4%–12%)) with only 5 000 (4000–6000) of the 77 000 (43 000–130 000) people in need estimated to be receiving treatment at the end of 2006.

Funding provided by the United States President's Emergency Plan for AIDS Relief was supporting programmes treating 987 000 people at the end of 2006. Programmes supported by the Global Fund to Fight AIDS, Tuberculosis and Malaria were providing treatment to 770 000 people. However, approximately 492 000 people were receiving treatment through programmes jointly financed by the two initiatives, which, together, were therefore supporting treatment for 1 265 000 people.

Of the 2.3 million (1.7–3.5 million) children aged 0–14 years living with HIV in 2006, almost 90% of them in sub-Saharan Africa, about 780 000 (600 000–1 000 000) were estimated to be in need of antiretroviral therapy. **It is estimated that 115 500 (103 000–128 000) children had access to treatment by the end of 2006, representing a coverage rate of about 15% (12%–19%).** Thus, in comparison with UNICEF estimates of about 75 000 children on treatment in 2005, there has been a 50% increase in the number receiving treatment during the last year. However, coverage for children still lags behind the total estimated antiretroviral treatment coverage of 28% (24%–34%) in low- and middle-income countries. Despite recent improvements, sub-Saharan Africa has the lowest treatment coverage for children of any region.

Although trends vary between countries, the current evidence from over 50 low- and middle-income countries suggests that, overall, **the ratio of men to women receiving treatment is broadly in line with regional HIV prevalence sex ratios.**

Information on access to antiretroviral treatment by IDUs in 2004 is available for 50 low- and middle-income countries. Approximately 34 000 former or current IDUs were receiving antiretroviral therapy by the end of 2004, of whom around 30 000 were in Brazil. In Eastern Europe and Central Asia, where nearly 83% of HIV cases are attributed to injecting drug use, former or current IDUs represented 24% of the people on highly active antiretroviral treatment at the end of 2004. **Overall, IDUs continue to have poor and inequitable access to antiretroviral treatment,** particularly in Eastern Europe.

An analysis of prices conducted by the Global Price Reporting Mechanism for Antiretroviral Drugs at WHO shows that, depending on the regimen, **the prices of most first-line antiretroviral drugs decreased by between 37% and 53% in low- and middle-income countries from 2003 to 2006, and by between 10% and 20% from 2005 to 2006.** This has contributed significantly to the wider availability of treatment but prices remain high in most Eastern European and Latin American countries. With some exceptions in certain low-income countries the average prices paid for second-line regimens remain unaffordably high in low- and middle-income countries, where few or no prequalified generic alternatives are available.

Although the data are still relatively limited, there is evidence that, overall, the virological and immunological responses to treatment in both adults and children in resource-limited countries can be as good as those in industrialized settings if a public health approach to scale-up is adopted. Improvements in the quality of life are also being reported. Nevertheless, many countries have reported high death rates before the development of AIDS and a high risk of death in people with very low CD4 cell counts. This is mostly attributable to late diagnosis of HIV infection and late initiation of treatment. The long-term impact of treatment on prevention and risk behaviours in resource-limited settings has not yet been well documented, although early studies have shown no evidence of sexual behavioural disinhibition resulting from the availability of treatment.

Preventing HIV transmission from mother to child

Pregnant women with HIV are at risk of transmitting HIV to their infants during pregnancy, birth or breast-feeding. Without any interventions, between 20% and 45% of infants may become infected.

Of the estimated 2.3 million (1.7–3.5 million) children aged under 15 years living with HIV, well over 90% are thought to have become infected through mother-to-child transmission. Despite numerous statements of political commitment, a well-defined set of interventions and the know-how required for implementing them, the vast majority of pregnant women in need of PMTCT services are not receiving them. **In 2005, only about 220 000 of the more than 2 million pregnant women estimated to be living with HIV received antiretroviral prophylaxis for PMTCT, representing an estimated coverage rate of 11% (8%–16%).**

Over 85% of HIV-infected pregnant women live in sub-Saharan Africa. The 10 countries with the highest numbers of HIV-infected pregnant women account for two-thirds of women requiring PMTCT interventions in low- and middle-income countries and, except for India, are in this region. The coverage of antiretroviral prophylaxis is still relatively low in these 10 countries; only in South Africa is such prophylaxis being received by more than 25% of the pregnant women who are estimated to be HIV-infected.

Data obtained in 2005 from countries in sub-Saharan Africa indicate that the proportion of HIV-infected pregnant women receiving antiretroviral prophylaxis varied from below 1% to 54%, and that the overall regional coverage was 11% (8%–15%). The corresponding estimated values were 75% (38%–95%) for Eastern Europe and Central Asia, 24% (13%–46%) for Latin America and the Caribbean, 5% (3%–10%) for East, South and South-East Asia, and less than 1% for North Africa and the Middle East.

More than 100 countries have established PMTCT programmes but most of these have not been scaled up to meet the need for services. The most recent data from 2005 show that only seven countries provide antiretroviral prophylaxis to 40% or more of HIV-infected pregnant women.

HIV testing and counselling

Surveys in heavily affected countries have shown that knowledge of HIV status is limited. The available data suggest that **the global coverage of HIV testing and counselling remains unsatisfactorily low.** Demographic and health surveys in 12 high-burden countries accounting for 47% of adults and children living with HIV/AIDS in sub-Saharan Africa in 2005 showed that, among the general population, the median percentages of men and women who had been tested for HIV and had received the results were 12% and 10% respectively.

Data on the number of people living with HIV/AIDS who know their HIV-positive status is even more limited. Population-based surveys incorporating HIV tests undertaken in a small number of countries of sub-Saharan Africa revealed that the percentages of women living with HIV who knew their status before the surveys ranged between 12% and 25%, and that the corresponding values for men ranged between 8% and 24%.

In more than 70 surveyed low- and middle-income countries that reported data for 2005, only 10% of pregnant woman had received an HIV test. Testing coverage in pregnant women is low in several of the 10 countries with the highest estimated numbers of HIV-infected pregnant women.

There are data suggesting a threefold increase in both HIV testing of TB patients and the detection of HIV/TB coinfection since 2003. Nevertheless, in 2005, only 7% of TB patients were tested for HIV worldwide, and countries with a generalized HIV epidemic reported that only 13% of all TB patients were tested for HIV. Globally, 86% of the estimated number of HIV-positive TB patients are not tested for HIV during their treatment. Provider-initiated HIV testing and counselling is emerging as an important strategy for expanding access to HIV/AIDS treatment and care for TB patients.

Interventions for injecting drug users

Estimates from 94 reporting low- and middle-income countries suggest that the proportion of IDUs receiving some type of prevention service increased from just over 4% in 2003 to 8% in 2005. Nevertheless, **the coverage of prevention interventions for IDUs is still very low in comparison with the size of the global IDU population, which, in 2003, was estimated to be approximately 13.2 million.**

Substitution therapy was legal in 16 countries of Eastern Europe and Central Asia in 2005. Data on the number of patients on substitution therapy were found for 14 countries, among which coverage ranged from 0.9% to 1.1% of IDUs.

In 2005, 10 countries/territories in South and South-East Asia and three in East Asia and the Pacific had at least one dedicated needle and syringe exchange programme, and opioid substitution therapy was legal in China, India, Indonesia, the Islamic Republic of Iran, Malaysia, Myanmar, Nepal, Singapore, and Thailand.

Little is known about needle and syringe exchange and opioid substitution therapy in the Middle East, North Africa and sub-Saharan Africa. In Latin America and the Caribbean, information was found on needle and syringe exchange in Argentina, Brazil, Puerto Rico and Uruguay; in Mexico there is a methadone maintenance therapy programme.

The control of sexually transmitted infections to prevent HIV transmission

Evidence accumulated over the past two decades points to a strong association between STIs, particularly genital ulcer diseases (GUDs), and increased risk for the sexual transmission of HIV. To prevent the morbidity of STIs and to decrease HIV incidence, many approaches to preventing and controlling STIs have been implemented and proven efficacious. The prevalence of certain major STIs (e.g. chancroid, syphilis, and gonorrhoea) has fallen in many parts of the world. Simultaneously, however, there appears to have been an absolute increase in the incidence of herpes simplex virus type 2 (HSV-2) infection, which has become the predominant cause of GUDs.

STI prevention and care services contribute to the achievement of universal access to HIV prevention, care and treatment by promoting correct and consistent use of condoms, behavioural change, the empowerment of vulnerable populations, and STI management itself. While there is a need to scale up STI services, screening and education for symptom recognition must also be improved.

Surveillance of the HIV/AIDS epidemic

The data provided by HIV surveillance systems have been vital for advocacy and policy decisions, including the targeting of prevention interventions and providing realistic estimates of care and treatment needs. In 2000, UNAIDS and WHO launched the HIV second-generation surveillance methodology for improving HIV surveillance. This strategy promotes the adaptation of information systems to the epidemic characteristics of specific countries and links different sources of information, including data on sexual behaviour and HIV prevalence. Most countries have adopted this approach, although quality and trends have varied over time in different places.

By 2006, 44 countries had fully implemented surveillance systems, 42 had partially implemented such systems and 46 had systems that were performing poorly relative to the recommendations made by the UNAIDS/WHO Working Group on Global HIV/AIDS and STI Surveillance. This represents a slight increase in the quality of surveillance systems globally over the last few years.

Concerns about the representativeness of surveillance sites and the accuracy of national HIV estimates derived from antenatal clinic surveillance have led to an increased demand for population-based surveys that collect data on the prevalence and distribution of HIV in whole populations. The combination of different sources of data yields more accurate estimates of HIV prevalence; this approach is used by WHO and UNAIDS to regularly update HIV

country estimates. Further refinements in data collection, analysis and reporting could further improve the assessment of the status and trends of the AIDS epidemic in countries and regions.

Progress in setting targets for universal access

In the political declaration issued at the High-Level Meeting of the UN General Assembly in June 2006, countries committed themselves to developing ambitious targets for universal access. By the end of 2006, 90 countries had provided target data on the outcome indicators proposed by UNAIDS in its operational guidance on target-setting for such access. Of these 90 countries, **81 had set treatment targets and 84 had set outcome targets for at least one prevention intervention.**

Although countries committed themselves to setting targets by the end of 2006, many targets are still awaiting formal endorsement by national authorities, and some low-prevalence countries have only just begun the target-setting process. In addition, the necessary alignment and integration of target-setting with national planning processes means that a number of countries will continue this process during the course of 2007.

Major challenges ahead

1. Access to treatment continues to expand but significant obstacles to achieving universal access must be overcome

- Universal access by 2010 will require a steep increase in the number of people starting treatment every year.
- Higher priority must be given to promoting, monitoring and evaluating equity in access to services, including that for IDUs and other marginalized groups.
- Progress in preventing, diagnosing and treating HIV disease in children is still lagging far behind.
- There is an urgent need for new approaches to service delivery which will help to strengthen health systems.
- Treatment and prevention services must be scaled up in parallel.
- Concerns about financial sustainability in the longer term are hindering progress.
- Monitoring the benefits and impact of treatment are critical for ensuring continued international commitment.

2. The health sector must increase its efforts to improve access to prevention services for most-at-risk populations and people living with HIV/AIDS

- More effective outreach by the health sector to most-at-risk populations is urgently needed.
- The prevention needs of people living with HIV/AIDS must be addressed.

3. A concerted global effort is needed to accelerate the scale-up of comprehensive PMTCT interventions

- Comprehensive PMTCT services are lacking in most low- and middle-income countries.
- The available guidance and know-how on PMTCT should now be translated into action.

4. Infection control in health settings must be strengthened

- Both HIV and TB should be more effectively addressed through comprehensive infection control strategies in health care settings.

5. A range of strategies is needed to increase knowledge of HIV status

- Continued scale-up of VCT services is necessary but obstacles to uptake must be overcome.
- The health sector should expand its role in HIV testing and counselling.

6. The quality and breadth of strategic information needs improvement

- Weak monitoring and evaluation systems are an obstacle to increased funding and more effective implementation.
- Ambitious national targets and standards are needed to further mobilize action and increase accountability.
- Greater investment in operational research will help to increase the impacts of programmes.

7. Male circumcision services should be recognized as an important intervention to reduce the risk of HIV infection

8. Tuberculosis presents major threats and opportunities for the response to HIV/AIDS

- The emergence of extensively drug-resistant tuberculosis (XDR-TB) in settings of high HIV prevalence, notably in southern Africa, is a serious threat to public health.
- Overall efforts to ensure that people living with HIV/AIDS have adequate access to high-quality TB prevention, diagnostic and treatment services are insufficient.
- Prioritizing access to high-quality TB prevention, diagnostic and treatment services will prevent the development and spread of drug-resistant TB and prolong the quality and quantity of life for people living with HIV/AIDS.
- TB and HIV/AIDS programmes are increasingly collaborating to overcome the health system barriers to achieving their common goals, but opportunities are still being missed.

1. INTRODUCTION

At the June 2006 General Assembly High-Level Meeting on HIV/AIDS, United Nations Member States agreed to work towards the goal of “universal access to comprehensive prevention programmes, treatment, care and support” by 2010.

This goal calls for the international community to further build on the progress made in the global response to HIV/AIDS in recent years through, for example, the WHO/UNAIDS “3 by 5” initiative and the increased resources made available to countries by the Global Fund to Fight AIDS, TB and Malaria, the World Bank, the United States President’s Emergency Plan for AIDS Relief and other bilateral efforts, as well as by private foundations and nongovernmental organizations.

The “3 by 5” initiative highlighted the value of target-setting in driving important public health initiatives and the need for simplified and standardized approaches to service delivery in many low-income settings. It also revealed various significant obstacles to the further scale-up of HIV prevention, treatment and care, among them strained human resource capacity, weak laboratory and other health infrastructures, constraints in supply systems for drugs, diagnostics and other commodities, inadequate integration of HIV services into the health care system, and a lack of standardized systems for monitoring and evaluating progress. The expansion of access to health services for most-at-risk populations is also a major challenge.

For these reasons, WHO, as the UNAIDS cosponsor responsible for the health sector response in the context of scaling up access to HIV prevention, treatment, care and support, has established priorities for supporting countries on the basis of the following five Strategic Directions, each of which represents a critical area where the health sector must invest if countries are to make significant progress.¹

1. Enabling people to know their HIV status.
2. Maximizing the health sector’s contribution to HIV prevention.
3. Accelerating the scale-up of HIV/AIDS treatment and care.
4. Strengthening and expanding health systems.
5. Investing in strategic information to guide a more effective response.

The latter Strategic Direction recognizes that improving strategic information and knowledge of the epidemic at the local and national levels is essential to guide planning, decision-making, implementation and accountability in relation to the response of the health sector to HIV/AIDS. As WHO Director-General Margaret Chan observed upon taking office in January 2007, “What gets measured, gets done.”²

WHO has undertaken to monitor and evaluate the global health sector response in scaling up towards universal access and to produce annual reports on this matter.³ The present document is the first such report.

1 WHO. *Towards universal access by 2010: how WHO is working with countries to scale up HIV prevention, treatment, care and support*. Geneva: WHO; 2006.

2 Dr Margaret Chan, Director-General of the World Health Organization, Address to WHO staff, 4 January 2007, accessed at: <http://www.who.int/dg/speeches/2007/address.to.staff/en/index.html>

3 WHO. *WHO’s contribution to universal access to HIV/AIDS prevention, treatment, care: report by the Secretariat*. Geneva: WHO; 2006 (World Health Assembly document A59/39).

Box 1. WHO framework for monitoring progress towards universal access

The framework that WHO will use to monitor progress towards universal access to HIV/AIDS prevention, treatment and care in the health sector has the following aims.

- To build on ongoing international efforts such as the monitoring of the 2001 United Nations General Assembly Special Session (UNGASS) Declaration and the monitoring process for the Millennium Development Goals (MDGs).
- To promote country-specific target-setting around a small number of indicators.
- To take responsibility for annual monitoring of the health sector's progress towards universal access in the context of the broad UN effort, while aiming to minimize the burden of reporting on countries.
- To promote investment in the strengthening of data collection and analysis in countries so as to assess and inform progress towards universal access.

"Access" is a broad concept, which, measures three dimensions of key health sector interventions:

- **Availability**, defined in terms of the reachability (physical access), affordability (economic access) and acceptability (sociocultural access) of services that meet a minimum standard of quality.⁴ Making services available, affordable and acceptable is an essential precondition for universal access.
- **Coverage**, defined as the proportion of a population needing an intervention who receive it. Coverage is influenced by supply (provision of services) and by demand from people in need of services.
- **Impact**, defined as reduced new infection rates or as improvements in survival. It results from the coverage of services, modulated by the efficiency and effectiveness of interventions and changes in other relevant factors. Impact goals have been set in the context of the MDGs.

These three elements will be reflected in WHO's work with countries on universal access and will be addressed, as far as possible, in the global reports on progress towards universal access in the health sector.

Building on the "3 by 5" progress reports published by WHO and UNAIDS in 2004, 2005 and 2006, Section 2 of this report addresses progress in scaling up the following health sector interventions:

- antiretroviral therapy;
- prevention of mother-to-child HIV transmission;
- HIV testing and counselling;
- interventions for injecting drug users;
- control of sexually transmitted infections to prevent HIV transmission;
- surveillance of the HIV/AIDS epidemic.

The data presented focus on the coverage and impact of interventions. New estimates are included of the number of people receiving antiretroviral treatment at the global and regional levels as of December 2006. For the other interventions shown, the report provides available baseline data drawn from a variety of sources, including a survey of WHO country offices conducted in the third quarter of 2006. Progress in setting country-level targets is also discussed.

Section 3 provides conclusions arising from the data and indicates steps that must be taken in the key intervention areas so as to accelerate progress towards universal access.

⁴ "Access", "utilization", "availability" and "coverage" are often used interchangeably to indicate whether people in need of something for their health are actually getting it. See, e.g. Tanahashi T. Health services coverage and its evaluation. *Bulletin of the World Health Organization* 1978; 56:295-303.

Section 4 highlights progress to date and key challenges in scaling up priority health sector interventions for HIV/AIDS in seven countries that have a particularly high burden of HIV.

From 2008 onwards the reports will provide data on the scale-up of other selected interventions, including prevention for at-risk populations such as sex workers, men who have sex with men, and prisoners. Progress in strengthening key components of health systems will also be addressed, including the integration of HIV/AIDS interventions into other health services, such as those for TB, reproductive health and maternal and child health. Future reports will also consider human resources, drug procurement and supply management systems, health information systems, blood safety, and approaches to health financing.

2. SUMMARY OF GLOBAL PROGRESS IN PRIORITY INTERVENTION AREAS

2.1 Antiretroviral therapy

2.1.1 Coverage and availability of services

Encouraging global trends in the scale-up of antiretroviral treatment have continued. In December 2003, when WHO and UNAIDS launched the “3 by 5” strategy, around 400 000 people were receiving antiretroviral therapy in low- and middle-income countries. Since then, increasing efforts by countries, supported by multilateral and bilateral partners, have resulted in a significant increase in the number of people receiving antiretroviral therapy. In 2006 almost 700 000 people received treatment for the first time. It was estimated that by December 2006 some 2 015 000 people living with HIV/AIDS (1.8–2.2 million) were receiving treatment in low- and middle-income countries (Table 1), representing 28% (24%–34%) of the 7.1 million (6.0–8.4 million) estimated to be in need.

It is estimated that more than 1.3 million people in sub-Saharan Africa are receiving antiretroviral treatment, with coverage of 28% (24%–33%), whereas three years ago only 100 000 were on treatment and coverage was only 2%. Of the people now receiving antiretroviral treatment in low- and middle-income countries, 67% live in sub-Saharan Africa, whereas the corresponding figure in late 2003 was only 25%. This region also accounts for two-thirds of the total treatment need in such countries.

In East, South and South-East Asia, 280 000 people are on treatment (225 000–335 000) and coverage is estimated at 19% (13%–28%), representing an approximately fourfold increase from the 70 000 people receiving treatment at the end of 2003. Although Asia has 21% (17%–25%) of global treatment need, it has only 14% (13%–15%) of people on treatment in low- and middle-income countries.

In Latin America and the Caribbean the number of people receiving treatment has increased gradually from 210 000 at the end of 2003 to 355 000 (315 000–395 000). While there are considerable variations between countries, the overall coverage of 72% (55%–96%) appears to be approaching universal access. However, coverage declined slightly between June and December 2006, suggesting that the increase in estimated need has not been matched by an equivalent increase in the number of people being treated.

There has been substantial progress in Eastern Europe and Central Asia: 35 000 people are receiving treatment (range 33 000–37 000), whereas at the end of 2003 only 15 000 were doing so. Coverage is estimated to be 15% (11%–22%) of those in need. Eastern Europe and Central Asia represent 3.2% of the estimated total treatment need (2.7%–3.8%) and approximately 2% of those reported to be on treatment (1.5%–1.7%).

At 6% (4%–12%), coverage in North Africa and the Middle East is the lowest: it was estimated that only 5000 people were receiving treatment at the end of December 2006 (4000–6000) while 77 000 were in need (43 000–130 000). Progress in this region will largely depend on scale-up in Sudan, which accounts for more than 85% of treatment need but has only 1% coverage.

Table 1. Estimated numbers of people receiving and needing antiretroviral therapy, and percentage coverage in low- and middle-income countries according to region, December 2003 to December 2006^a

Geographical region	Estimated number of people receiving antiretroviral therapy, December 2006 (range) ^b	Estimated number of people needing antiretroviral therapy, 2006 (range) ^b	Antiretroviral therapy coverage, December 2006 (range) ^c	Estimated number of people receiving antiretroviral therapy, December 2005 (range) ^b	Estimated number of people receiving antiretroviral therapy, December 2003 (range) ^b
Sub-Saharan Africa	1 340 000 [1 220 000–1 460 000]	4 800 000 [4 100 000–5 600 000]	28% [24–33%]	810 000 [730 000–890 000]	100 000 [75 000–125 000]
Latin America and the Caribbean	355 000 [315 000–395 000]	490 000 [370 000–640 000]	72% [55–96%]	315 000 [295 000–335 000]	210 000 [160 000–260 000]
East, South and South-East Asia	280 000 [225 000–335 000]	1 500 000 [1 000 000–2 100 000]	19% [13–28%]	180 000 [150 000–210 000]	70 000 [52 000–88 000]
Europe and Central Asia	35 000 [33 000–37 000]	230 000 [160 000–320 000]	15% [11–22%]	21 000 [20 000–22 000]	15 000 [11 000–19 000]
North Africa and the Middle East	5 000 [4 000–6 000]	77 000 [43 000–130 000]	6% [4–12%]	4 000 [3 000–5 000]	1 000 [750–1 250]
TOTAL	2 015 000 [1 795 000–2 235 000]	7 100 000 [6 000 000–8 400 000]	28% [24–34%]	1 330 000 [1 200 000–1 460 000]	400 000 [300 000–500 000]

Note: some numbers do not add up due to rounding.

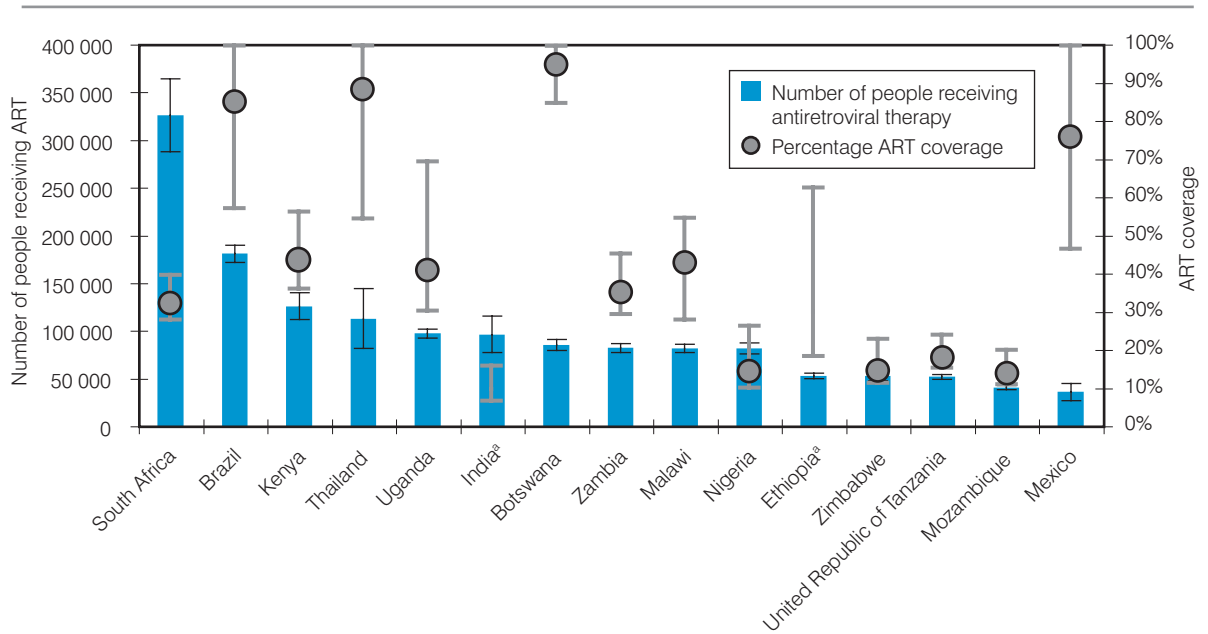
a See Annexes 1 and 2 for an explanation of the methods used.

b Data on children - when available - are included.

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

At the end of 2006, 15 countries accounted for almost 75% of over 2 million people receiving treatment in low- and middle-income countries (Fig. 1), and for about 70% of the total need. Although some of these countries substantially increased the number of people receiving treatment in 2006, coverage in most of them remains well below the estimated need. Coverage has surpassed 80% in three of them (Botswana, Brazil, and Thailand), whereas in India, Mozambique, Nigeria, the United Republic of Tanzania, and Zimbabwe it is below the average for low- and middle-income countries (28%, including adults and children).

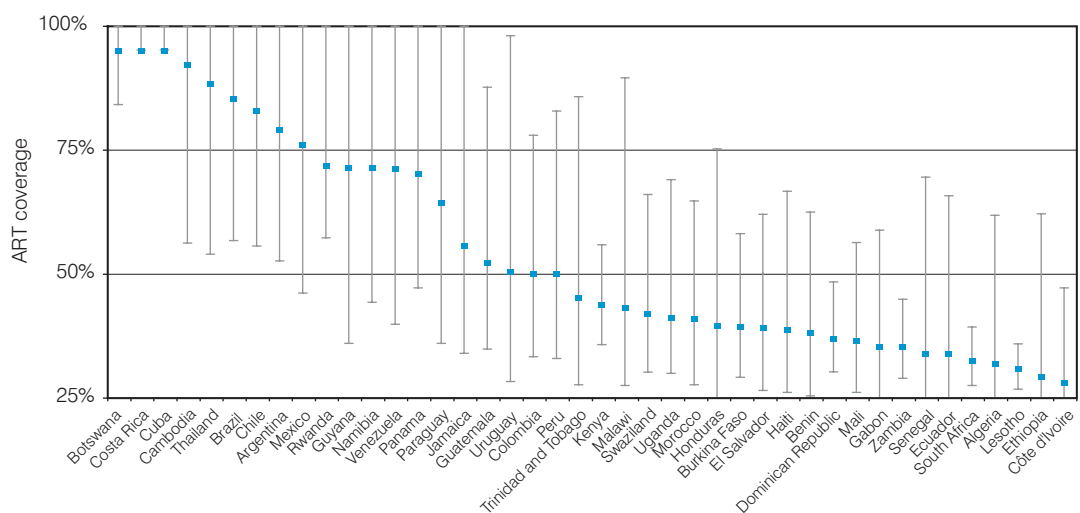
Fig. 1. Fifteen low- and middle- income countries with the highest estimated number of people receiving antiretroviral therapy, and corresponding estimated antiretroviral therapy coverage, December 2006



a The estimated ART coverage is currently under review and will be adjusted, as appropriate, based on new data collected during 2006. Preliminary analysis suggests that numbers lie within these ranges.
 I The bar indicates the uncertainty range around the estimate.

By the end of 2006, 42 low- and middle-income countries were providing treatment to at least 28% of those in need. Twenty of these countries had achieved coverage of at least 50% of those in need (Fig. 2). Annex 1 shows individual country data for 193 countries, including, for the first time, separate data on high-income countries.

Fig. 2. Estimated antiretroviral therapy coverage of at least 28% in low- and middle-income countries, December 2006^a



a 28% is the overall ART coverage for low- and middle-income countries. Only countries with an estimated ART need of at least 1000 are included in this graph.
 I The bar indicates the uncertainty range around the estimate.

It is estimated that more than 600 000 people are receiving antiretroviral therapy in high-income countries. However, determining the precise number is difficult because many people access treatment through private providers and treatment data are not systematically collected by all countries.

The United States President's Emergency Plan for AIDS Relief and the Global Fund to Fight AIDS, Tuberculosis and Malaria are major funders of antiretroviral treatment programmes in low- and middle-income countries. The Emergency Plan is involved in over 120 countries and places special emphasis on 15 countries in Africa, Asia and the Caribbean. The Global Fund supports HIV/AIDS programmes focusing on antiretroviral therapy in over 100 countries. At the end of 2006 the Emergency Plan was supporting programmes treating 987 000 people. Programmes supported by the Global Fund were providing treatment to 770 000 people. However, approximately 492 000 people were receiving treatment through programmes jointly financed by the two initiatives, which were therefore supporting the treatment of 1 265 000 people in total.

2.1.2 Equity of access to treatment: women, children and injecting drug users

Paediatric HIV disease has been virtually eliminated in high-income countries, where the ready availability of HIV prevention and treatment services has lowered the rate of mother-to-child transmission to less than 2% and has boosted the survival rates of HIV-infected infants, of whom more than 80% now live beyond the age of 6 years.⁵

The progression of untreated HIV disease in **children** is particularly aggressive. In 2006 it was estimated that 380 000 children under 15 years of age (290 000–500 000) died of AIDS-related causes.⁶ The vast majority of these deaths occurred in low- and middle-income countries and were preventable by treating or preventing opportunistic infections with co-trimoxazole and antiretrovirals.

WHO recommends that co-trimoxazole be given to children with HIV as well as to children born to HIV-infected mothers if early diagnosis of HIV infection in children is impossible. Estimates put the number of HIV-exposed and HIV-infected children in 2005 at about 4 million. UNICEF, WHO and partners estimated that, in 2005, co-trimoxazole prophylaxis was given to only 4% of the children needing it.⁷

Of the 2.3 million children aged 0–14 years living with HIV in 2006 (1.7–3.5 million), almost 90% of them in sub-Saharan Africa, about 780 000 (600 000–1 000 000) were estimated to be in need of antiretroviral therapy (Table 2). This represents 11% of the total need for antiretroviral therapy (all ages). It is estimated that 115 500 (103 000–128 000) children had access to treatment by the end of 2006, representing coverage of about 15% (12%–19%).⁸ Compared to estimates for 2005 of about 75 000 children on treatment,⁹ there has been a 50% increase in the number of children receiving treatment in the last year. However, coverage for children still lags behind the total estimated antiretroviral treatment coverage of 28% (24%–34%) in low- and middle-income countries.

Although there has been a 40% increase in the number of children receiving antiretroviral treatment in sub-Saharan Africa in the last year, access to treatment for children in this region is quite low in comparison with adult access; the overall percentage of people on treatment who are children is 6%, this being far below the percentage of people in need of treatment who are children (14%). In other regions there is no evidence of such inequity. In Asia, children represent 4% of need and the percentage of people on treatment who are children is 5%. The corresponding values are 3% and 4% in Eastern Europe and Central Asia and 5% and 4% in Latin America.

5 WHO. *Taking stock: HIV in children*. Geneva: WHO; 2006 (WHO/HIV/2006.04).

6 UNAIDS/WHO. *AIDS epidemic update, December 2006*. Geneva: UNAIDS/WHO; 2006.

7 UNICEF/UNAIDS/WHO. *Children and AIDS: a stocktaking report*. UNICEF, UNAIDS, WHO; 2007.

8 Based on data from 96 countries, for 25 of which there are data for 2005, the others having data for 2006. These 96 countries represent almost 98% of the total child treatment need in 2006.

9 Op. Cit.

Table 2. Estimated numbers of children aged under 15 years receiving and needing antiretroviral therapy and percentage coverage in low- and middle-income countries according to region, December 2006^a

Geographical region	Estimated number of children receiving antiretroviral therapy (range) ^{b,c}	Estimated number of children needing antiretroviral therapy (range) ^c	Antiretroviral therapy coverage (range) ^d
Sub-Saharan Africa	85 000 [77 000–93 000]	680 000 [510 000–890 000]	13% [10%–17%]
Latin America and the Caribbean	15 500 [13 750–17 250]	23 000 [16 000–37 000]	67% [42%–97%]
East, South and South-East Asia	13 300 [10 600–16 000]	64 000 [32 000–120 000]	21% [11%–42%]
Europe and Central Asia	1 500 [1 400–1 600]	7 500 [3 800–14 000]	20% [11%–39%]
North Africa and the Middle East	<100 [<200]	10 000 [4 400–20 000]	<1% [0%–1%]
Total	115 500 [103 000–128 000]	780 000 [600 000–1 000 000]	15% [12%–19%]

Note: Some numbers do not add up due to rounding.

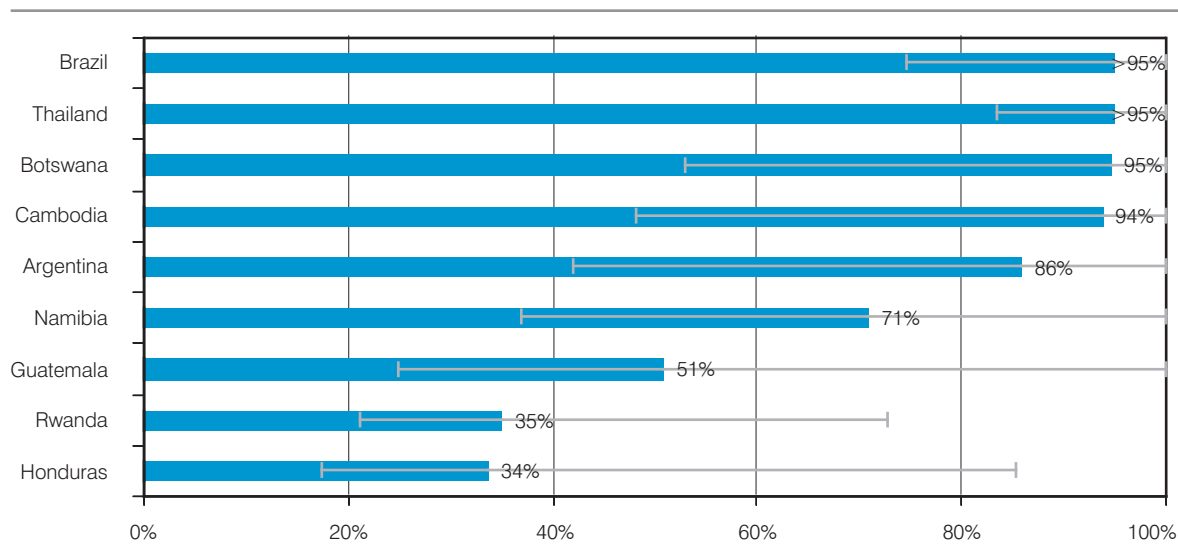
a See Annexes 1 and 2 for an explanation of the methods used.

b Estimates are calculated on the basis of growth between December 2005 (UNICEF/WHO/UNAIDS. Children and AIDS: A stocktaking report, 2007) and 2006, presented in this report (WHO/UNAIDS/UNICEF); 25 values were for 2005, the remainder for 2006.

c See Annex 2 for country-specific data on children receiving and needing ART.

d Based on the estimated numbers of children receiving and needing antiretroviral therapy.

Fig. 3. Low- and middle income countries with antiretroviral therapy coverages of at least 25% among children aged under 15 years, 2006^a



a Only countries with an ART need among children of at least 1000 are included in this graph.

— The bar indicates the uncertainty range around the estimate.

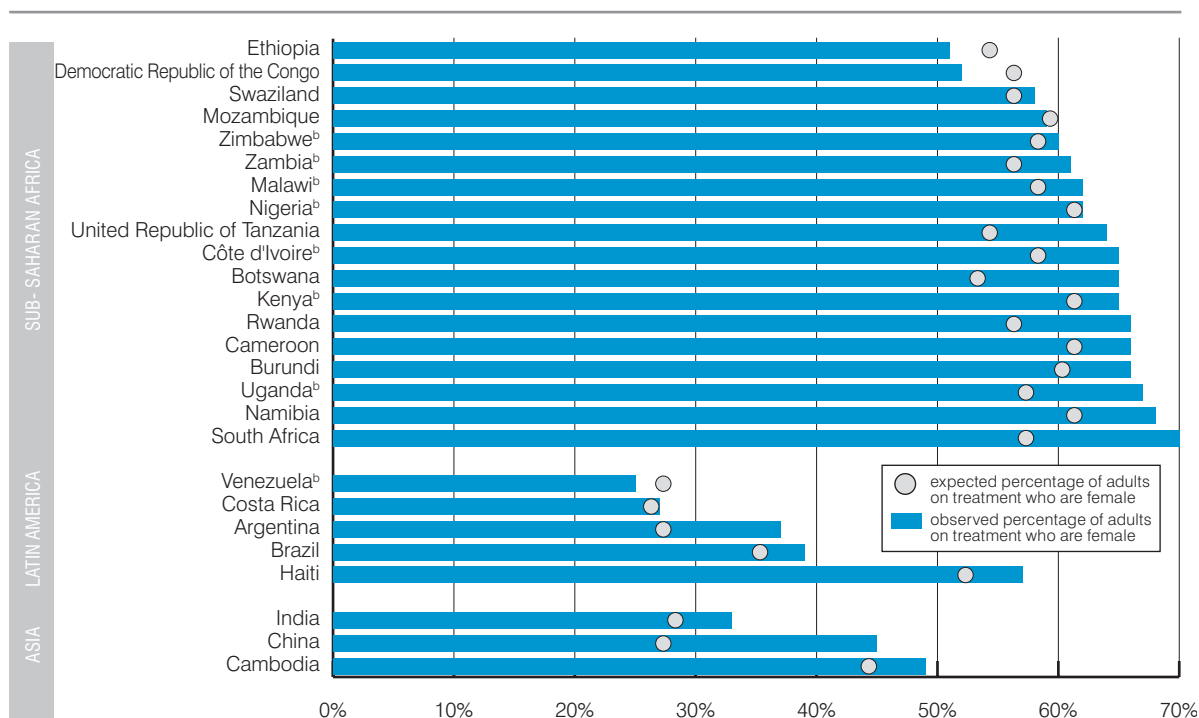
Only five low- and middle-income countries with large numbers of children in need of treatment (Argentina, Botswana, Brazil, Cambodia, and Thailand) have antiretroviral treatment coverage for children higher than 80% (Fig. 3).¹⁰

¹⁰ Data on the number of children on treatment is not disaggregated by age and may reflect a bias towards older children, in whom HIV can be diagnosed with rapid testing technology, rather than towards infants, for whom HIV diagnosis remains a challenge.

Several countries with the highest burdens of HIV have very low treatment coverage for children. Nigeria has approximately 100 000 children in need of treatment (44 000–170 000) but only 3% (2%–8%) were estimated to be receiving it by September 2006. In India, between 17 000 and 94 000 children are in need of treatment but coverage is only between 3% and 19%. In Zimbabwe there are 45 000 children in need of treatment (18 000–85 000), whereas coverage is estimated to be about 6% (3%–14%). South Africa, with a child treatment need of 86 000 (43 000–130 000), has coverage of 21% (14%–42%), the number of children receiving treatment having increased by 50% between December 2005 and September 2006.

Current evidence from over 50 low- and middle-income countries suggests that, overall, the ratio of men to **women** receiving treatment is broadly in line with regional HIV prevalence sex ratios. Approximately 57% of adults receiving treatment in these countries are women, while women represent 48% (41%–57%) of adults living with HIV/AIDS. For sub-Saharan Africa the respective values are 64% and 59%, for Latin America and the Caribbean they are 39% and 34%, for Asia they are 39% and 32%, and for Eastern Europe and Central Asia they are 43% and 28% (Fig 4).

Fig. 4. Women as a percentage of all adults receiving antiretroviral therapy versus the expected percentage, selected countries, 2006^a



a The expected percentage of women receiving antiretroviral therapy is based on the percentage of people living with HIV/AIDS who are women. Values are sorted in ascending order within each region. This graph includes only countries with treatment data available by sex for at least 5000 adults. More country specific data can be found in Annex 2.

b Treatment data by sex are based on partial datasets and/or are not based on the most recent national level data. See Annex 2 for further details.

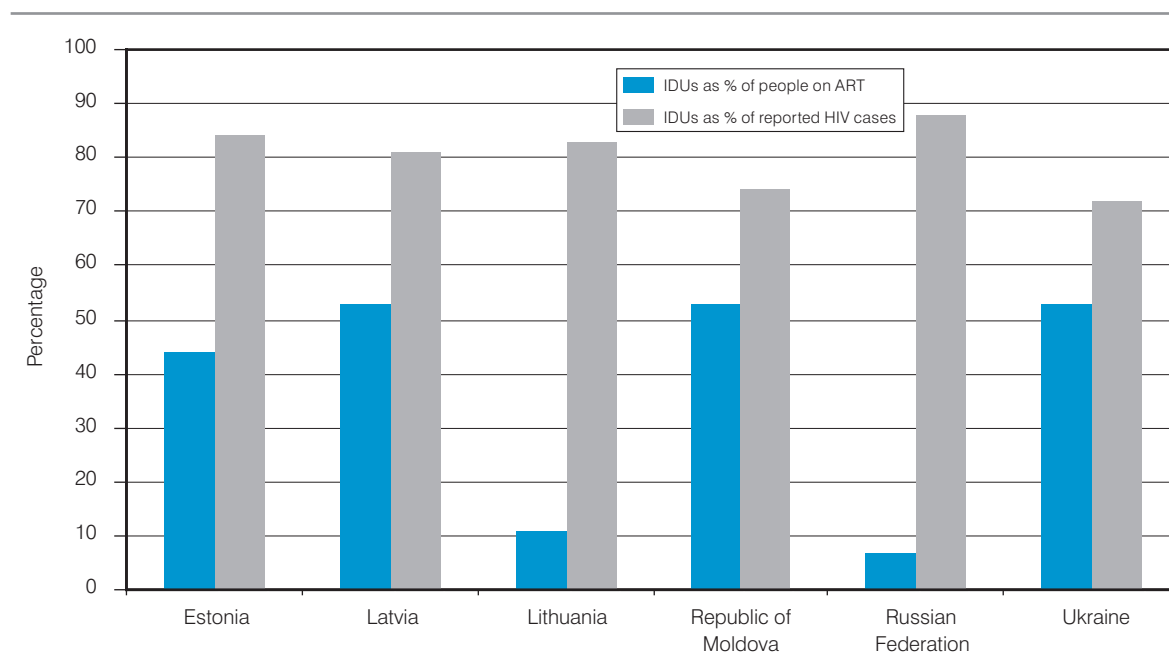
The picture may be different in certain countries. In Ghana, for example, more men may be receiving treatment than would be expected based on the sex ratio of people living with HIV/AIDS in this country: the percentage of women among adults receiving treatment is well below 55%, whereas women account for at least 55% of adults needing treatment. Conversely, in Botswana, Burundi, Cambodia, China, and South Africa women comprise a higher proportion of the adults receiving treatment than would be expected based on the percentage of people living with HIV/AIDS who are women. Evidence is still lacking to accurately explain the reasons for such differences among countries.

Equity of access to antiretroviral treatment should continue to be monitored through improved reporting of disaggregated data and through special studies in order to identify and eliminate gender bias where possible, to improve understanding of how and why individuals access treatment, and to assess potential differences in the quality of care and treatment outcomes for men and women.

A recent study on HIV responses by **injecting drug users** (IDUs) revealed that among 103 low- and middle-income countries reporting evidence of an IDU population, information about access to antiretroviral treatment by IDUs in 2004 was available in 50 countries.¹¹ Of these, 19 reported no access to ART for IDUs. In the remaining countries, approximately 34 000 former or current IDUs were receiving antiretroviral therapy by the end of 2004, of whom some 30 000 were in Brazil.

In Eastern Europe and Central Asia, where nearly 83% of HIV cases are attributed to injecting drug use, former or current IDUs represented 24% of the total number of people on highly active antiretroviral treatment at the end of 2004. IDUs in Eastern Europe have poor and inequitable access to ART, particularly in the Russian Federation (Fig. 5), which has the highest number of cases related to injecting drug use in the region.¹²

Fig. 5. Antiretroviral treatment access among injecting drug users (IDUs) in Eastern Europe, selected countries, 2004



11 Aceijas C, et al. Antiretroviral treatment for injecting drug users in developing and transitional countries one year before the end of the 'Treating 3 million by 2005. Making it happen. The WHO strategy' ('3 by 5'). *Addiction* 2006;101(9):1246-53.

12 Donoghoe M, et al. Access to highly active antiretroviral therapy (HAART) for injecting drug users in the European Region 2002–2004. *International Journal of Drug Policy*. Special Issue (in press).

In 14 countries of South and South-East Asia where information was available on access to antiretroviral therapy by IDUs, some 81 000 people were receiving such treatment at the end of 2004, of which 1700 were former or current IDUs. In India, where injecting drug use was the main factor in HIV transmission in the north-eastern states, IDUs represented 1.4% of all people receiving antiretroviral treatment. In China, where approximately 50% of HIV cases were associated with injecting drug use, IDUs represented less than 2% of the people on antiretroviral treatment.

Little information exists on the availability of antiretroviral treatment among IDUs in the Middle East and North Africa. Only Turkey reported data on IDUs receiving antiretroviral treatment. In Bahrain and the Libyan Arab Jamahiriya, which report a high number of HIV cases attributed to injecting drug use, no data were found on the number of IDUs receiving treatment. No information on treatment access for IDUs was available for countries of sub-Saharan Africa reporting HIV transmission through injecting drug use. In Latin America and the Caribbean, Brazil was the only country that provided data on IDUs receiving treatment: in 2004, 30 000 IDUs were receiving antiretroviral treatment, representing 19.5% of the people on such treatment.

Following the examples of Brazil and Senegal, some other countries, including Ethiopia, Kenya, Tanzania, and Zambia, have recently introduced the universal provision of **free antiretroviral drugs** at the point of service delivery in the public sector. Nigeria and the Congo recently announced that antiretroviral drugs would be delivered free of charge. Further consideration needs to be given to the obstacles presented by user fees for laboratory testing and for medications other than antiretroviral drugs.

2.1.3 Drug prices

The Global Price Reporting Mechanism (GPRM) on Antiretroviral Drugs, established in 2004, provides information on transaction prices of antiretrovirals purchased in developing countries.^{13,14,15} In low- and middle-income countries the prices of most first-line¹⁶ medications decreased by between 37% and 53% from 2003 to 2006 and by between 10% and 20% from 2005 to 2006. This has contributed significantly to the wider availability of treatment, but prices remain high in most countries of Eastern Europe and Latin America. The average prices paid for second-line regimens remain unaffordably high in low- and middle-income countries (with some exceptions in certain low-income countries), where few or no prequalified generic alternatives are available.

13 The value of the procurement transactions reported so far is US\$ 381 359 508 (including paediatric formulations).

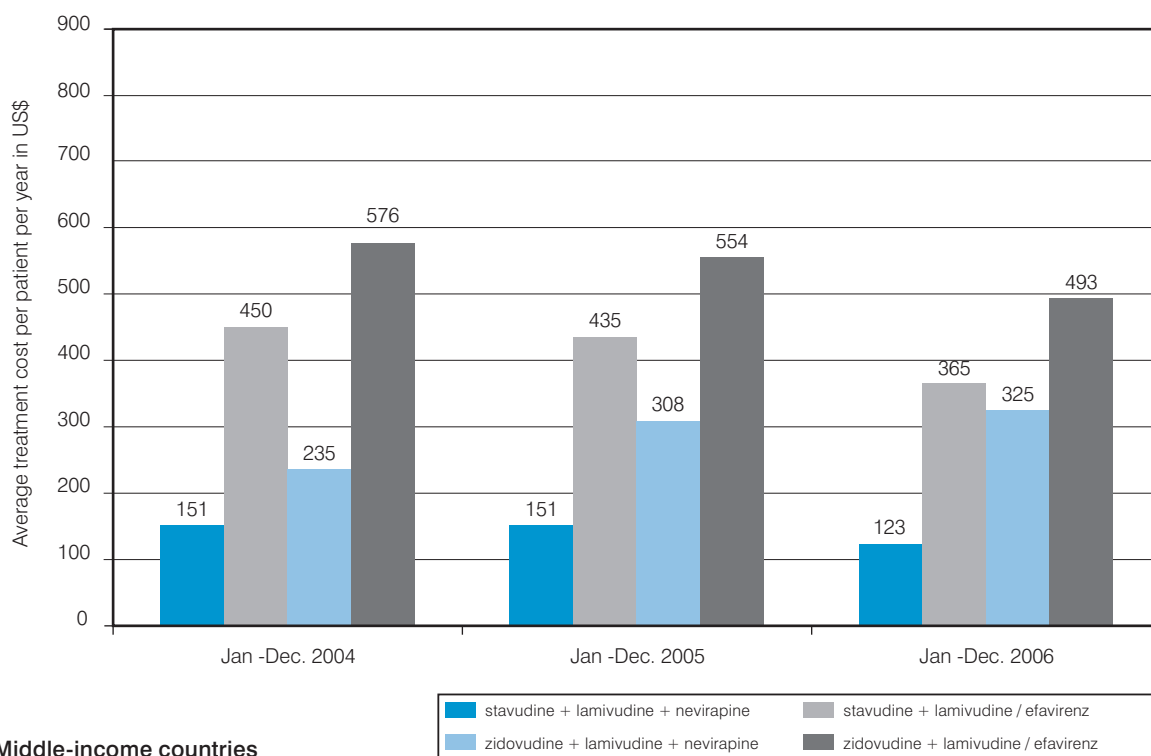
14 Global Price Reporting Mechanism, <http://www.who.int/hiv/amds/price/hdd/>

15 Summary report, Global Price Reporting Mechanism on Antiretroviral Drugs, August 2006, http://www.who.int/hiv/amds/grpm_aug06.pdf

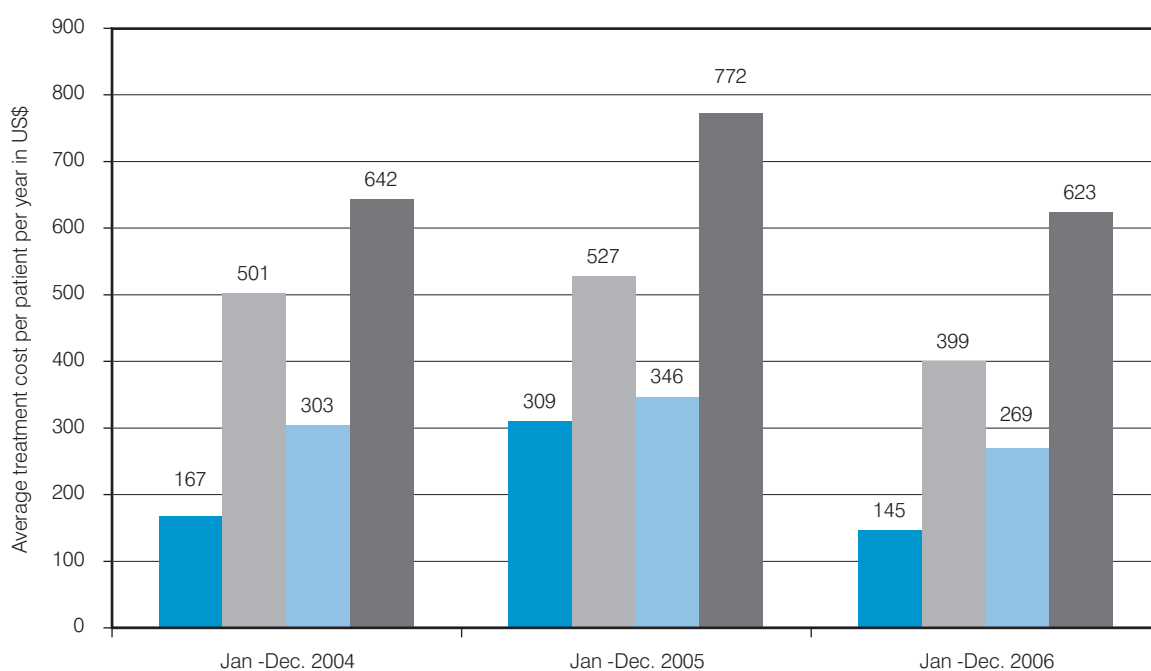
16 The combination of drugs taken when treatment begins in treatment-naïve patients. Second-line regimens are initiated when first-line treatment has failed because of the development of resistance to one or more drugs or because of toxicity or other factors.

Fig. 6. Trends in the cost of first-line antiretroviral therapy regimens in low- and middle-income countries, 2004-2006

Low-income countries



Middle-income countries



As shown in Fig. 6, the average price paid for first-line treatment (prequalified by WHO) in low-income countries in 2006 ranged from US\$ 123 per person per year for the fixed-dose combination of stavudine + lamivudine + nevirapine (the most widely used combination) to US\$ 493 for the fixed-dose combination zidovudine + lamivudine plus a single dose of efavirenz. Contrary to the general trend, the average price for zidovudine + lamivudine + nevirapine, the second-most frequently used combination, increased from US\$ 235 in 2004 to US\$ 325 in 2006. The weighted average price¹⁷ of the four most widely used combinations in first-line treatment (the above three and stavudine + lamivudine + efavirenz), representing 95% of the prescribed first-line treatments (in low- and middle-income countries), was US\$ 219 per person per year in 2006.

The fall in drug prices between 2004 and 2006 is attributable to the scale-up of treatment programmes, increased competition between a growing number of products prequalified by WHO, and negotiations between the William J. Clinton Foundation and major generic manufacturers.

In middle-income countries the average prices paid for first-line treatment have significantly decreased and are now closer to those paid in low-income countries. The average prices paid for such treatment in 2006 ranged from US\$ 145 per person per year for the cheapest regimen of stavudine + lamivudine + nevirapine to US\$ 623 per person per year for the most expensive regimen of zidovudine + lamivudine + efavirenz. In the same year the weighted average price of the four most widely used combinations in first-line treatment was US\$ 240 per person per year.

Second-line treatment is still significantly more expensive than first-line treatment in low- and middle-income countries. In 2006 the average cost of a regimen of didanosine + abacavir + lopinavir/ritonavir, the most commonly used second-line regimen (Box 2), was US\$ 1698 in low-income countries and US\$ 4735 in middle-income countries. The average cost of tenofovir + abacavir + lopinavir/ritonavir is US\$ 1572 per person per year in low-income countries and US\$ 4698 per person per year in middle-income countries. The actual prices paid for second-line regimens vary significantly between countries. For example, an average price of US\$ 1600 per person per year is paid by South Africa for tenofovir + abacavir + lopinavir/ritonavir, whereas El Salvador pays US\$ 7613 per person per year for the same regimen.

Box 2. WHO survey of antiretroviral drug use

A standardized WHO questionnaire on national antiretroviral drug use was answered by 23 highly affected countries in March/April 2006: 851 000 patients were receiving ARVs, representing 53% of patients on antiretroviral treatment in resource-limited countries; 92% of these patients were adults and 8% were children. Fifteen first-line regimens and 27 second-line regimens were being used: 96% of adults and 99% of children were on first-line treatments. In adults, 94% of the patients on first-line treatments received one of the four treatment regimens recommended by WHO, 61% receiving stavudine + lamivudine + nevirapine. In 13 countries which provided information on paediatric treatment, 97% of the children on first-line treatments received one of the four regimens recommended by WHO. While 4% of adults were reported to be on second-line regimens, information on specific regimens was reported for only 76% of this group. Sixty-one percent of the reported second-line regimens were consistent with the WHO treatment guidelines issued in 2006, 24% receiving abacavir + didanosine + lopinavir/ritonavir.¹⁸

¹⁷ The weighted average price is calculated by assigning to the price of each combination a weight that equals the proportion that the combination represents in the global volume of first-line regimens in low-income (and, respectively, middle-income) countries.

¹⁸ These findings are quite consistent with those of: Beck EJ, Vitoria M, Mandala S, Crowley S, Gilks CF, Souteyrand Y. National adult antiretroviral therapy guidelines in resource-limited countries: concordance with 2003 WHO guidelines? *AIDS* 2006;20(11):1497-502.

2.1.4 Treatment outcomes

The final progress report produced by WHO and UNAIDS during the “3 by 5” initiative described the increased survival of patients on antiretroviral treatment in low- and middle-income countries.¹⁹ However, except for Brazil, most available data are from small research studies or reports from nongovernmental organizations covering a short period or performed on a relatively small scale. Survival rates of up to 95% at one year and 94% at two years have been reported in research settings.²⁰ Further data are needed to establish whether such outcomes can be replicated in national AIDS programmes that are scaling up access to antiretroviral treatment by means of a public health approach.

Some countries are still struggling to collect and report accurate and complete data on current numbers of patients on treatment, and many have yet to look at treatment outcome data. In a few countries, e.g. Ethiopia, India, and South Africa, paper-based patient monitoring systems have been successfully introduced, enabling the collection and reporting of aggregate treatment cohort data on such matters as the proportions of patients alive, on treatment and remaining on first-line regimens. In five hospitals in Ethiopia, 12-month survival was approximately 90% for monthly cohorts who began treatment between September 2004 and January 2005.²¹ By June 2006 in India, 81% of patients who had started treatment in April 2004 were still on a first-line regimen, 8% were reported dead and 9% had been lost to follow-up at 12 months on treatment.²² By the same time in South Africa’s Western Cape, 78% of patients who had started treatment in 2001 were still on first-line regimens, 9% were reported dead and 6% had been lost to follow-up at 12 months on treatment; at 24 months, 74% remained on first-line regimens, 16% were reported dead and 3% had been lost to follow-up.²³

On the whole, therefore, the virological and immunological response to treatment in resource-limited countries can evidently be as good as in industrialized settings if a public health approach to scale-up is adopted.²⁴

Box 3. Treatment outcomes for children: data from the KIDS-ART-LINC Collaboration

The KIDS-ART-LINC Collaboration, supported by the french Agence Nationale de Recherches sur le SIDA (ANRS), the European and Developing Countries Clinical Trials Partnership (EDCTP), the United States National Institutes of Health (NIH) and USAID, represents a relevant support to WHO and other organizations for accurately informing the recently developed guidelines on ART for infants and children in resource-limited settings.²⁵

Antiretroviral treatment is an essential part of the overall strategy for fighting the paediatric HIV pandemic, and since 1996 has led to a substantial reduction in HIV-related morbidity and mortality among children in industrialized countries.²⁶ However, few data exist in lower-income countries (LINC). To reduce this information gap, an African network of paediatric ART programmes, the KIDS-ART-LINC Collaboration, was established, bringing together 25 programmes in 15 African countries (see www.rcqhc.org/kids-art-linc).

In 2005–2006 a site assessment of 24 of these programmes showed that clinical practices were well standardized but that the recording of clinical data was weak. Eighteen (75%) of the sites were public health facilities funded by their respective ministries of health, while others were either nongovernmental and faith-

19 WHO and UNAIDS. *Progress on global access to HIV antiretroviral therapy. A report on “3 by 5” and beyond*. Geneva: WHO and UNAIDS; 2006.

20 Munderi P, Watera C, Nakiyingi J, Kasirye A, Walker S, French N, Gilks C, Grosskurth H. *Survival and causes of death two years after introduction of ART in Africa: a historic cohort comparison in Entebbe, Uganda*. Sixteenth International AIDS Conference, 2006. Abstract THLB0208.

21 Woldu A, Lemma W, Tadesse W. *Survival rate under ART: PEPFAR and UNGASS indicator, GE 16*. In: United States President’s Emergency Plan for AIDS Relief, Annual Meeting, Durban, 2006. Abstract 535.

22 Khera A, Dharamshaktu NS, Rewari BB, Tassie J, Chan P, Mahanty B, Garg R. Effectiveness of India’s public sector antiretroviral treatment programme. In: Sixteenth International AIDS Conference, 2006. Abstract WEPE0096.

23 Western Cape Department of Health. *The Western Cape antiretroviral programme: monitoring report, June 2006*. Cape Town: Provincial Government of the Western Cape; 2006.

24 Sow PS, Otiendo LF, Bissagnene E, et al. Implementation of an antiretroviral access programme for HIV-1 infected individuals in resource-limited settings. Clinical results from four African countries. *J Acquir Immune Defic Syndr* 2007; 44(3):262-267.

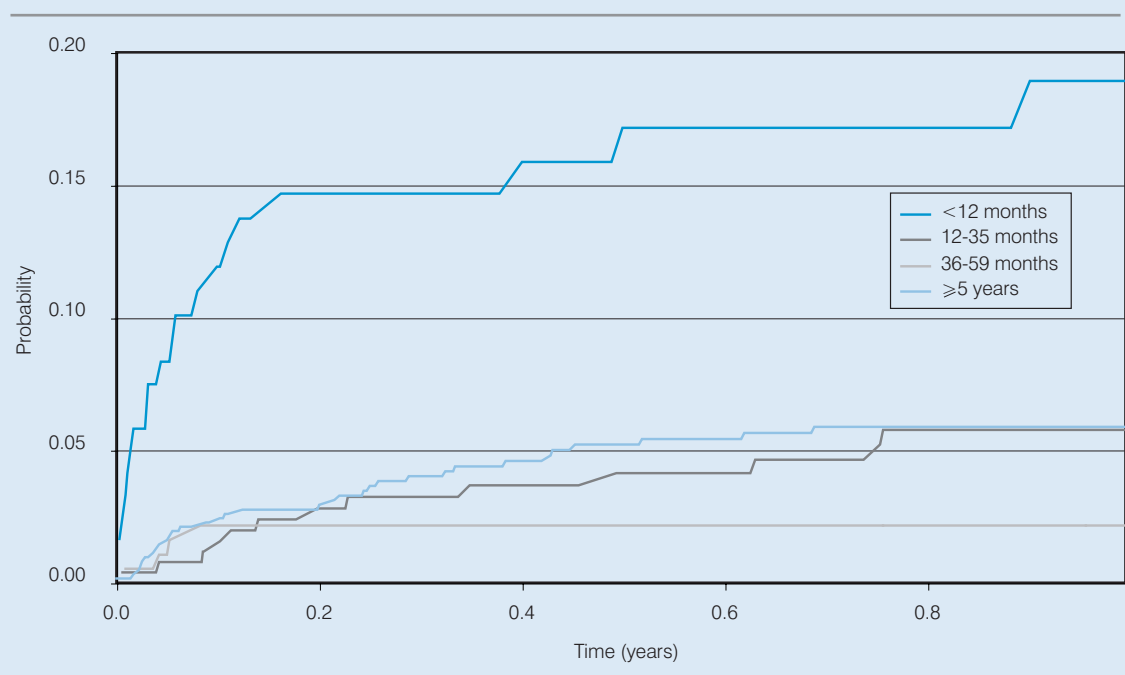
25 WHO. *Antiretroviral therapy of HIV infection in infants and children in resource-limited settings: towards universal access*. Geneva: WHO; 2006.

26 Resino S, Resino R, Maria Bellon J, et al. Clinical outcomes improve with highly active antiretroviral therapy in vertically HIV type-1-infected children. *Clin Infect Dis* 2006;43:243-52.

based organizations or research-based facilities. Seven programmes treated only children, whereas the others were integrated into larger treatment facilities. The median year when paediatric ART started at site level was 2003 (interquartile range 2002–2004). Thirteen sites provided an age breakdown for 2052 children on ART, 7.7% of whom were under 2 years of age. Twenty of the 24 programmes offered free ART.

Preliminary individual patient data from the Collaboration are based on 1195 children on ART in one cohort in Burundi, two in Côte d'Ivoire, one in Gambia, one in Ghana, two in South Africa and one in Zimbabwe, with follow-up of more than one day and available CD4 and haemoglobin at baseline (corresponding to -120/+30 days around the date of ART initiation).²⁷ Of these children, 52% were male, 10% were aged 12 months or less, 66% had severe immunodeficiency and 6.5% had severe anaemia at baseline. Seventy deaths occurred in the first year on treatment and the overall estimated probability of death was 5.5% (95% confidence interval 4.3%–7.1%) at six months and 6.5% at one year (5.1%–8.2%). The 12-month risk of death while on ART was higher in children aged under 12 months (Fig. 7), in those with severe anaemia (NIH, DAIDS 2004 definition) and in those with severe immunodeficiency (WHO criteria issued in 2006) at ART initiation. No difference was observed in this respect between first-line regimens based on NNRTIs and those based on PIs.

Fig. 7. Probability of death in African children starting antiretroviral therapy (ART) according to age at ART initiation (n = 1195), February 2007



Another example of the challenges encountered in pediatric treatment comes from a cohort of 207 HIV-positive children in Kalembe Lembe Paediatric Hospital in the Democratic Republic of Congo, where the survival probability after 300-days was 83%. Most deaths (91%) occurred within three months of enrollment and treatment initiation. The authors concluded that the factors associated with mortality were health care seeking patterns including late presentation for care, malnutrition and weak health care systems.²⁸

²⁷ The KIDS-ART-LINC Collaboration. *Response to antiretroviral therapy (ART) in children in sub-Saharan Africa: a pooled analysis of clinical databases: the KIDS-ART-LINC Collaboration*. Fourteenth Conference on Retroviruses and Opportunistic Infections, Los Angeles, 25–28 February 2007 (Abstract R-193).

²⁸ Callens S., Kokolomami J., Kitetele F., Lusiana J., Colebunders R., Van Rie A., Behets F. Improving survival of children living with HIV in resource poor settings requires a comprehensive programmatic response. XVI international AIDS conference, 2006. Abstract CBD1109.

A recent review revealed that IDUs living with HIV in high-income countries can adhere to ART and benefit significantly from the treatment. However, various studies indicate that ART outcomes for IDUs are poorer than those for patients who do not use drugs, with more rapid progression to an AIDS-defining illness and higher mortality rates. A number of factors are likely to contribute to these poorer outcomes, including delayed initiation of treatment, treatment interruptions and poor treatment adherence. The use of substitution treatment in opioid-dependent people can improve treatment outcomes by facilitating earlier initiation of ART and improving adherence rates.²⁹

Box 4. Encouraging treatment results in low- and middle-income countries

Thailand has the fourth largest number of people on antiretroviral treatment: almost 90 000 are receiving treatment through the public sector. A preliminary analysis of data on HIV/AIDS patients from 746 of 757 (98%) hospitals between January 2000 and March 2005 showed more than 90% survival after 48 months of follow-up. However, those who initiated treatment later and those with lower CD4 counts had a higher risk of mortality. It was concluded that earlier treatment initiation was associated with reduced mortality, and it was recommended that the programme should promote early identification of HIV infection and earlier access to treatment.³⁰

Similar results were reported in other countries, including Botswana, Cameroon, Ethiopia, Peru, Trinidad and Tobago, and Uganda.^{31,32,33,34,35} Botswana was one of the first countries to scale up antiretroviral treatment, beginning in 2002. By December 2006, coverage was estimated to be over 95%, with 84 000 (78 000–90 000) people receiving treatment. Preliminary results from an evaluation of the impact of the treatment programme undertaken in 2006 indicated that, between 2003 and 2004, an 8% reduction was achieved in the national rate of adult mortality. Reduced mortality was associated with early initiation of district treatment programmes and with the overall rate of treatment uptake in the districts. The study demonstrates that, in a high-burden country where mortality attributable to AIDS has been estimated to be 83% of all deaths, antiretroviral treatment has the potential to cause a population-level change in mortality rates.³⁶ Fig. 8 shows the trends in overall mortality and coverage of antiretroviral treatment.

The 2006 UNAIDS/WHO AIDS Epidemic Update reported that the expanded provision of antiretroviral treatment in low- and middle-income countries resulted in an estimated gain of two million life-years since 2002. In sub-Saharan Africa alone, some 790 000 life-years have been gained, the vast majority of them in the past two years of scale-up. In Latin America, where wide-scale treatment provision began earlier, some 834 000 life-years have been gained since 2002.

29 Lert F, Kazatchkine M. Antiretroviral treatment and care for injecting drug users: an evidence-based overview. *International Journal of Drug Policy* (in press).

30 Ningsanond P, Nuchchom K, Kestham K, Fakhongkham K. *Survival time to receive ARVs among HIV-infected patients who are not eligible for ARVs by median CD4 at the initial test*. Sixteenth International AIDS Conference, 2006. Abstract CDB1285.

31 Wolday D, et al. *Survival of human immunodeficiency virus (HIV) infected patients after initiating antiretroviral treatment (ART) in Ethiopia*. Sixteenth International AIDS Conference, 2006. Abstract CDB0596.

32 Tsague L, et al. *Predicting short-term survival and lost to follow-up among HIV-infected patients after antiretroviral therapy initiation in resource-limited settings: preliminary results from an open labelled cohort study in Cameroon, Africa*. Sixteenth International AIDS Conference, 2006. Abstract CDB0623.

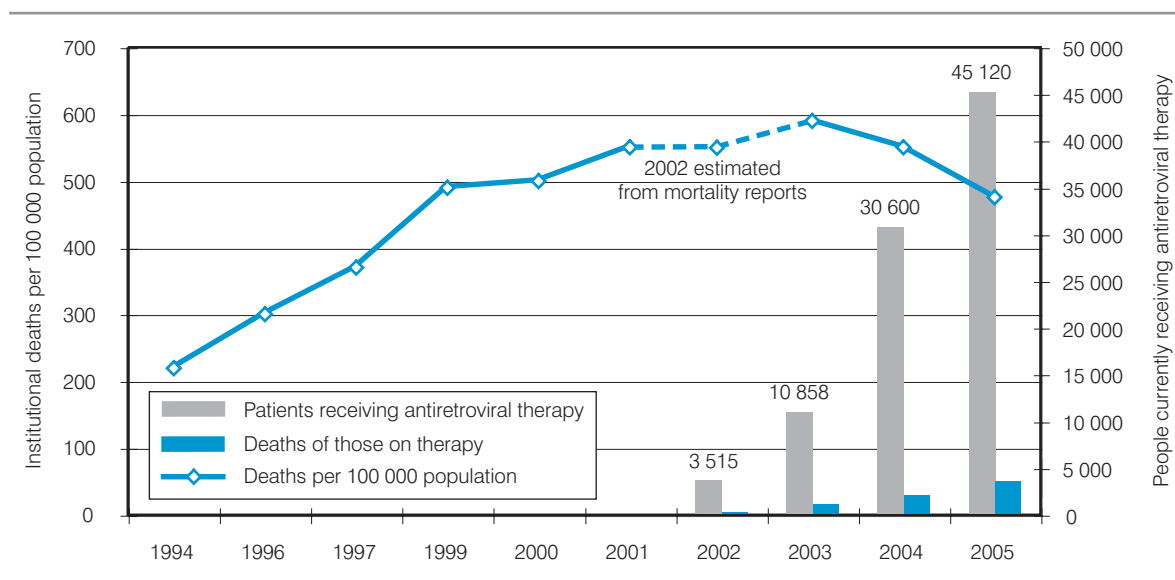
33 Soyer-Labastide S, Nero-Jarvis O, Bartholomew C. *Survival rates in HIV/AIDS up to 45 months in patients who have been on HAART at the Medical Research Centre, Trinidad and Tobago*. Sixteenth International AIDS Conference, 2006. Abstract CDC0012.

34 Collins JA, Claros J, Rojas C, Reyes S. *Survival of HIV-infected patients in poor areas of Lima, Peru in the pre-HAART era*. Third IAS Conference on HIV Pathogenesis and Treatment, 2005. Abstract MoPe11.6C15.

35 Otim TW, Mugenyi PM, Ssali FS, Kityo CM. *Survival analysis of AIDS inpatients at the Joint Clinical Research Centre in Kampala*. Fifteenth International AIDS Conference, 2004. Abstract MoPeC3515.

36 Stoneburner R, Montagu D, Pervilhac C, Fidzani B, Gill W, Kennedy G, Spindler H, Rutherford G. *Declines in adult HIV mortality in Botswana, 2003–2005: evidence for an impact of antiretroviral therapy programmes*. Sixteenth International AIDS Conference, 2006. Abstract THLB0507.

Fig. 8. Patients currently receiving antiretroviral therapy and deaths on therapy, Botswana 1994-2005^a



^a 2005 deaths annualized on basis of deaths until June 2005, reported by November 2005; ART programme data reported until September 2005.

A recent study in Kenya showed that, in addition to improved survival, antiretroviral treatment led to significant improvements in the quality of life. There was a rapid increase in rates of employment for patients and there was a reduced need for boys to work when living with adults on treatment.³⁷ A study of a large employer-sponsored antiretroviral therapy programme in South Africa found reduced absenteeism among employees receiving treatment.³⁸ Significant improvements in the quality of life were reported among patients in northern Thailand one year after initiating antiretroviral therapy, including improved physical and mental health, decreased hospitalization and increases in income, employment and productivity.³⁹

Despite these encouraging results, many countries have reported high death rates before the development of AIDS and a high risk of death in people with very low CD4 cell counts.⁴⁰ The ART-LINC study confirmed these results.⁴¹ This is largely attributable to late diagnosis of HIV infection and late initiation of treatment (Box 4).

37 Thirumurthy H, Graff Zivin J, Goldstein MP. *The impact of antiretroviral therapy on employment outcomes of HIV-infected individuals and their families: evidence from rural western Kenya*. Sixteenth International AIDS Conference, 2006. Abstract TUAD0203.

38 Muirhead D, Kumaranayake L, Hongoro C, Charalambous S, Grant A, Fielding K, Churchyard G. *Health care costs, savings and productivity benefits resulting from a large employer-sponsored ART programme in South Africa*. Sixteenth International AIDS Conference, 2006. Abstract MOPE0674.

39 Chariyalertsak S, Oberdopher P, Thapinta D, Suwanteerangkul J, Sarna A, Guest P, Wu A. *Improved socioeconomic status and quality of life and decreased hospitalization rates among patients in Thailand one year after initializing HAART*. Sixteenth International AIDS Conference, 2006. Abstract HPDD06.

40 Badri M, Lawn SD, Wood R. *Short-term risk of AIDS or death in people infected with HIV-1 before antiretroviral therapy in South Africa: a longitudinal study*. *Lancet* 2006;368 (9543):1254-9.

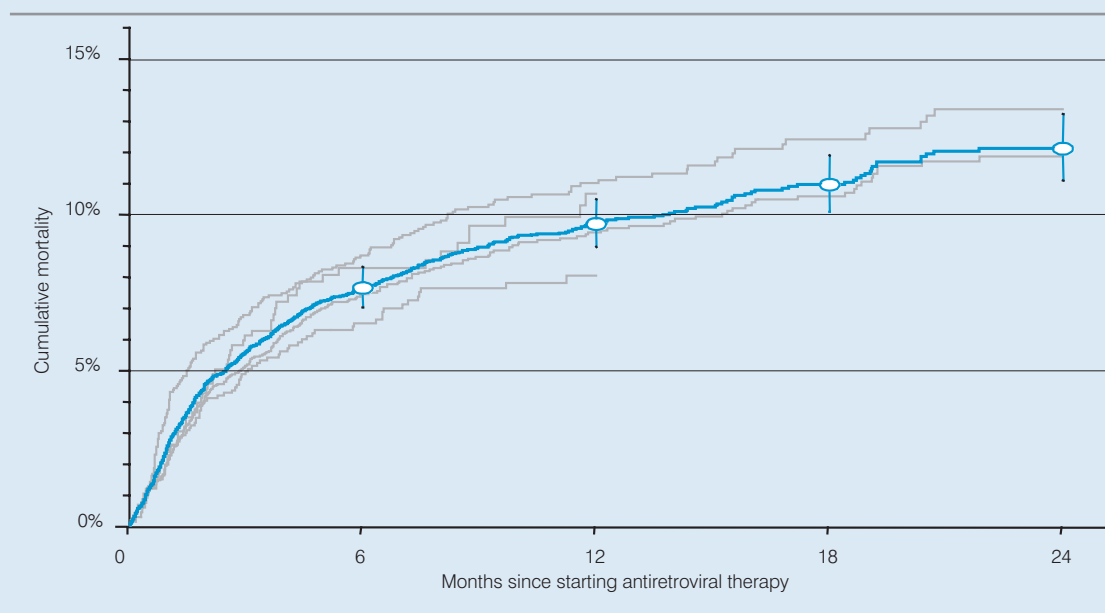
41 The Antiretroviral Therapy in Lower-Income Countries (ART-LINC) Collaboration and ART Cohort Collaboration (ART-CC) Groups. *Mortality of HIV-1-infected patients in the first year of antiretroviral therapy: comparison between low-income and high-income countries*. *Lancet* 2006; 367: 817-24.

Box 5. Research networks examine treatment outcomes in resource-limited settings

The ART-LINC Collaboration, supported by ANRS, EDCTP, NIH and USAID (www.art-linc.org), is a network of clinics in Africa, South America and Asia which was established to examine outcomes for HIV-1-infected patients treated in resource-limited settings and to compare experiences between different settings, delivery modes and types of monitoring. The Therapeutics Research, Education, and AIDS Training in Asia (TREAT Asia) HIV Observational Database (TAHOD) is assessing the outcomes of patients in the Asia-Pacific region. More recently, the International epidemiological Databases to Evaluate AIDS (IeDEA) initiative has established seven regional networks, four of them in sub-Saharan Africa (www.iedea-hiv.org). The clinics and programmes participating in these networks are heterogeneous and include public programmes funded by ministries of health, private for-profit organizations and private not-for-profit clinics run by nongovernmental organizations, and the costs to patients vary widely.⁴²

Data from TREAT Asia and ART-LINC showed that the virological and immunological responses to ART tended to be similar in low- and high-income settings.^{43,44} Loss to follow-up and loss to treatment are, however, important issues in low-income countries. Unpublished data from ART-LINC indicated that, overall, 20% of patients were lost within the first six months, although this varied between programmes, retention being better in public clinics where patients generally had free access to treatment (6% lost to follow-up in the first six months). In many settings, loss to follow-up increased over time as treatment was scaled up.

Fig. 9. Probability of death among people on antiretroviral therapy in four ART programmes in Côte d'Ivoire, Malawi and South Africa, February 2007



Kaplan-Meier curves of probability of death in 7109 HIV-1-infected patients treated in four large ART programmes in Côte d'Ivoire, Malawi and South Africa. Results from individual clinics are shown in grey, combined estimates in blue. ART-LINC (ANRS/NIH) Collaboration, February 2007.

42 Dabis F, Balestre E, Braitstein P, Miotti P, Brinkhof WGM, Schneider M, et al. Antiretroviral therapy in lower-income countries (ART-LINC): International collaboration of treatment cohorts. *Int J Epidemiol* 2005;34:979-86.

43 Zhou J, Kumarasamy N, Ditangco R, Kamarulzaman A, Lee CK, Li PC, et al. The TREAT Asia HIV Observational Database: baseline and retrospective data. *J Acquir Immune Defic Syndr* 2005;38:174-9.

44 Braitstein P, Brinkhof MW, Dabis F, Schechter M, Boule A, Miotti P, et al. Mortality of HIV-1-infected patients in the first year of antiretroviral therapy: comparison between low-income and high-income countries. *Lancet* 2006;367:817-24.

A recent analysis of ART-LINC data showed that mortality rates fell dramatically within the first few months of ART and approached those observed in industrialized countries after four to six months.⁴⁵ The increased mortality in the first months is probably explained by severe comorbidity, including from tuberculosis, and more advanced immunodeficiency at the time of starting treatment in resource-limited settings. Fig. 9 shows the cumulative mortality observed over two years among patients starting treatment in four ART programmes in sub-Saharan Africa: the Lighthouse Programme at Kamuzu Central Hospital in Lilongwe (Malawi), a programme in each of the townships of Khayelitsha and Gugulethu in Cape Town (South Africa), and one at the Centre de Prise en Charge de Recherches et de Formation (CEPREF) in Abidjan (Côte d'Ivoire). These programmes had low rates of loss to follow-up and almost complete ascertainment of deaths. The analysis was based on 7109 patients (64% women, median age 35 years), 624 deaths and 6503 person-years of follow-up. The median CD4 cell count at the start of therapy was 96 cells/ μ l. As shown in Fig. 9, the estimated cumulative mortality was 7.7% at six months, 9.7% at one year and 12.1% at two years.

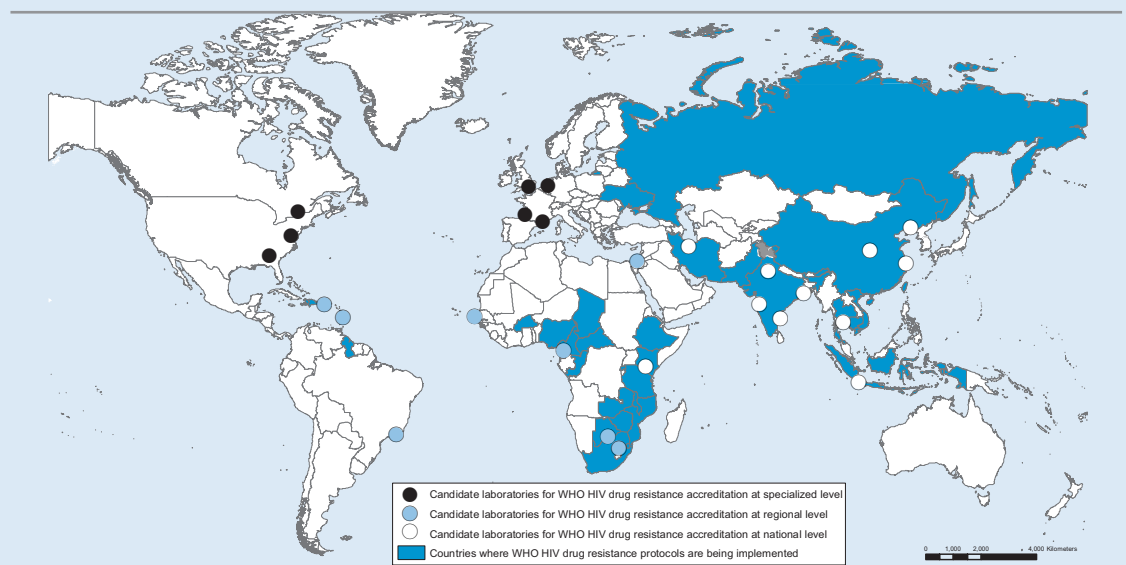
The research networks described here are important for monitoring outcomes in HIV-1-infected patients treated in low-income settings and for making meaningful comparisons between treatment programmes that differ in terms of operational procedures and serve different communities in different countries.

Box 6. HIV drug resistance surveillance on track

A global HIV drug resistance strategy developed by WHO and partners recommends a specific set of actions for monitoring HIV drug resistance in all countries that are scaling up antiretroviral treatment. The goal of the strategy is to prevent, as far as possible, the emergence and transmission of HIV drug resistance. Fig. 10 shows the countries that have begun to implement the WHO strategy and the laboratories that have asked for WHO accreditation to carry out HIV drug resistance genotyping.

Surveys completed using the WHO methodology in six major cities in Asia, Eastern Europe and Africa in 2006 show that the prevalence of transmitted drug-resistant HIV remains below the 5% threshold. More information is available at www.who.int/hiv/drugresistance/

Fig. 10. Low- and middle-income countries implementing WHO drug resistance surveys and the proposed WHO HIVDR Laboratory Network in 2006



45 Op. cit.

2.1.5 Impact of treatment on HIV prevention

The impact of treatment on prevention is a complex issue, involving biological factors (e.g. decreased viral load), demographic factors (e.g. longer sexual life) and behavioral factors (e.g. the impact of treatment on preventive behaviours).

In Uganda, increased access to antiretroviral treatment may have led to decreased HIV transmission rates because of reductions in the viral load.⁴⁶ However, no studies have been done at the population level. Modelling undertaken in resource-poor settings suggests that the impact of increased access to treatment at the population level is unlikely to be sufficient to reduce overall HIV incidence.⁴⁷ Nevertheless, it has also been suggested that treatment could have a major role in strengthening HIV prevention if scaled up adequately.⁴⁸

Concerns have been raised that prevention efforts could be weakened because of a perception that, with the availability of treatment, HIV/AIDS is no longer considered a fatal disease (the so-called disinhibition factor). Some studies in high-income countries have documented disinhibition as a result of treatment availability,⁴⁹ notably among men who have sex with men (MSM), and these findings are supported by evidence of an increase of sexually transmitted infections (including HIV) among MSM^{50,51,52} and heterosexual populations.⁵³ This issue has not been closely studied in low- and middle-income countries. A systematic literature review presented at the 2006 International AIDS Conference found only three studies that met the inclusion criteria, even though the rigor of these studies was qualified as weak by the authors of the review.⁵⁴ All were conducted in Africa (one in Côte d'Ivoire and two in Uganda) between 1999 and 2004.^{55,56,57} In all three studies a majority of HIV-infected participants were sexually abstinent and access to treatment was not associated with an increase in risky sexual behaviours. Six months after the initiation of treatment there had been a 70% decline in risky sexual behaviour. The available evidence shows no indication of behavioral disinhibition attributable to antiretroviral treatment, but this requires confirmation by studies with a stronger methodological approach. As treatment continues to be scaled up in low- and middle-income settings, long-term documentation of risk behaviour and continued prevention support among people receiving antiretroviral treatment are needed.

A population survey conducted in Botswana in 2004 found that significantly lower rates of respondents reported HIV stigmatizing attitudes than had been the case in an earlier survey. A multivariate analysis showed that perceived access to treatment was independently associated with decreased odds of holding at least one stigmatizing attitude and of projected stigma. Inconsistent condom use was associated with increased odds of stigmatizing attitudes. These findings support the hypothesis that access to antiretroviral treatment can help to reduce HIV stigma.⁵⁸

46 Spacek LA, Shihab HM, Kanya MR, Mwesigire D, Ronald A, Mayanja H, Moore RD, Bates M, Quinn TC. Response to antiretroviral therapy in HIV-infected patients attending a public urban clinic in Kampala, Uganda. *Clin Infect Dis* 2006;42(2):252-9.

47 Baggaley RF, Garnett GP, Ferguson NM. Modeling the impact of antiretroviral use in resource-poor settings. *PLoS Medicine* 2006; 3(4): e124.

48 Montaner J, Hogg R, Wood E, Kerr T, Tyndall M, Levy A, Harrigan P. The case for expanding access to highly active antiretroviral therapy to curb the growth of the HIV epidemic. *Lancet* 2006; 368(9534):531-6.

49 Crepaz N, Hart TA, Marks G. Highly active antiretroviral therapy and sexual risk behaviour: a meta-analytic review. *Journal of the American Medical Association* 2004;292(2):224-36. Also: Crepaz N, Marks G. Towards an understanding of sexual risk behaviour in people living with HIV: a review of social, psychological and medical findings. *AIDS* 2002;16:135-49.

50 Katz MH, Schwarcz SK, Kellogg TA, et al. Impact of highly active antiretroviral therapy on HIV sero-incidence among men who have sex with men: San Francisco. *American Journal of Public Health* 2002;92:388-94.

51 Increases in unsafe sex and rectal gonorrhoea among men who have sex with men: San Francisco 1994–1997. *Morb Mortal Wkly Rep* 1999;48:45-8.

52 Stolte IG, Dukers NH, de Wit JB, et al. Increase in sexually transmitted infections among homosexual men in Amsterdam in relation to HAART. *Sexually Transmitted Infections* 2001;77:184-6.

53 Scheer S, Lee Chu P, Klausner JD, et al. 2001. Effect of highly active antiretroviral therapy on diagnoses of sexually transmitted diseases in people with AIDS. *Lancet* 2001;357:432-5.

54 Kennedy C, O'Reilly K, Medley A, Sweat M. *The impact of HIV treatment on sexual risk behavior in developing countries: a systematic review*. Sixteenth International AIDS Conference, 2006. Abstract TUPE0811.

55 Bunnell R, Ekwaru JP, Solberg P, Wamai N, Bikaako-Kajura W, Were W, Coutinho A, Liechty C, Madraa E, Rutherford G, Mermin J. Changes in sexual behavior and risk of HIV transmission after antiretroviral therapy and prevention interventions in rural Uganda. *AIDS* 2006;20(1):85-92.

56 Moatti JP, Prudhomme J, Traore DC, Juillet-Amari A, Akribi HA, Msellati P. Côte d'Ivoire HIV Drug Access Initiative Socio-Behavioural Evaluation Group. Access to antiretroviral treatment and sexual behaviours of HIV-infected patients aware of their serostatus in Côte d'Ivoire. *AIDS* 2003;17(Suppl 3):S69-77.

57 Bateganya M, Colfax G, Shafer LA, Kityo C, Mugenyi P, Serwadda D, Mayanja H, Bangsberg D. Antiretroviral therapy and sexual behavior: a comparative study between antiretroviral-naïve and -experienced patients at an urban HIV/AIDS care and research center in Kampala, Uganda. *AIDS Patient Care STDS* 2005;19(11):760-8.

58 Gopalakrishnan C. HIV/AIDS awareness in Botswana and its implications on prevention – an analysis of the Botswana AIDS Impact Survey (BAIS) II 2004 results. Sixteenth International AIDS Conference, 2006. Abstract CDD1448.

2.2 Preventing HIV transmission from mother to child

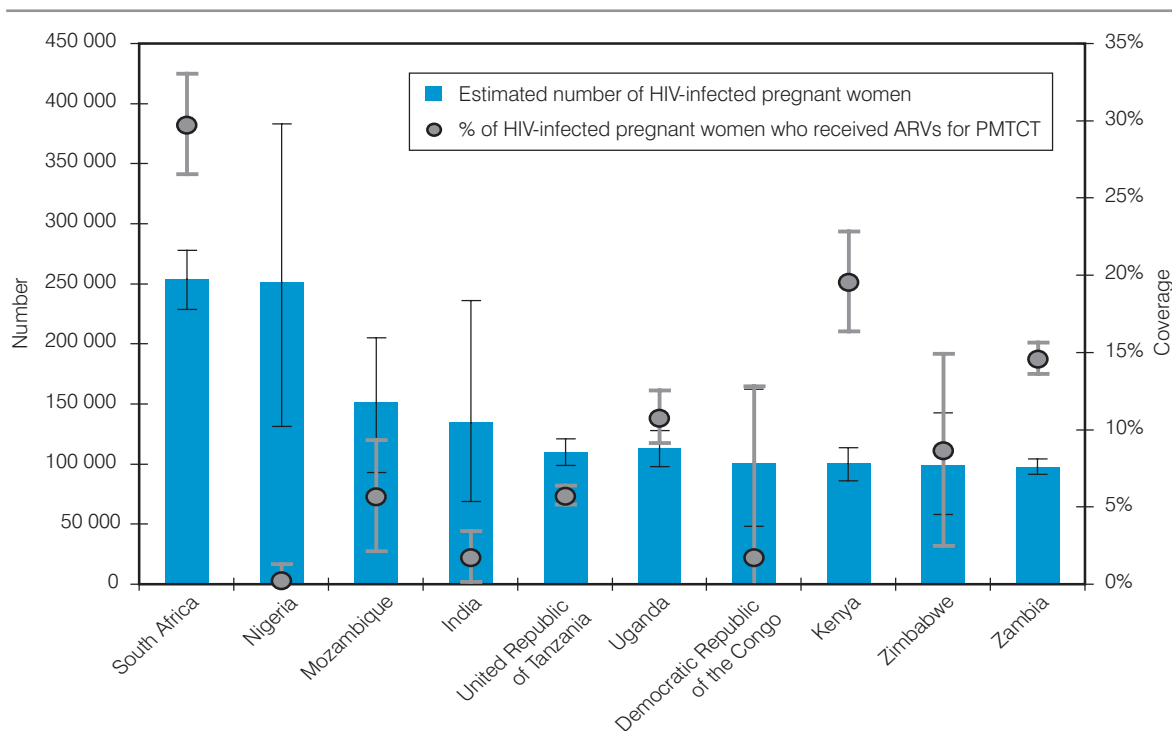
2.2.1 Coverage and availability of services

Women with HIV are at risk of transmitting the virus to their infants during pregnancy, birth and breast-feeding. Without any interventions, between 20% and 45% of infants may become infected.⁵⁹

Of the estimated 2.3 million (1.7–3.5 million) children under the age of 15 years living with HIV, well over 90% are thought to have become infected through mother-to-child transmission. Despite numerous statements of political commitment,⁶⁰ a well-defined set of interventions and the existence of know-how for their implementation, the vast majority of pregnant women in need of PMTCT services are not receiving them. In 2005, about 220 000 of the more than 2 million pregnant women estimated to be living with HIV received antiretroviral prophylaxis for PMTCT, with an estimated coverage of 11% (8%–16%).

Over 85% of HIV-infected pregnant women live in sub-Saharan Africa. The 10 countries with the highest numbers of HIV-infected pregnant women account for two-thirds of women requiring PMTCT interventions in low- and middle-income countries and, with the exception of India, are all located in sub-Saharan Africa. Coverage of antiretroviral prophylaxis is still relatively low in these countries: only in South Africa are more than 25% of the estimated HIV-infected pregnant women receiving antiretroviral prophylaxis (Fig. 11).

Fig. 11. Ten low- and middle-income countries with the highest estimated numbers of HIV-infected pregnant women and corresponding percentages of HIV-infected pregnant women who received ARVs for PMTCT, 2005



† The bar indicates the uncertainty range around the estimate.

59 De Cock KM, et al. Prevention of mother-to-child transmission in resource-poor countries: translating research into policy and practice. *Journal of the American Medical Association* 2000;283 (9):1175-82.

60 For example, in the Declaration of Commitment of the United Nations General Assembly Special Session (UNGASS) on HIV/AIDS in 2001, a commitment was made to achieve reductions of 20% and 50% in the proportion of infants infected with HIV by 2005 and 2010 respectively in countries with generalized epidemics, while providing 80% coverage of appropriate interventions. Millennium Development Goal 4 aims to reduce by two-thirds the mortality rate among children aged under 5 years by 2015. The Global High-Level Partners Forum on PMTCT held in December 2005 in Abuja resulted in a call to action whereby governments were requested to commit themselves to working together to achieve an HIV-free and AIDS-free generation by 2015.

Data from countries in sub-Saharan Africa⁶¹ indicate that the proportion of HIV-infected pregnant women receiving antiretroviral prophylaxis in 2005 varied from under 1% to 54% and that the overall regional coverage was 11% (8%-15%). It is estimated that overall coverage amounts to 75% (38%-95%) in Eastern Europe and Central Asia, 24% (13%-46%) in Latin America and the Caribbean, 5% (3%-10%) in East, South and South-East Asia, and <1% in North Africa and the Middle East.

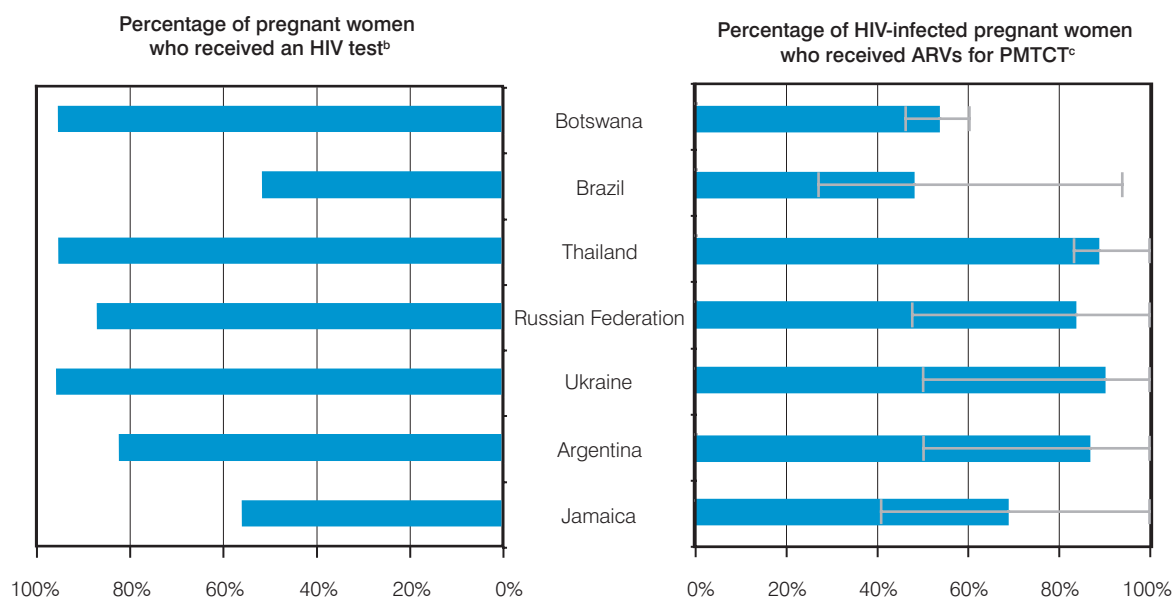
Box 7. Comprehensive PMTCT

A comprehensive set of PMTCT interventions consists of the following key components:

1. The primary prevention of HIV infection among women.
2. The prevention of unintended pregnancies among HIV-infected women.
3. The prevention of HIV transmission from HIV-infected women to their infants.
4. The provision of appropriate treatment, care and support to HIV-infected mothers and their infants and families.

Although more than 100 countries have established PMTCT programmes, most have not been scaled up to meet the need for services. By 2005 only seven countries had provided antiretroviral prophylaxis to 40% or more of HIV-infected pregnant women (Fig. 12).

Fig. 12. Percentages of pregnant women who received an HIV test and percentages of HIV-infected pregnant women receiving ARVs for PMTCT, selected countries, 2005^a



a Countries with at least 40% of HIV-infected pregnant women who received ARVs for PMTCT are included in this graph (countries with less than 500 estimated HIV-infected pregnant women are not included). Countries are ranked by the numbers of HIV-infected pregnant women, i.e. Botswana has the highest number and Jamaica the lowest.

b Denominator is estimated number of pregnant women (15-49 years old) as of 2005.

c Denominator is estimated number of HIV-infected pregnant women (15-49 years old) as of 2005.

— The bar indicates the uncertainty range around the estimate.

Source: UNICEF and WHO on behalf of the expanded Interagency Task Team on PMTCT, «A report card on the prevention of mother-to-child transmission of HIV and paediatric HIV care», 2006 (forthcoming).

61 UNICEF/UNAIDS/WHO. *Children and AIDS: a stocktaking report*. UNICEF, UNAIDS, WHO; 2007.

Further, many of the HIV-infected pregnant women who receive antiretroviral prophylaxis for mother-to-child transmission in low- and middle-income countries receive single-dose nevirapine, which is less efficacious than a prophylactic combination regimen.⁶² Coverage for PMTCT is seriously inadequate and is unlikely to result in the attainment of the 2001 UNGASS target of a 50% reduction in the proportion of children infected with HIV by 2010. More efficacious regimens can be used, and a concerted effort should be made to reduce and prevent HIV transmission through safe infant feeding.

The UN Interagency Task Team on PMTCT and Paediatric HIV Care is developing a global strategy to guide countries on scaling up their PMTCT programmes. This strategy will provide an integrated framework to assist policy-makers, programme managers and implementing partners to accelerate the scale-up of high-impact PMTCT interventions towards universal coverage. It outlines key approaches to accelerating scale-up, along with specific actions that countries should take in order to reach the goal of eliminating new HIV infections in infants by 2010.

Box 8. PMTCT in Rwanda

PMTCT was introduced in Rwanda at the end of 1999. The first pilot site was at the Kicukiro Health Centre, and two more were launched soon after at the Muhura and Gisenyi Health Centres. Since then, PMTCT has been rapidly scaled up through the involvement of various partner organizations. Fifty-three health facilities were providing PMTCT services in 2002, and 221 were doing so by mid-2006, representing 52% of all facilities⁶³ (Fig. 13).

According to the Treatment and Research AIDS Centre, 90% of the pregnant women attending ANC settings (178 054 / 198 234) that provide PMTCT interventions were tested for HIV, representing approximately 47% of the country's pregnant population. Among the women tested, 4.8% were HIV-positive (8631 / 178 054). Data from 2005 showed that in Rwanda, as in many other settings, although HIV-positive pregnant women were identified, there was an attrition of follow-up PMTCT services (Fig. 14).⁶⁴ Only two-thirds of women identified as HIV-positive received antiretrovirals for PMTCT. Furthermore, only a very small proportion of HIV-exposed infants were tested to ascertain their HIV status, making infant follow-up, care and treatment inadequate. A lack of capacity and commodities were major constraints and hindered access to early diagnosis and treatment, nutritional support and co-trimoxazole prophylaxis.

However, remarkable progress can be made if there is political commitment and if adequate human and financial resources are available. In 2005, less than 10% of HIV-exposed infants were tested at 18 months. With the support of partners, especially the United States President's Emergency Plan for AIDS Relief, Rwanda has achieved a significant improvement in the early diagnosis of HIV in children. In the first six months of 2006, HIV-positive mothers reportedly delivered 5904 exposed infants, of which 2694 (45.6%) were followed up until testing.⁶⁵ This suggests a significant improvement but also shows that more than 50% of mother-baby pairs were lost to follow-up and failed to benefit from early treatment and care.

In September 2005, Rwanda approved a new PMTCT protocol, shifting the standard from single-dose nevirapine to a more efficacious regimen combining AZT and single-dose nevirapine, and implementation began in January 2006. The new protocol is being adopted in phases: as yet only one-third of PMTCT sites are using it.

With the scale-up of antiretroviral treatment, eligible HIV-infected pregnant women should receive treatment for their own health, which also serves as prophylaxis for MTCT. Only 70 of the 232 PMTCT sites can provide antiretroviral treatment because of a lack of trained personnel, CD4 testing technology and other aspects of laboratory infrastructure.

62 Le Coeur S, Kanshana S, Jourdain G. HIV-1 transmission from mother to child and its prevention. *Med Trop (Mars)* 2003;63(4-5):381-90.

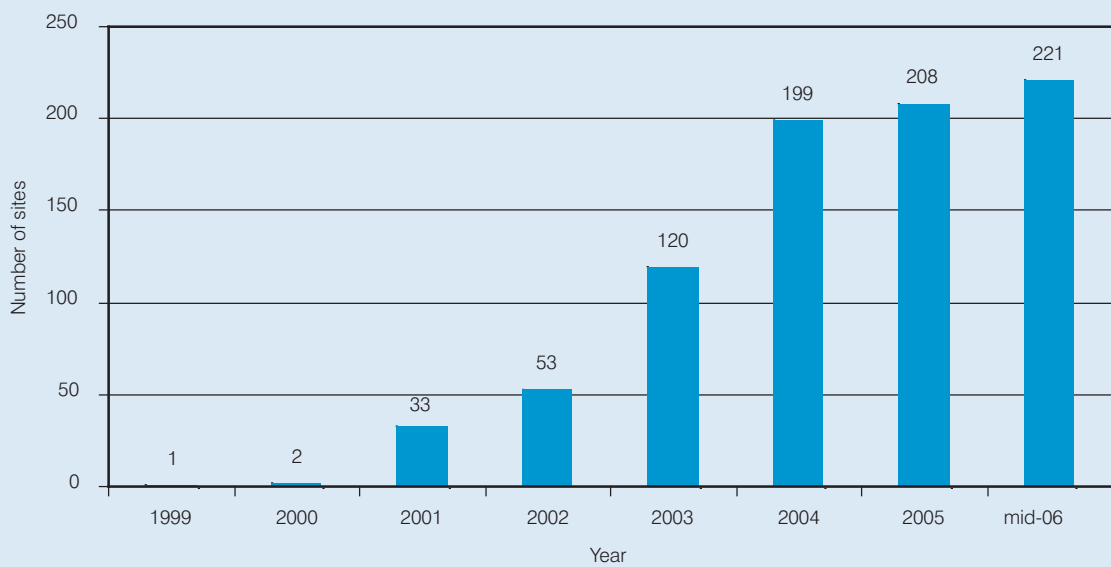
63 Treatment and Research AIDS Centre, Ministry of Health, Rwanda. Presentation at International AIDS Conference, Toronto, 2006.

64 UNICEF/UNAIDS/WHO. *Children and AIDS: a stocktaking report*. UNICEF, UNAIDS, WHO; 2007.

65 Data from the Ministry of Health, Rwanda.

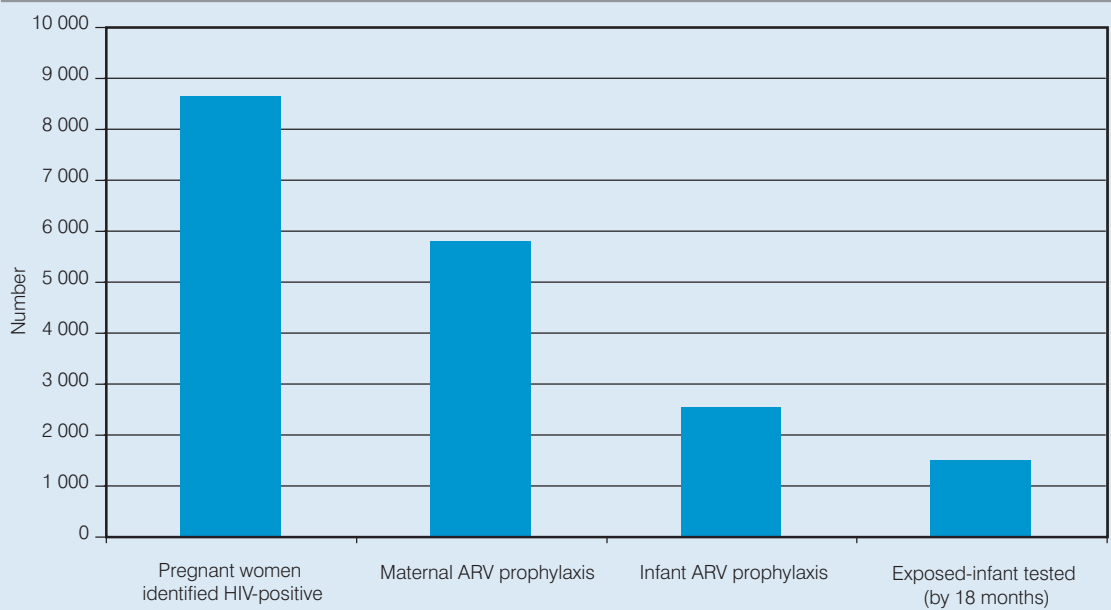
Meanwhile, the Ministry of Health is developing a referral system to link HIV and maternal and child health services at the community and national levels in the context of Rwanda's decentralization policy. Existing PMTCT and paediatric HIV care and treatment scale-up plans aim to address specific constraints, e.g. low uptake of services, linkage mechanisms, nutrition, reproductive health services and general capacity-building. Although there is still room for expansion and improvement, Rwanda has made rapid progress in its PMTCT programme, the continuing success of which will depend to a large extent on maintaining good coordination of interventions and promoting partnership at all levels.

Fig. 13. Number of PMTCT sites in Rwanda, 1999-2006



Source: Ministry of Health, Rwanda

Fig. 14. Number of people receiving selected PMTCT interventions, Rwanda, 2005



Source: Ministry of Health, Rwanda

2.3 HIV testing and counselling

2.3.1 Coverage and availability of services

The available data suggest that the global coverage of HIV testing and counselling remains unsatisfactorily low. Surveys in heavily affected countries have shown that knowledge of HIV status is limited.

Recently completed demographic and health surveys in 12 high-burden countries of sub-Saharan Africa accounting for 47% of adults and children living with HIV/AIDS in the region in 2005, showed that, among the general population, the median percentages of men and women who had been tested for HIV and had received the results were 12% and 10% respectively (Table 3).

Table 3. Percentages of all men, all women, HIV-positive men and HIV-positive women (aged 15–49 years) in selected countries of sub-Saharan Africa who were ever tested for HIV and received the results, 2003-2005

Country	Date of survey	% of all men who knew their status ^a	% of HIV-positive men who knew their status ^b	% of all women who knew their status ^a	% of HIV-positive women who knew their status ^b
Botswana	2005	10.3		17.4	
Cameroon	2004	9.7	25.1	13.9	23.6
Ethiopia	2005	3.8		4.9	
Ghana	2003	7.4	12.4	7.5	8.2
Kenya	2003	13.1	18.2	14.3	22.8
Lesotho	2004	12.0	16.8	9.1	16.2
Malawi	2004	12.9	15.0	15.1	20.0
Mozambique	2003	3.7		3.6	
Nigeria	2003	6.4		13.6	
Republic of the Congo	2005	9.5		10.6	
United Republic of Tanzania	2004	12.1		12.3	
Uganda	2004	12.7	23.5	10.8	15.0

Source: Demographic and Health Surveys, MEASURE DHS, 2003–2005.

a Percent distribution of men or women aged 15–49 years who were ever tested for HIV and received test results.

b Percent distribution of HIV-positive men or women aged 15–49 years who were ever tested for HIV and received results of the last test before the survey.

Knowledge of status varies between countries. In Lesotho, where adult HIV prevalence is 23%, a survey in 2004 found that only 12% of women and 9% of men had ever been tested for HIV and received the results.⁶⁶ In Nigeria a survey in 2003 found that 6% of women and 14% of men had ever been tested for HIV and received the results.⁶⁷ In Ethiopia a survey in 2004 revealed that 4% of women and 5% of men had ever been tested for HIV and received the results.⁶⁸ In South Africa a survey in 2005 found that 31% of women and 26% of men had previously been tested for HIV.⁶⁹ In most countries of sub-Saharan Africa, knowledge of status was higher among people living in urban areas than among those living in rural areas, and correlated positively with the level of education and wealth. For instance, in Ethiopia in 2004, 17% of women in urban areas had received an HIV test and the result, whereas only 1% of women in rural areas had received a test and the result. The highest testing rates were observed among people with a secondary or higher education and among those in the highest wealth quintile. In Malawi in 2004, 25% of women and 26% of men with secondary or higher education were ever tested and received the results; the corresponding values for women and men with no education were 8% and 10% respectively.⁷⁰

66 Ministry of Health and Social Welfare, Lesotho; Bureau of Statistics, Lesotho; and ORC Macro. 2005. *Lesotho Demographic and Health Survey 2004*.

67 National Population Commission, Nigeria, and ORC Macro. 2004. *Nigeria Demographic and Health Survey 2003*.

68 Central Statistical Agency, Ethiopia, and ORC Macro. 2006. *Ethiopia Demographic and Health Survey 2005*.

69 *South African National HIV Prevalence, HIV Incidence, Behaviour and Communication Survey 2005*.

70 National Statistical Office, Malawi, and ORC Macro. 2005. *Malawi Demographic and Health Survey 2004*.

Information on the number of people living with HIV/AIDS who know their HIV-positive status is even more limited. Data from population-based surveys incorporating HIV tests undertaken in a few countries of sub-Saharan Africa showed that the percentages of women and men living with HIV who knew their status before the surveys were in the ranges 12%–25% and 8%–24% respectively (Table 3). In Cameroon a survey in 2004 found that 25% of men and 24% of women living with HIV/AIDS had ever been tested for HIV and received the results before the survey.⁷¹ In Lesotho, fewer than 17% of men and women living with HIV/AIDS had been tested for HIV and received the results before a survey in 2004.⁷² In Ghana a survey in 2003 found that 12% of women and 8% of men living with HIV/AIDS knew their HIV status before the survey.⁷³

Data on testing among most-at-risk populations, while limited, also suggest relatively low levels of knowledge of HIV status. In Indonesia, data collected in 2004 and 2005 indicated that 15% of sex workers and 18% of IDUs who were surveyed had taken an HIV test and had learnt the results in the preceding 12 months.⁷⁴ In Ukraine, data collected in 2004 showed that 27% of IDUs had received HIV testing and counselling during the preceding 12 months and knew the results.⁷⁵

2.3.2 Testing and counselling for pregnant women

HIV testing and counselling is essential for identifying women who can benefit from treatment either immediately or later, or from interventions to prevent HIV in their infants. Entry to such programmes is initially determined by the proportion of HIV-infected pregnant women identified, often through an HIV test in antenatal care settings.

In more than 70 surveyed low- and middle-income countries that reported data for 2005, only 10% of pregnant women received an HIV test. In sub-Saharan Africa the percentage was 9%, while there was higher coverage in Latin America and the Caribbean (46%) and in Eastern Europe and Central Asia (75%). The high coverage in Eastern Europe was considerably influenced by the large proportion of women attending ANC who received HIV testing in the Russian Federation (about 90%). Testing coverage in pregnant women is low in many of the 10 countries with the highest estimated numbers of HIV-infected pregnant women (Fig. 15).⁷⁶

The seven countries with the highest PMTCT antiretroviral treatment coverage have relatively high percentages of pregnant women receiving an HIV test. Through testing, pregnant women who can benefit from PMTCT interventions are identified and can be referred to access key services (Fig. 12).

71 National Statistics Institute, Cameroon, and ORC Macro. 2004. *Cameroon Demographic and Health Survey 2004*.

72 Lesotho, op. cit.

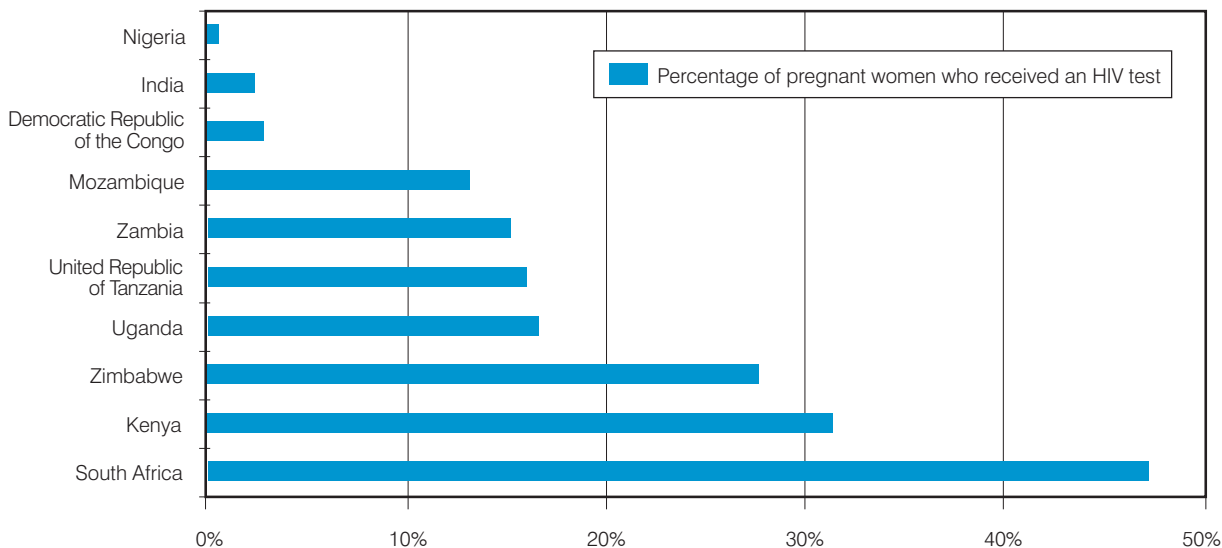
73 Ghana Statistical Service, Noguchi Memorial Institute for Medical Research, and ORC Macro. 2004. *Ghana Demographic and Health Survey 2003*. Calverton, Maryland: GSS, NMIMR, and ORC Macro.

74 *Country report on the follow-up to the Declaration of Commitment on HIV/AIDS (UNGASS), Republic of Indonesia, 2004–2005*, accessed at: http://data.unaids.org/pub/Report/2006/2006_country_progress_report_indonesia_en.pdf on 29 January 2007.

75 *National report on the follow-up to the Declaration of Commitment on HIV/AIDS (UNGASS), Ukraine, 2003–2005*, accessed at: http://data.unaids.org/pub/Report/2006/2006_country_progress_report_ukraine_en.pdf on 29 January 2007.

76 UNICEF and WHO on behalf of the expanded Interagency Task Team on PMTCT. *A report card on the prevention of mother-to-child transmission of HIV and paediatric HIV care, 2006*. (in press).

Fig. 15. Percentage of pregnant women who received an HIV test in the ten countries with the highest estimated number of HIV-infected pregnant women, 2005



Source: UNICEF and WHO on behalf of the expanded Interagency Task Team on PMTCT, 'A report card on the prevention of mother-to-child transmission of HIV and paediatric HIV care', 2006 (forthcoming).

2.3.3 HIV testing and counselling for TB patients⁷⁷

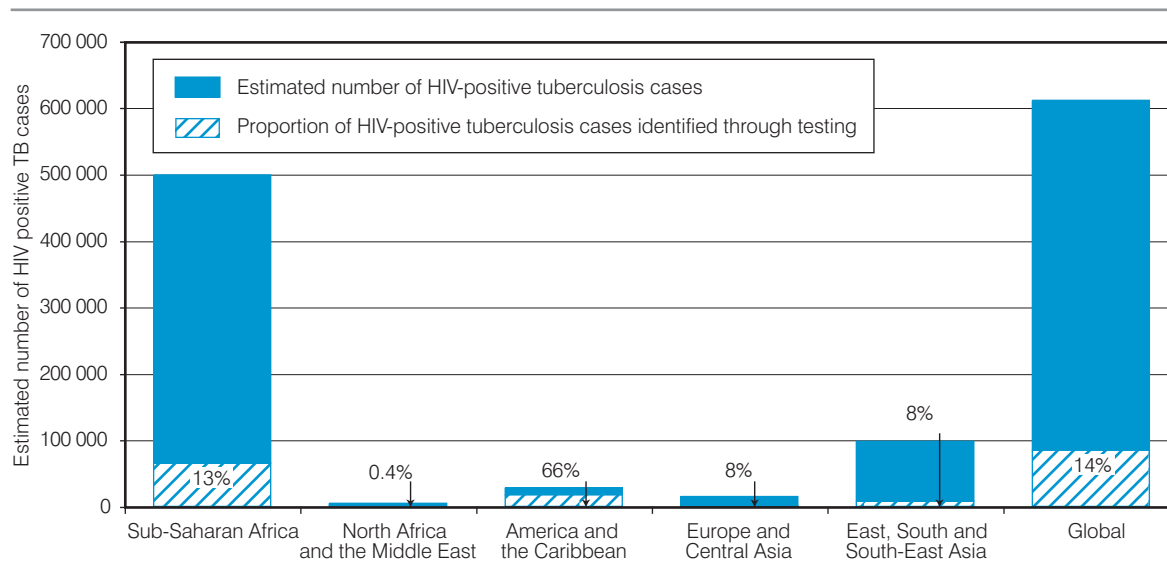
Tuberculosis patients in settings of high HIV prevalence have high rates of HIV coinfection. Ensuring that TB patients receive HIV testing and counselling should therefore be a high a priority for the health sector.

Data suggest that since 2003 there has been a threefold increase in both HIV testing of TB patients and detection of HIV/TB coinfection. Nevertheless, the total coverage of HIV testing and counselling for TB patients is still very low globally and, as TB patients are already in the health care system, represents a major missed opportunity for HIV prevention, treatment and care.

In 2005, 7% of TB patients were tested for HIV worldwide, of whom 23% tested HIV-positive. Furthermore, countries with generalized HIV epidemics reported that only 13% of all TB patients were tested for HIV, of whom 48% were HIV-positive. Thus, by not offering HIV testing to all TB patients in countries with generalized HIV epidemics an opportunity is being missed to inform approximately 460 000 HIV-positive TB patients of their status and ensure access to comprehensive HIV treatment, care and support. Globally, 86% of the estimated number of HIV-positive TB patients are not tested for HIV during their treatment (Fig. 16).

⁷⁷ WHO. *Global tuberculosis control: surveillance, planning, financing*. Geneva: WHO; 2007 (WHO/HTM/TB/2007.376).

Fig. 16. Proportion of the estimated total number of HIV-positive tuberculosis cases identified through testing for HIV in 2005



A rapid expansion of HIV testing among TB patients, linked to provider-initiated testing and counselling, has recently occurred in some African countries. For example, in Rwanda in 2004, 46% of TB patients were tested for HIV and by late 2006 this had increased to 81%. In Kenya in 2005, 32% of TB patients were tested for HIV; this had increased to 64% by 2006. In Malawi in 2005, some 48% of TB patients were tested for HIV, of whom 69% were found to be HIV-positive.

Testing patterns vary between regions. Only 10% of TB patients were tested for HIV in sub-Saharan Africa, which carries 80% of the global HIV burden of TB, whereas 26% of TB patients were tested for HIV in Latin America and the Caribbean and 38% were tested in Europe and Central Asia. Of the patients tested for HIV in TB programmes, approximately 51% were found to have HIV in sub-Saharan Africa, whereas the corresponding values were 17% in Latin America and the Caribbean and 19% in Asia. Provider-initiated HIV testing and counselling is an important strategy for expanding access to HIV/AIDS treatment and care for TB patients.

2.4 Interventions for injecting drug users

It is estimated that up to 10% of all new HIV infections are attributable to injecting drug use (30% if Africa is excluded), and that approximately 3 million past and current IDUs are living with HIV/AIDS.⁷⁸ Injecting drug use is a major mode of HIV transmission in several regions and is emerging as a concern in Africa. Moreover, among most-at-risk populations, the best data available are for IDUs. For these reasons the present report focuses on the coverage of, and access to, harm reduction interventions for this population group. Future reports will address access to HIV/AIDS services for other at-risk populations, such as sex workers, men who have sex with men, and prison populations.

Measuring the extent to which most-at-risk populations are accessing HIV-related services is a challenge because it requires an understanding of how many people are vulnerable to HIV infection. Although debate continues on the quality of services for IDUs and on how coverage is measured,⁷⁹ the methodology for setting coverage targets for this population is gradually being improved.^{80,81,82}

78 UNAIDS. *Report on the global AIDS epidemic*. Geneva: UNAIDS; 2006.

79 Sharma M, et al. Coverage of HIV prevention programmes for injection drug users: confusions, aspirations, definitions and ways forward. *International Journal of Drug Policy* (in press).

80 UNAIDS/WHO. *Estimating the size of populations at risk for HIV: Issues and Methods*. UNAIDS/WHO Working Group on HIV/AIDS/STI surveillance. 2003.

81 UNAIDS. *Guide to monitoring and evaluating national HIV prevention programmes for most-at-risk populations in low-level and concentrated epidemic settings with applications for generalized epidemics*. Geneva: UNAIDS; 2006.

82 WHO/UNAIDS/UNODC. *Technical guide for countries to set targets for universal access to HIV prevention, treatment and care for injecting drug users*. (forthcoming)

Estimates from 94 reporting low- and middle-income countries suggest that the proportion of IDUs receiving some type of prevention service increased from 4.3% in 2003 to 8% in 2005.⁸³ Specifically, these estimates suggest that in such countries the number of IDUs receiving risk reduction information, education and communication increased threefold between 2003 (320 000) and 2005 (1 100 000). The numbers accessing sterile injecting equipment, or equipment decontamination programmes, also increased, from 150 000 in 2003 to 400 000 in 2005, and those accessing opioid substitution therapy increased from 20 000 to 33 000 in the same period.

Despite these trends, coverage is still very low in comparison with the size of the IDU population, estimated globally in 2003 to be approximately 13.2 million.⁸⁴

Box 9. Injecting drug use is increasing in Africa

Data on the prevalence of injecting drug use in Africa is limited, partly because of poor information-gathering systems. Information is based on only a few cross-sectional surveys. However, a recent review of injecting drug use in six African countries⁸⁵ suggests that it is increasing in sub-Saharan Africa. The spread of HIV in Mauritius is driven by injecting drug use, with high rates of unprotected sex and needle-sharing reported among drug users and sex workers. In both Egypt and Nigeria, IDUs exhibit little knowledge of the risk of HIV transmission. In Nigeria the HIV infection rate among drug users is higher than that in the general population.

The demand for treatment of heroin dependence is increasing in South Africa, and needle-sharing appears to be a common practice among IDUs in Cape Town. In the United Republic of Tanzania the use of communal injecting areas occurs, and “flashblood” is a new needle-sharing practice emerging among female sex workers in Dar-es-Salaam. In a recent study in Zanzibar the sharing of needles and blood (flash) was reported by 46% and 9% of IDUs respectively.⁸⁶ Yet prevention campaigns have been slow to address these challenges. In South Africa, for example, HIV/AIDS awareness and prevention campaigns have traditionally not targeted white South Africans, even though injecting drug use is most prevalent in this population group. There is therefore an urgent need for harm reduction measures to be included in national HIV education campaigns in Africa.

All countries in Eastern Europe and Central Asia reported having at least one dedicated needle and syringe exchange programme by the end of 2005.⁸⁷ However, coverage is inadequate in respect of the number sites and the number of injectors reached. A survey conducted in 2001–2002 revealed that 213 sites were providing needle and syringe exchange in 25 countries in the region. The total number of IDUs reached per year by these programmes was around 250 000. Only Bulgaria, the Czech Republic, Estonia, Georgia, Hungary, Latvia, Lithuania, the Former Yugoslav Republic of Macedonia, Slovakia, and Slovenia reached more than 10% of the IDU population with such programmes. Other evidence suggests that coverage over 10% is also provided in Croatia. Coverage elsewhere is often below 5%, particularly in countries that could benefit most from this intervention, e.g. the Russian Federation.⁸⁸

In 2005, substitution therapy was legal in 16 countries of Eastern Europe and Central Asia.⁸⁹ Data on the number of patients on such therapy were found for 14 countries, where coverage ranged from 0.9% to 1.1% of IDUs. In Ukraine, which has an estimated IDU population of 397 000, only 165 patients were receiving substitution therapy in 2005. In the Russian Federation all forms of opioid substitution therapy (OST) remain illegal and no patients receive this treatment. Methadone maintenance therapy programmes have begun recently in many of these countries:

83 Stover J, Fahnstok M. *Coverage of selected services for HIV/AIDS prevention, care and support in low- and middle-income countries in 2005*. Washington DC: Constella Futures Policy Project; 2006. <http://www.futuresgroup.com/Documents/3482HIVCoverage2005.pdf>

84 Aceijas C, et al. Global overview of injecting drug use and HIV infection among injecting drug users. *AIDS* 2004;18:2295-303.

85 Dewing S, et al. Review of injection drug use in six African countries: Egypt, Kenya, Mauritius, Nigeria, South Africa, and Tanzania. *Drugs: education, prevention and policy* 2006;13(2):121-37.

86 Damoha M, et al. *HIV predisposing behaviour among substance users in Zanzibar-Tanzania*. Sixteenth International AIDS Conference, 2006. Abstract CDD0620.

87 Donoghoe MC. *Injecting drug use, harm reduction and HIV/AIDS*. In: Matic S, Lazarus JV, Donoghoe MC. *HIV/AIDS in Europe. Moving from Death Sentence to Chronic Disease Management*. WHO/EURO; 2006.

88 Donoghoe MC. 2006. Op. cit.

89 UNODC. *An overview of global responses to HIV associated with injecting drug use*. UNODC; 2006 (Draft report commissioned on behalf of the Reference Group on HIV/AIDS Prevention and Care among IDUs in Developing and Transitional Countries).

Kyrgyzstan was the first country in Central Asia to begin methadone maintenance programmes in 2002. Ukraine initiated OST with buprenorphine in 2004; Moldova and Georgia did so with methadone in 2004 and 2005 respectively. Substitution therapy is more widely available in Central and South-East Europe, including Croatia, the Czech Republic and the Former Yugoslav Republic of Macedonia, but even here coverage rates are below 15%. Slovenia, where an estimated 49% of IDUs (or 39% of problem drug-users) receive OST, is a notable exception in this region.⁹⁰

Ten countries or territories in South and South-East Asia and three in East Asia and the Pacific each had at least one dedicated needle and syringe exchange programme in 2005: Bangladesh, Cambodia, China, India, Indonesia, the Islamic Republic of Iran, Malaysia, Myanmar, Nepal, Pakistan, and Viet Nam.⁹¹ Opioid substitution therapy was legal in China, India, Indonesia, the Islamic Republic of Iran, Malaysia, Myanmar, Nepal, Singapore, and Thailand. In China the number of methadone maintenance treatment clinics increased from 128 to 320 between 2005 and 2006, and there was an increase from 130 to 392 in the number of needle and syringe exchange programme sites for IDUs over the same period.

Box 10. Interventions for injecting drug users in Myanmar and the Islamic Republic of Iran

Whereas Myanmar had virtually no services three years ago, there are now 14 drop-in centres for IDUs in the country, four of them having opened in 2005. These centres, run by national and international nongovernmental organizations with more than 100 outreach workers and 60 injecting drug use peer educators, reached 12 658 drug users in 2005.⁹² Significant progress has been made in the distribution of needles and syringes: 1 161 929 needles were distributed free of charge in 2005, more than twice as many as in the preceding year (545 000). The reported return rate was 80% of the needles distributed. Some of the findings of ad hoc studies in Lashio (North Shan State) suggest that programmes have already achieved an important impact in reducing risk behaviour: the reported sharing of injecting equipment fell from 44% to 23% between 2003 and 2005. In 2006 a methadone substitution programme was started in four areas with high prevalences of injecting drug use. Currently more than 190 patients have been enrolled and are followed in the methadone programme.

The Islamic Republic of Iran provides a good example of the scale-up of HIV prevention, treatment and care in prisons. There are some 137 000 IDUs in Iran.⁹³ HIV infection levels among IDUs are high: almost one in four IDUs participating in a recent study in Tehran was HIV-positive, and a history of using non-sterile injecting equipment in prison was the main factor responsible for infection.⁹⁴ In 2001 the triangular clinics concept was introduced to provide comprehensive and easily accessible HIV prevention, care and treatment services to vulnerable population groups, with a focus on IDUs. At the end of 2006 there were 55 triangular clinics in prisons, covering 33% of all prisons with such services, in addition to another 34 clinics in after-care centres. By January 2007 the triangular clinics were providing methadone maintenance therapy to 55% of prisoners in need and it is expected that they will cover 80%–99% within a year. The clinics also provide needle and syringe exchange and clean razors to prisoners, and a few are providing antiretroviral therapy. Information about HIV prevention for prison staff, prisoners and their families is regularly provided.

Little is known about needle and syringe exchange and OST in the Middle East, North Africa and sub-Saharan Africa. Evidence was found in December 2005 of the provision of OST in Israel and South Africa. In Latin America and the Caribbean, information on the existence of needle and syringe exchange has been found in Argentina, Brazil, Puerto Rico, and Uruguay. There is a methadone maintenance therapy programme in Mexico.

90 Donoghoe MC. 2006. Op. cit.

91 UNODC. 2006. Op. cit.

92 *Response to HIV and AIDS in Myanmar, Progress Report 2005*. Myanmar: Ministry of Health, National AIDS Programme; 2005.

93 Gheiratmand R, et al. Uncertainty on the number of HIV/AIDS patients: our experience in Iran. *Sexually transmitted infections* 2006;81:279-82.

94 Zamani S, et al. High prevalence of HIV infection associated with incarceration among community-based injecting drug users in Tehran, Iran. *Journal of AIDS* 2006;42(3):342-6.

2.5 The control of sexually transmitted infections to prevent HIV transmission

Evidence accumulated over the past two decades points to a strong association between sexually transmitted infections (STIs), particularly those characterized by genital ulcers, i.e. genital ulcer diseases (GUDs), and increased risk for the sexual transmission of HIV.⁹⁵ Many efficacious approaches to the prevention and control of STIs have been implemented in order to prevent the morbidity of STIs and possibly to decrease HIV incidence. The prevalence of certain major STIs (e.g. chancroid, syphilis and gonorrhoea) has fallen in many parts of the world. Simultaneously, however, there appears to have been an absolute increase in the incidence of herpes simplex virus type 2 (HSV-2) infection, and it has become the predominant cause of GUDs. Genital herpes has been associated with a twofold to threefold increased risk of HIV acquisition and with up to a fivefold increase of HIV transmission per sexual act, and may account for 40%–60% of new HIV infections in populations where there are high prevalences of HSV-2.^{96,97,98, 99, 100}

Despite the recognized influence of STIs in increasing HIV transmission, there has been uncertainty as to whether STI control leads to decreased HIV incidence. In July 2006 a meeting of experts in Geneva outlined the conditions under which STI treatment and other STI control interventions had an impact on HIV transmission at the individual and population levels, and the programmatic implications for STI and HIV programmes at the country level.¹⁰¹

Experience in various settings has demonstrated the impact that strengthened STI services can have on rates of STIs, especially among populations at increased risk of acquiring these infections, including HIV. In Botswana, for example, the prevalences of gonorrhoea, syphilis and chlamydia among family planning clients in 1993, before intensified treatment interventions for STIs were introduced, were 6.9%, 18.0 % and 19.6% respectively.¹⁰² In 2002, following enhanced national treatment interventions for STIs, but possibly influenced by other factors, the corresponding prevalences were 2.6%, 1.5%, and 12.3%. In Cotonou, Benin, before STI interventions in 1993, the prevalences of HIV, gonorrhoea, syphilis and chlamydia among sex workers were 53%, 43%, 9% and 8% respectively; by 2005, following the implementation of continuous interventions for STIs, HIV prevalence was 33%, the syphilis rate was below 1%, and the prevalence rates of gonorrhoea and chlamydia were 2.8% and 3.4% respectively (Fig. 17).¹⁰³

95 Fleming DT, Wasserheit JN. From epidemiological synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. *Sex Transm Inf* 1999;75:3-17.

96 Gray RH, Wawer MJ, Brookmeyer R, et al. Probability of HIV-1 transmission per coital act in monogamous, heterosexual, HIV-1-discordant couples in Rakai, Uganda. *Lancet* 2001;357:1149-53.

97 Wald A, Link K. Risk of human immunodeficiency virus infection in herpes simplex virus type 2-seropositive persons: a meta-analysis. *J Infect Dis* 2002;185(1):45-52.

98 Corey L, Wald A, Celum CL, et al. The effects of herpes simplex virus-2 on HIV-1 acquisition and transmission: a review of two overlapping epidemics. *J Acquir Immune Defic Syndr* 2004;35:435-45.

99 Freeman EE, Weiss HA, Glynn JR, Cross PL, Whitworth JA, Hayes RJ. Herpes simplex virus 2 infection increases HIV acquisition in men and women: systematic review and meta-analysis of longitudinal studies. *AIDS* 2006;20(1):73-83.

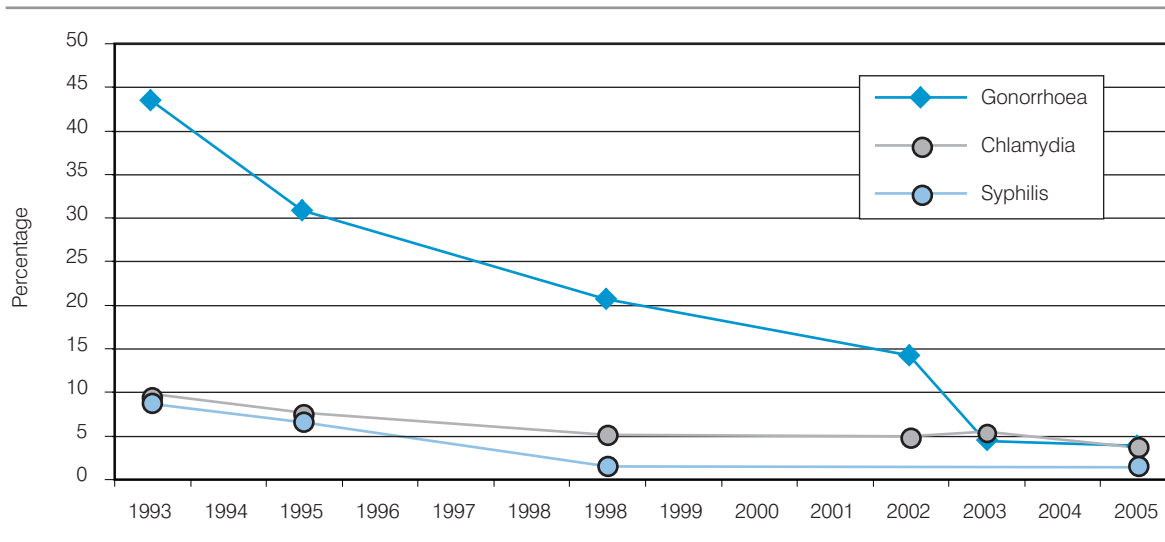
100 Strick LB, Wald A, Celum C. Management of herpes simplex virus type 2 infection in HIV type 1-infected persons. *Clin Infect Dis* 2006;3:347-56.

101 WHO/UNAIDS. *Consultation on STI interventions for preventing HIV: appraisal of the evidence*. Geneva: WHO and UNAIDS; 2007.

102 Paz-Bailey G, Rahman M, Chen C, et al. Changes in STD etiology in Botswana, 1993–2002: implications for management of genital ulcer disease. *Clin Infect Dis* 2005;41:1304-12.

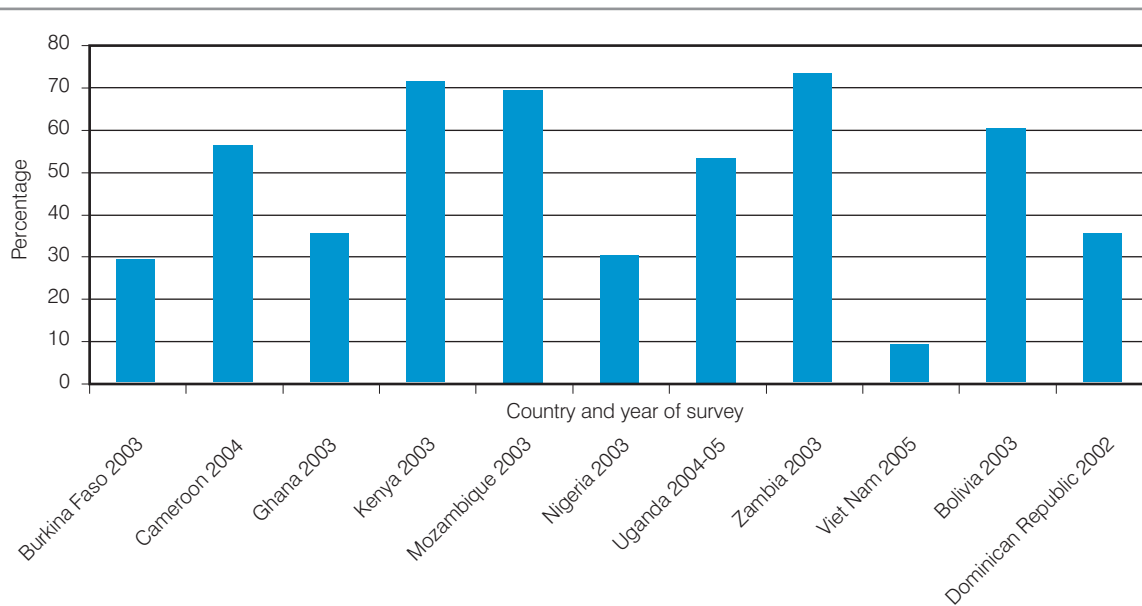
103 Labbé AC, et al. *A randomized placebo-controlled trial of routine monthly antibiotics against gonococcal and chlamydial infections among female sex workers in Ghana and Benin: intention-to-treat analysis*. Fifteenth Biennial Congress of the ISSTD, Ottawa, 27–30 July 2003 (updated).

Fig. 17. Time trends in prevalences of gonorrhoea, chlamydia, syphilis among female sex workers in Cotonou, Benin, 1993-2005



Source: Labbé AC, et al. Op cit.

Fig. 18. Percentages of men reporting symptoms of STIs in the last 12 months who sought care at a service provider with personnel trained in STI care, 2002-2005



Source: Demographic and Health Surveys (DHS), MEASURE DHS

In the Lao People's Democratic Republic, where services for sex workers were poor or non-existent, the prevalences at baseline for gonorrhoea or chlamydia or both were 42.7% in Oudomxai, 39.9% in Khammouane and 22.7% in Savannakhet. Following an intensive three-month intervention, the prevalences had fallen to 12.3%, 21.9% and 17.0% respectively.¹⁰⁴

104 O'Farrell N, Oula R, Morison L, Van CT. Periodic presumptive treatment for cervical infections in service women in three border provinces of Laos. *Sex Transm Dis* 2006; 33(9):558-564.

Genital herpes can also be treated. Current WHO treatment guidelines discuss conditions under which treatment should be available,¹⁰⁵ and a WHO consultation in 2006 recommended that HIV-positive people be particularly targeted for education so that they can detect this mostly asymptomatic infection and, if necessary, access treatment and suppressive therapy.¹⁰⁶ Research recently published shows that treatment of HSV-2 infection in HIV-infected individuals also lowers the plasma HIV RNA level to an amount that is likely to have a significant beneficial impact on the course of HIV infection.¹⁰⁷

The problem of genital herpes reflects the challenge of increasing the proportion of people who can recognize STI infections and seek services for care. It is probable that the majority of men and women with almost every STI are asymptomatic.¹⁰⁸ Furthermore, even if symptoms exist, findings from DHS surveys indicated that the proportions of men with suspected STIs who sought care from trained personnel varied between countries from about 10% to 70%, with a median of about 50% (Fig. 18). Thus only a small proportion of men with an STI obtained professional services. Women, more often asymptomatic than men, also have little knowledge of STI symptoms. In countries surveyed, less than half of ever-married women could name even one STI symptom in either a woman or a man.¹⁰⁹ The proportion of women who receive care for STIs is therefore likely to be even lower than that of men.

STI prevention and care services contribute to the achievement of universal access to HIV prevention, care and treatment by promoting the correct and consistent use of condoms, behavioural change, the empowerment of vulnerable populations, and, of course, the management of STIs. In addition to the scaling up of STI services it is necessary to improve screening and education for symptom recognition. Reliable STI prevalence data and HIV prevalence data, together with behavioural data that might explain trends in either, i.e. second-generation HIV surveillance, will be needed to optimize STI control and HIV prevention efforts in different settings.

2.6 Surveillance of the HIV/AIDS epidemic

HIV surveillance has been the cornerstone of country, regional and global estimates of HIV. The data obtained by HIV surveillance systems have provided key information for advocacy and policy decisions, including the targeting of prevention interventions and the provision of realistic estimates of care and treatment needs. The approaches to HIV/AIDS surveillance have evolved considerably since 1981, when the first AIDS cases were reported. In 2000, UNAIDS and WHO launched the HIV second-generation surveillance methodology for the improvement of HIV surveillance. This strategy promotes the adaptation of information systems to the epidemic characteristics of specific countries and links different sources of information, including data on sexual behaviour and HIV prevalence. Most countries have adopted this approach, although quality and trends have varied over time in different places.

An evaluation of the frequency and timeliness of data collection, the appropriateness of the systems used and the consistency of sites in 132 low- and middle-income countries provided useful insights into the quality of HIV surveillance systems:¹¹⁰ 44 countries had fully implemented surveillance systems, 42 had partially implemented them and 46 had performing systems that were poor relative to the recommendations made by the UNAIDS/WHO Working Group on Global HIV/AIDS and STI Surveillance. This represents a slight increase in the quality of surveillance systems globally over the last few years.

Concerns about the representativeness of surveillance sites and accuracy of national HIV estimates derived from antenatal clinic surveillance have led to an increased demand for population-based surveys that collect data on the prevalence and distribution of HIV in whole populations. New testing technologies, e.g. rapid tests and dried blood

105 WHO. *Guidelines for the management of sexually transmitted infections*. Geneva: World Health Organization; 2003.

106 WHO. *Guidelines on essential prevention interventions for adults and adolescents living with HIV infections in resource-limited settings*. Geneva: WHO; 2006 (report of a meeting held in Montreux, Switzerland).

107 Nagot N, Ouedraogo A, Foulongne V et al. Reduction of HIV-1 RNA levels with therapy to suppress herpes simplex virus. *N Engl J Med* 2007;336:790-9

108 Glasier A, Gulmezoglu AM, Schmid GP, Garcia Moreno C, Van Look PFA. Sexual and reproductive health: a matter of life and death. *Lancet* 2006;368:1-12.

109 Vadnais D, Kols A, Abderrahim N. *Women's lives and experiences: changes in the past ten years*. Calverton, Maryland: ORC Macro; 2006.

110 Garcia-Calleja JM, Zaniewski E, Ghys PD, Stanecki K, Walker N. A global analysis of trends in the quality of HIV sero-surveillance. *Sex Transm Infect* 2004;80:125-30. The data in this article has been updated in 2006 for the present report.

spot sampling, have also contributed to the trend in several countries to include HIV testing in national population-based surveys.¹¹¹ Over the last five years, over 20 national population surveys have been carried out, most of them in sub-Saharan Africa. Further results are expected for at least another ten national surveys in 2007.

Large-scale population-based surveys and sentinel surveillance both have weaknesses. For example, population-based surveys can provide useful information on HIV prevalence levels and distribution, but, because these surveys are typically conducted only every five years, they cannot predict trends in the same way as sentinel surveillance. National population surveys are most useful in generalized epidemics. They tend to underestimate HIV prevalence in countries or areas where most HIV transmission is concentrated in population groups with high-risk behaviours and where these groups are unlikely to be captured in the household-based sampling approach of population-based surveys.¹¹² Combining different sources of data yields more accurate estimates of HIV prevalence, and this approach is used by WHO and UNAIDS to regularly update HIV country estimates.

Additional refinements in data collection, analysis and reporting can further improve the assessment of the status and trends of the AIDS epidemic in countries and regions.

2.7 Progress in setting targets for universal access

In the political declaration made at the High-Level Meeting of the UN General Assembly in June 2006, countries committed themselves to developing ambitious targets for universal access, while acknowledging that country-level targets had to reflect local realities. Supporting countries to implement this commitment has been a major focus of international efforts led by UNAIDS. This has included the development and dissemination of operational guidance.¹¹³

By the end of 2006, 90 countries had provided target data on the outcome indicators proposed in the UNAIDS guidance paper. Eighty-one of these countries had set treatment targets and 84 had set outcome targets for at least one prevention intervention. Many countries are aiming to double or triple their treatment coverage by 2010 relative to the late 2005 baseline. Summaries are available of the country targets that have been set.¹¹⁴ Certain regional commitments have also been made in recent years and, in some cases, regional targets have been set.¹¹⁵

Although countries committed themselves to set targets by the end of 2006, many targets are still awaiting formal endorsement by national authorities, while other low-prevalence countries have only just begun the target-setting process. In addition, the need to align and integrate target-setting with national planning processes means that a number of countries will continue this process during 2007, when ongoing support will be provided by UNAIDS, WHO and other international partners for:

- completing the target setting-process, including consensus-building for joint action;
- updating national plans in line with universal access targets;
- providing support for resource mobilization and programme implementation; and
- developing one national monitoring and evaluation system in order to allow the monitoring of progress towards universal access.

UNAIDS will publish an updated report on the process of target-setting in mid-2007.

¹¹¹ Garcia-Calleja JM, Gouws E, Ghys PD. National population-based HIV prevalence surveys in sub-Saharan Africa: results and implications for HIV and AIDS estimates. *Sex Transm Inf* 2006;82:64-70.

¹¹² Op. Cit.

¹¹³ UNAIDS. *Setting national targets for moving towards universal access*. Geneva: UNAIDS; 2006.

¹¹⁴ <http://www.unaids.org/universalaccess/>

¹¹⁵ Examples are: the call for accelerated action towards universal access to HIV/AIDS, TB and malaria services in Africa made at the Special Summit of the African Union, held in Abuja on 2–4 May 2006; the commitment on scaling up towards universal access to HIV and AIDS prevention, treatment, care and support in Africa, African Union, Brazzaville, 8 March 2006; the Dublin Declaration on Partnership to fight HIV/AIDS in Europe and Central Asia, European Union Ministerial Conference, Dublin, 23–24 February 2004; the Vilnius Declaration on Measures to Strengthen Responses to HIV/AIDS in the European Union and in Neighbouring Countries, Vilnius, 17 September 2004; and the Declaration of Nuevo León, Special Summit of the Americas, Mexico, January 2004.

3. MAJOR CHALLENGES AHEAD

- ***Access to treatment continues to expand but significant obstacles to universal access must be overcome***

Universal access by 2010 will require a steep increase in the number of people starting treatment every year. The increase in the number of people on antiretroviral treatment in low- and middle-income countries over the last two years has been substantial. However, the annual rate of scale-up remains relatively stable, approximately 650 000 to 700 000 people starting treatment each year. If this rate of scale-up were to continue, less than 5 million people would be on treatment by 2010, whereas universal access would require at least 9.8 million people in low- and middle-income countries to be receiving treatment by that date.¹¹⁶ Further acceleration may be anticipated in the next few years, as some countries representing a high proportion of treatment need, e.g. India, Nigeria, and South Africa, have only relatively recently begun to scale up their programmes. On the other hand, some countries that have scaled up treatment programmes over a longer period began by treating the people who were easiest to reach, e.g. those in major urban areas, and in these countries a reduced rate of scale-up is possible in the absence of concerted efforts to reach semi-urban and rural areas, where the majority of people with HIV/AIDS live in Africa and large Asian countries.

Higher priority must be given to promoting, monitoring and evaluating equity of access to services. While there is considerable variation between countries, access to treatment for men and women globally appears to be relatively equitable. Access for men and women must, however, continue to be monitored, and special studies will be needed in order to help to understand uptake patterns, factors which inhibit or facilitate access to services for men and women, and potential differences in clinical outcomes.

While data on treatment access for most-at-risk populations are limited, especially for sex workers and men who have sex with men, there is evidence that IDUs continue to be significantly underserved by treatment programmes in many countries. Despite progress in a number of countries, it is necessary to achieve further integration of HIV treatment and care into substance dependence programmes and increased scale-up of harm reduction interventions.

Progress remains unsatisfactory in the prevention, diagnosis and treatment of HIV disease in children. The number of children with access to treatment has increased significantly over the last year, notably in Africa, but from a very low base, and overall coverage remains low in most low- and middle-income countries. The challenges of expanding access to treatment for children have been considerable, among them the difficulties of diagnosing HIV in infants and the cost and limited range of paediatric drugs.

In August 2006, WHO issued new guidelines on the care and treatment of HIV-infected children and on co-trimoxazole prophylaxis in HIV-exposed and infected children, which will help to standardize care in national programmes.^{117,118} The guidelines also outline the best dosages for infants with the range of existing products, and an expert group continues to work on defining an ideal range of antiretroviral products in low- and middle-income countries, including those that offer advantages for children (e.g. fixed-dose formulations).

Political commitment to addressing the needs of children with HIV is increasing, dedicated resources are being made available to finance the purchase of paediatric antiretroviral drugs, e.g. through the UNITAID initiative,¹¹⁹ and prices for these drugs have fallen significantly in the last year, largely through the efforts of the Clinton Foundation. New approaches to overcoming technical challenges are also being more widely explored, through, for example, routine HIV testing for sick children, the increased use of dried blood spot technology in infant diagnosis, and the development of fixed-dose paediatric formulations. These promising efforts should be accelerated so as to result in substantial gains in the prevention, diagnosis and treatment of paediatric HIV disease.

¹¹⁶ This represents a UNAIDS evaluation of 80% of people in the most urgent need. See: UNAIDS. *Resource needs for an expanded response to AIDS in low- and middle-income countries*. Geneva: UNAIDS; 2005.

¹¹⁷ WHO. *Antiretroviral therapy of HIV infection in infants and children in resource-limited settings: towards universal access: Recommendations for a public health approach*. Geneva: WHO; 2006.

¹¹⁸ WHO. *Guidelines on co-trimoxazole prophylaxis for HIV-related infections among children, adolescents and adults: Recommendations for a public health approach*. Geneva: WHO; 2006.

¹¹⁹ UNITAID is an innovative drug purchase financing mechanism supported by 23 countries, that are taking steps to introduce an air ticket solidarity levy or a similar mechanism: Benin, Brazil, Cambodia, Cameroon, Chile, Côte d'Ivoire, Cyprus, France, Gabon, Guinea, Jordan, Luxembourg, Madagascar, Mauritania, Mauritius, Mali, Nicaragua, Niger, Norway, Republic of the Congo, Republic of Korea, Spain, and the United Kingdom. See www.unitaid.eu

There is an urgent requirement for new approaches to service delivery which help to strengthen health systems. Continuing efforts are needed to overcome health system challenges if the rate of scale-up of antiretroviral treatment, prevention, care and support is to accelerate globally. The problems include a lack of physical infrastructure and severe constraints in respect of capacity and human resources at all levels, from national authorities to trained health care personnel at the district level and in primary health care settings. Countries seeking to scale up HIV/AIDS health services in order to achieve universal access will benefit by adopting a service delivery model that promotes a public health approach to the delivery of health services for HIV/AIDS^{120,121,122}. The public health approach promoted by WHO draws on the successful experiences of several countries in scaling up HIV/AIDS services and is based on the principles of simplification, standardization, decentralization, equity and patient and community participation.

The WHO Integrated Management of Adult and Adolescent Illness (IMAI) project, which promotes a public health approach to scale-up through an extensive series of training modules for health workers and administrators, is being implemented in 21 countries, 13 of them in sub-Saharan Africa. A number of countries are rapidly decentralizing IMAI implementation to the health centre level. Ethiopia, for example, trained 92 clinical teams in 2006. Other efforts, such as the “Treat, Train, Retain” project involving WHO, ILO, the United States Government, and other partners, are focusing specifically on addressing policy challenges connected with the HIV/AIDS health workforce, while the new initiative to establish wellness centres in several African countries aims to directly provide treatment, prevention and care to health workers living with or affected by HIV/AIDS and their families.

Treatment and prevention services must be scaled up in parallel. Even though the treatment gap has been decreasing in recent years, most of the estimated 39.5 million (34.1–47.1 million) people currently living with HIV/AIDS will eventually require treatment, and it is unlikely that the current global rate of scale-up will be able to keep pace with the ever-increasing need. It is clear that prevention efforts will have to be significantly scaled up if treatment programmes are to be sustainable over the long term.

Concerns about financial sustainability in the longer term are hindering progress. Such concerns continue to limit the scope and rate of scale-up in many countries, especially with reference to what will be available from major multilateral and bilateral sources in the long term. While countries increasingly recognize the importance of eliminating user fees for treatment at the point of service delivery, concerns about sustainability mean that user fees remain a barrier to treatment uptake and adherence in many countries.

Encouraging reductions have occurred in the price of first-line regimens in middle-income countries. However, as scale-up proceeds and first-line regimens begin to fail in some patients, the demand for second-line regimens will increase. Unless prices for second-line regimens fall significantly, countries will soon be confronted with budgetary constraints that may put treatment programmes at risk. It is vital to achieve further reductions in the prices of second-line drugs and to obtain more second-line generic alternatives.

Monitoring the benefits and impact of treatment is critical for ensuring continued international commitment. Notwithstanding the continuing challenges of scaling up antiretroviral treatment, there is growing evidence that treatment is having a positive impact on individuals and communities. Reductions in morbidity and mortality and improvements in the quality of life comparable to those seen in industrialized settings are being reported in an increasing number of low- and middle-income countries. It is essential to continue monitoring such outcomes in order to ensure sustained international commitment to HIV treatment. The impact component of the forthcoming five-year evaluation of the Global Fund to Fight AIDS, TB and Malaria will provide an important opportunity to estimate the overall effect of major international investments on infectious disease morbidity, mortality and infections averted.

¹²⁰ A public health approach addresses the health needs of a population or the collective health status of the people, rather than the needs of individuals.

¹²¹ WHO. *Towards universal access by 2010: How WHO is working with countries to scale up HIV prevention, treatment, care and support*. Geneva: WHO; 2006.

¹²² Gilks C, Crowley S, Ekpini R, Gove S, Perriens J, Souteyrand Y, Sutherland D, Vitoria M, Guerma T, De Cock K. The WHO public-health approach to antiretroviral treatment against HIV in resource-limited settings. *Lancet* 2006;368(9534):505-10.

It is also necessary to monitor the impact of treatment on sexual behaviour in order to enable appropriate adjustments to prevention interventions so that the increases in HIV transmission rates that have accompanied the introduction of antiretroviral treatment in many industrialized countries are avoided in low- and middle-income countries.

Countries should also put systems in place for the surveillance and monitoring of drug resistance and for pharmacovigilance with a view to informing national and global decision-making on the choice of treatment regimens.

- ***The health sector must intensify its efforts to increase access to prevention services for most-at-risk populations and people living with HIV/AIDS***

More effective outreach by the health sector to most-at-risk populations is urgently needed. Despite increased political commitment and increased access to services in some countries, global prevention intervention coverage for most-at-risk populations is still low. The health sector in particular has had limited success in addressing the needs of groups that are most at risk of HIV infection, and could do much more. Prevention initiatives, such as 100% condom use programmes, STI treatment and harm reduction interventions, including opioid substitution therapy, should be more systematically incorporated into HIV/AIDS treatment and care services, while HIV/AIDS information and counselling should feature more prominently in STI and reproductive health programmes, antenatal care, substance dependence services and primary health care settings. Achieving universal access requires that the health sector develop models of service delivery that reach out to at-risk populations. Moreover, the health sector should contribute more effectively to community-based services that provide effective outreach and targeted interventions.

The monitoring of programmes for most-at-risk populations should be further improved. Efforts in this area are only just beginning.

In the longer term the health sector should work with other stakeholders to create an enabling legal and policy environment for HIV prevention, treatment and care, including more rigorous efforts to address obstacles to implementation of prevention interventions, including stigma and discrimination.

The prevention needs of people living with HIV/AIDS must be addressed. An additional challenge for the health sector is to better address the prevention needs of people living with HIV/AIDS. Many people diagnosed in voluntary counselling and testing centres are lost to follow-up and only emerge again when they have advanced HIV disease. The health sector could provide a wider range of services and interventions so as to help people with HIV/AIDS to maximize their health, access antiretroviral therapy, prevent opportunistic and sexually transmissible infections, reduce the harms associated with injecting drug use, and avoid passing HIV on to others. Such services include information and counselling to prevent transmission to sexual partners, support for partner notification and beneficial disclosure, HIV testing and counselling for partners and children, preventive care (e.g. bednets for malaria prevention), co-trimoxazole prophylaxis, safe water, and screening and preventive therapy for TB.

- ***A concerted global effort is needed to accelerate the scale-up of comprehensive PMTCT interventions***

Comprehensive PMTCT services are lacking in most low- and middle-income countries. Whereas HIV transmission from mothers to infants has been virtually eliminated in industrialized countries, only limited progress has been made in scaling up comprehensive PMTCT services in low- and middle-income countries. Even though there is a well-defined set of interventions and the know-how to implement them, global coverage remains low, and many countries have not yet scaled up beyond initial pilot sites to national level programmes that integrate HIV/AIDS prevention, care and treatment for women and children, including PMTCT services, into antenatal, maternal, neonate and child health services. Poor coordination of donors and implementers, weak health systems and inadequate involvement of communities, male partners and civil society organizations have also contributed to the slow pace of scale-up.

It is necessary to scale up a comprehensive set of evidence-based interventions in order to achieve universal access to PMTCT. This includes: more systematic identification of HIV-positive pregnant women, especially in health care settings; the prevention of unintended pregnancies; the provision of antiretroviral drugs for treating

pregnant women and preventing MTCT; safer obstetric practices; family planning; and infant feeding counselling and support. A greater effort should be made to follow up HIV-exposed children and to determine the HIV status of all children born to mothers living with HIV/AIDS so that appropriate care and support can be provided.

Available guidance and know-how on PMTCT should be translated into action. New guidelines on antiretroviral drugs for treating pregnant women and preventing HIV infection in infants recommend that all HIV-infected pregnant women receive antiretroviral treatment if indicated.¹²³ These guidelines should help to standardize care. If treatment is not yet indicated for a mother, WHO recommends the use of a more efficacious regimen as prophylaxis (zidovudine + lamivudine + nevirapine) rather than the formerly recommended single-dose nevirapine, still used in some countries.

The global strategy on PMTCT and paediatric HIV care currently being developed by a UN Interagency Task Team will provide guidance to countries seeking to accelerate the scale-up of high-impact PMTCT interventions. Countries should now translate into action their numerous political commitments to prevent mother-to-child transmission.

- ***Infection control in health settings must be strengthened***

Both HIV and TB should be more effectively addressed through comprehensive infection control strategies in health care settings. Unintentional injuries inevitably happen in health care settings, although the frequency with which they result in exposure to HIV-contaminated fluids can be greatly reduced by the universal implementation of standard precautions. Countries should aim to achieve the universal elimination of exposure to HIV-contaminated fluids in health care settings by implementing measures to avoid the overuse of blood, reliance on remunerated or family blood donors, a lack of universal screening of transfused blood, the overuse of injections, the use of unsafe injections, and other unsafe practices. With regard to exposures that place individuals at risk of acquiring HIV, more should be done to ensure the universal availability of post-exposure prophylaxis in health care settings. The enlarging purview of the Safe Injection Global Network (SIGN) should be adequately resourced, and enhanced global efforts to improve blood safety should continue.

Recognition of the importance of preventing facility-based transmission of TB has been reinforced by recent experience with extensively drug-resistant TB (XDR-TB). Necessary measures for preventing TB transmission in health care settings include the rapid evaluation of patients suspected of having TB in outpatient settings, the separation of infectious TB patients from other inpatients, cough hygiene for patients, and environmental control, e.g. good ventilation and the use of ultraviolet light.

- ***A range of strategies is needed to increase knowledge of HIV status***

Continued scale-up of VCT services is necessary but obstacles to uptake must be overcome. HIV testing and counselling is a critical entry point to both prevention and treatment services but inadequate access to and uptake of these services continues to handicap efforts to expand HIV prevention and ensure timely access to treatment and care.

Client-initiated voluntary counselling and testing (VCT), in which a client or patient specifically requests an HIV test, has helped many people to learn their HIV status. However, the reach and uptake of these services remains inadequate. In many settings where health systems are weak and resources are limited the availability of testing and counselling services is constrained by shortages of skilled service providers, inadequate material resources, poor infrastructure, and inadequate procurement and supply management systems. Social factors such as individual attitudes and personal perceptions of risk also have a considerable effect on the uptake of VCT. Fears

¹²³ WHO. *Antiretroviral drugs for treating pregnant women and preventing HIV infection in infants. Towards universal access: recommendations for a public health approach*. Geneva: WHO; 2006.

related to stigma and negative reactions to disclosure create further barriers to testing,^{124,125,126,127,128} while gender inequalities contribute to delays in women learning their HIV status and increase the risk of discrimination and violence following disclosure of HIV-positive status.^{129,130}

These obstacles can be diminished by: improving the conditions under which testing and counselling are provided; supporting providers so that they have the information and resources needed for providing quality testing, counselling and referral services; improving their ability to foresee and prevent violence; increasing the use of peer counsellors; and improving communication between providers and clients. Uptake can also be increased if practical difficulties are removed, e.g. by enabling same-day results through the use of rapid tests, and if convenience for clients is increased, e.g. by offering testing and counselling at workplaces, in mobile clinics and during night hours.

The health sector must expand its role in HIV testing and counselling. In addition to scaling up VCT services, additional approaches to HIV testing and counselling may help to substantially expand knowledge of HIV status. Because health facilities represent a key point of contact with people who potentially have HIV, the initiation of testing and counselling by health care providers is emerging as a key strategy for expanding access to HIV prevention, treatment and care services. Provider-initiated HIV testing and counselling may be performed as part of the clinical management of patients who present with symptoms or signs of illness that could be attributable to HIV, as with the testing of TB patients and persons suspected of having TB. Health care providers may also recommend HIV tests to persons not presenting signs of HIV infection but who may benefit from knowing their HIV status; this includes the testing of pregnant women.

Draft WHO/UNAIDS guidance on provider-initiated testing and counselling in health care settings is currently in the consultation phase and will be released during the first half of 2007.

- ***It is necessary to improve the quality and breadth of strategic information***

Weak monitoring and evaluation systems are an obstacle to increased funding and more effective implementation.

Of the 137 countries reporting to UNAIDS on national HIV/AIDS responses in 2006, 46 indicated that they had established a national monitoring and evaluation framework and plan, and 27 described the process whereby this had been achieved. One of the major bottlenecks in the implementation of large country grants, such as Global Fund grants, is a weak monitoring and evaluation system, with inappropriate indicators, inadequate data collection systems, a lack of capacity to collect data at the local level, and an inadequate capacity for data analysis. As HIV services evolve, countries need support in revising and strengthening monitoring alongside the implementation of programmes. WHO is working with UNAIDS and other cosponsors and key stakeholders, including the Global Fund and the United States President's Emergency Plan for AIDS Relief, to identify the key national indicators, including the UNGASS indicators, which countries should be advised to collect in order to routinely monitor the HIV/AIDS response.

The available data on access to treatment, including the disaggregation of treatment recipients by sex and evidence of treatment outcomes, are gradually improving, but more extensive knowledge about treatment impact, toxicities, patterns of uptake and drug resistance will be needed to guide the scale-up and consolidation of treatment programmes in the coming years.

124 Ogden J, Nyblade L. *Common at its core: HIV-related stigma across contexts*. Washington DC: International Centre for Research on Women; 2005.

125 Weiser S, Wolfe W, Bangsberg D, Thior I, Gilbert P, Makhema J, et al. Barriers to antiretroviral adherence for patients living with HIV infection and AIDS in Botswana. *Journal of AIDS* 2005;34(3):281-8.

126 Day JH, Miyamura K, Grant AD, et al. Attitudes to HIV voluntary counselling and testing among mineworkers in South Africa: Will availability of antiretroviral therapy encourage testing? *AIDS Care* 2003;15(5):665-72.

127 Killewo JZ, Kwesigabo G, Comoro C, et al. Acceptability of voluntary HIV testing with counselling in a rural village in Kagera, Tanzania. *AIDS Care* 1998;10(4):431-9.

128 Laver SM. Voluntary testing and counselling for HIV. Are adults in rural communities ready to test? A descriptive survey. *Central African Journal of Medicine* 2001;47(4):92-7.

129 Maman S, Mbwambo J, Hogan NM, Kilonzo GP, Sweat M. Women's barriers to HIV-1 testing and disclosure: challenges for HIV-1 voluntary counselling and testing. *AIDS Care* 2001;13(5):595-603.

130 Paxton S, Gonzales G, Uppakaew K, et al. AIDS-related discrimination in Asia. *AIDS Care* 2005;17(4):413-24.

In most of the other intervention areas addressed in this report, data on access are not systematically collected and consolidated, or are available only through special studies. This includes data on the availability, coverage and impact of VCT and provider-initiated testing and counselling, interventions for most-at-risk populations, the prevention of mother-to-child transmission, and measures to prevent HIV transmission in health care settings.

The scale-up of antiretroviral treatment, PMTCT services and HIV testing and counselling has increased the numbers of adults and children being tested and diagnosed with HIV. More accurate data are needed on adults and children diagnosed with HIV so as to plan for effective prevention and care interventions, and assess such interventions. Countries should consider conducting reporting of advanced HIV disease in adults and children. Provider-initiated testing and counselling should increase the availability of data that can contribute to improved estimates of care needed at the local level. The completeness, timeliness and efficiency of this information would contribute to a better planning of health services.

Ambitious national targets and standards are needed to further mobilize action and increase accountability.

Although good progress has been made, the country-level target-setting process for universal access has not been completed in all countries. WHO is currently developing technical guidance on target-setting specifically for the health sector interventions of antiretroviral therapy, prevention of mother-to-child transmission, testing and counselling, and harm reduction interventions for IDUs. This guidance will be of use to countries that do not yet have targets in these areas or that wish to adopt a systematic approach to setting, reviewing or adjusting targets across intervention areas, for example when developing scale-up plans. Where possible, the guidance will propose standards for coverage, i.e. the optimal situation that countries should achieve when specific country obstacles have been overcome. Standards are based on scientific evidence if this is available or on experience gained in countries, including that gained in developed countries.

Timelines for achieving and maintaining standards will need to be set at the country level, depending on local constraints and opportunities. Countries will need to set ambitious targets for 2008 and 2010 as they progress towards the attainment of standards. The WHO guidance will also propose methods for reviewing the country context and assessing the possible impact of interventions in various target scenarios.

These guidance documents will be made available progressively during 2007.

Greater investment in operational research will help to increase the impact of programmes. Operational research can contribute to better strategic information. While surveillance determines the magnitude of problems, and monitoring and evaluation gauge changes in programme responses over time, operational research tries to find the best and most efficient means of implementing and conducting programmes. Because the public health approach to scale-up promoted by WHO alters a number of traditional approaches to health care delivery, much needs to be learnt about how it can be implemented most effectively in a range of settings. WHO is working with international research institutions and national AIDS programmes to determine the areas of greatest research need and is helping to direct expertise and funding to them.

- ***Male circumcision services should be recognized as an important intervention to reduce the risk of HIV infection***

In December 2006 the United States National Institutes of Health (NIH) announced that two trials assessing the impact of male circumcision on HIV risk were being stopped on the recommendation of the NIH Data Safety and Monitoring Board (DSMB). The trials, conducted in Kenya¹³¹ and Uganda¹³², were stopped after the DSMB evaluated the results of interim analyses and found an approximate halving of risk of HIV infection in men who were circumcised. These results supported the findings of the South Africa Orange Farm Intervention Trial, funded by the French Agence Nationale de Recherches sur le SIDA and published in 2005, which demonstrated a reduction of at least

131 Bailey RC, Moses S, Parker CB, Agot K, Maclean I, Krieger JN, Williams CF, Campbell RT, Ndinya-Achola JO. Male circumcision for HIV prevention in young men in Kisumu, Kenya: a randomized controlled trial. *Lancet* 2007;369:643-56.

132 Gray RH, Kigozi G, Serwadda D, Makumbi F, Watya S, Nalugoda F, Kiwanuka N, Moulton LH, Chaudhary MA, Chen MZ, Sewankambo NK, Wabwire-Mangen F, Bacon MC, Williams CF, Opendi P, Reynolds SJ, Laeyendecker O, Quinn TC, Wawer MJ. Male circumcision for HIV prevention in men in Rakai, Uganda: a randomized trial. *Lancet* 2007;369:657-66.

60% in HIV infection among circumcised men.¹³³ These results have heightened interest in male circumcision as an HIV prevention intervention and have led to an increased demand for male circumcision services.

In response to the findings of the trials, WHO, UNAIDS and their partners held an international consultation in early March 2007 with the goal of defining specific policy and programmatic recommendations for expanding and/or promoting male circumcision for HIV prevention. In addition to male circumcision being recognized as an important intervention to reduce the risk of HIV infection, experts at the consultation emphasized that in particular in countries with high HIV prevalence as a result of heterosexual transmission and low male circumcision rates, male circumcision could have a major impact on the HIV epidemic. It was recommended that these countries urgently consider expanding access to safe male circumcision services.

During the consultation addition to studying the data, the following factors were taken into account :

- cultural and human rights considerations associated with promoting circumcision;
- the risk of complications from the procedure performed in various settings;
- the potential to undermine existing protective behaviours and prevention strategies that reduce the risk of HIV infection;
- health systems constraints; and
- prevalence levels of HIV in populations that could potentially benefit from enhanced male circumcision services.

Male circumcision has now been demonstrated to offer partial protection against heterosexually acquired HIV infection in men. WHO and UNAIDS will actively support countries that decide to scale up safe male circumcision services by continuing to provide technical guidance, developing tools for determining the prevalence and acceptability of circumcision, evaluating the capacity of the health care system to scale up services, estimating costs, monitoring the numbers of circumcisions performed and their safety, monitoring the potential impact on sexual behaviour, and providing technical guidance on safe male circumcision practices, with training, standard-setting, certification and accreditation of the services. WHO is exploring ways to capitalize on the opportunity that male circumcision services could present for enhancing an important and neglected health care area, viz. the sexual and reproductive health (SRH) of men, through the coupling of SRH services with male circumcision services.

Information is currently lacking on the impact of male circumcision among HIV-infected men on HIV transmission to women.

- ***Tuberculosis presents major threats and opportunities for the response to HIV/AIDS***

The emergence of extensively drug-resistant tuberculosis (XDR-TB) in settings of high HIV prevalence, notably in southern Africa, is a serious threat to public health. This almost untreatable form of TB, resistant to the most powerful first-line and second-line anti-TB drugs, is rapidly fatal in people living with HIV/AIDS.¹³⁴ In March 2006, WHO and the United States Centers for Disease Control and Prevention reported that XDR-TB was a serious emerging threat to public health and TB control, raising concerns of TB epidemics with severely restricted treatment options which could jeopardize the gains made in global TB control. Furthermore, XDR-TB poses specific challenges to the global control of HIV/AIDS and could compromise the efforts of countries as they work towards universal access to HIV prevention, treatment and care.

Overall efforts to ensure that people living with HIV/AIDS have adequate access to quality TB prevention, diagnostic and treatment services are insufficient. Although XDR-TB is a serious threat, WHO estimates that less than 0.5% (30 000) of the 9 million new cases of TB disease that occur each year are attributable to XDR-TB. Most cases of TB are preventable or curable. Nevertheless, TB remains among the most common causes of illness

¹³³ Auvert B, Taljaard D, Lagarde E, Sobngwi-Tambekou J, Sitta R, et al. Randomized, controlled intervention trial of male circumcision for reduction of HIV infection risk: the ANRS 1265 trial. *PLoS Med* 2005;2(11):e298.

¹³⁴ Gandhi NR, et al. Extensively drug-resistant tuberculosis as a cause of death in patients coinfecting with tuberculosis and HIV in a rural area of South Africa. *Lancet* 2006;368(9547):1575-80.

and death in people living with HIV/AIDS. At least one in three people living with HIV (about 13 million) are infected with TB and at increased risk of developing active TB disease. As a result, almost one million people living with HIV will develop TB disease each year, leading to almost a quarter of a million avoidable TB deaths.¹³⁵ Chronic underinvestment and inadequate political commitment to TB control in many countries of high HIV prevalence have resulted in high TB incidence rates among people living with HIV/AIDS and contributed to the development of TB drug resistance.

Scaling up the provision of HIV care and antiretroviral treatment is both a threat and an opportunity for TB control in people living with HIV/AIDS. In the absence of adequate TB prevention and infection control measures,¹³⁶ HIV care and treatment centres provide a significant opportunity for the rapid spread of TB, and potentially drug-resistant TB, among the most vulnerable people living with HIV/AIDS. Antiretroviral treatment alone will not be enough to minimize the TB burden, since people living with HIV/AIDS who are on antiretroviral treatment remain at least twice as likely to develop TB disease as those who are HIV-negative.¹³⁷ However, expanded access to HIV care also offers greater opportunities to detect, treat and prevent TB in people living with HIV/AIDS, through TB screening and the treatment of latent TB infection. TB status should be assessed at each visit and can be recorded in the WHO-recommended HIV care and treatment registers. However, few countries are presently collecting and reporting the burden of TB among people living with HIV/AIDS or the proportion accessing preventive therapy.

Prioritizing access to high-quality TB prevention, diagnostic and treatment services will prevent the development and spread of drug-resistant TB and prolong the quality and quantity of life for people living with HIV/AIDS. TB prevention, diagnosis and treatment for people living with HIV/AIDS must be an integral and explicit component of efforts to achieve universal access. Unless greater attention is paid to TB and drug-resistant TB, they will offset the impact of the movement towards universal access to HIV/AIDS interventions and become the "Achilles heel of HIV treatment scale-up".¹³⁸

TB and HIV/AIDS programmes are increasingly collaborating to overcome the health system barriers to achieving their common goals, but opportunities are still being missed. The scale-up of comprehensive preventive, diagnostic, treatment and care services is being enhanced by a joint TB and HIV programme approach to: human resource capacity development; community involvement; drug supply management; and supervision, monitoring and evaluation. National TB programmes are increasingly being included as major partners in scaling up towards universal access by offering HIV testing to all TB patients, providing basic HIV prevention services to TB patients and ensuring that HIV-positive TB patients receive comprehensive HIV treatment and care. HIV/AIDS programmes are also incorporating TB screening and the treatment of latent TB infection into the continuum of care for people living with HIV/AIDS. However, many opportunities are still being missed to provide comprehensive services in both the TB and HIV care settings.

135 WHO. Global tuberculosis control: surveillance, planning, financing. Geneva: WHO; 2007 (WHO/HTM/TB/2007.376).

136 WHO and CDC. *Tuberculosis infection control in the era of expanding HIV care and treatment*. Addendum to WHO Guidelines for the prevention of tuberculosis in health care facilities in resource-limited settings (1999). Atlanta: Centers for Disease Control and Prevention; 2006.

137 Girardi E, Sabin CA, Monforte AD, et al. Incidence of tuberculosis among HIV-infected patients receiving highly active antiretroviral therapy in Europe and North America. *Clin Infect Dis* 2005;41:1772-82.

138 De Cock K. From "3 by 5" to Universal Access. Plenary presentation, Sixteenth International AIDS Conference, 2006.

4. SUMMARY OF PROGRESS IN SELECTED HIGH-BURDEN COUNTRIES

This section presents data on access to selected health sector interventions in seven high-burden countries: India, Kenya, Mozambique, Nigeria, South Africa, the United Republic of Tanzania, and Zimbabwe. In 2005 these countries accounted for more than half of the people living with HIV/AIDS globally, more than half of HIV-positive pregnant women and more than half of HIV-infected pregnant women who received antiretroviral prophylaxis for PMTCT. In December 2006 these countries also accounted for more than half of the need for antiretroviral treatment in low- and middle-income countries and were providing treatment to over 750 000 people, i.e. 37% of the number of people on treatment worldwide.

India

Total population, 2005: 1 103 370 000

Adult prevalence of HIV/AIDS, 2003: 0.9% (0.93%–1.5%); **2005:** 0.9% (0.91%–1.5%)

Antiretroviral therapy coverage, 2003: 3.0%*; **December 2006:** 6%–15%

Estimated % of HIV-infected pregnant women who received ARVs for PMTCT, 2005: 2% (1%–3%)

% of TB patients tested for HIV, 2005: 2.2%

Per capita total expenditure on health (Int. \$¹³⁹), 2003: 82

Sources: UN Population Division, WHO, UNAIDS, UNICEF.

* Based on estimated ART need in 2003 and refers to treatment provided through the private sector.

Between 3.4 million and 9.4 million adults and children were estimated to be living with HIV/AIDS in India in 2005. The epidemic is heterogeneous, with considerable regional variation. The states of Andhra Pradesh, Karnataka, Maharashtra, Manipur and Nagaland have generalized epidemics; others have concentrated or low-level epidemics. Vulnerable groups include sex workers, IDUs, men who have sex with men, and mobile population groups. The dominant mode of transmission is heterosexual sex, except in the north-eastern states, where injecting drug use is the principal mode. A national population-based survey conducted in 2006 is expected to provide further information on HIV prevalence levels in five of the most affected states, and nationally.

A multi-stakeholder consultation process undertaken in 2006 identified opportunities for and obstacles to scaling up HIV/AIDS services, and set national targets for progressing towards universal access within the framework of the National AIDS Control Programme 2006–2011. The targets aim to provide, by 2010, antiretroviral therapy to 62% of adults and children with advanced HIV infection, and antiretroviral prophylaxis to 100% of pregnant women. In the public sector, health services are provided free of charge at the primary, secondary and tertiary levels. There is also a large fee-levying private sector, which accounts for 82% of outpatient visits, 58% of inpatient expenditure and 40% of births in institutions.¹⁴⁰

Until 2003, antiretroviral therapy was available mostly through private sector providers or nongovernmental agencies. In December 2003 a policy of providing antiretroviral therapy through the public sector was introduced, and government hospitals were identified in six high-prevalence states to deliver it.

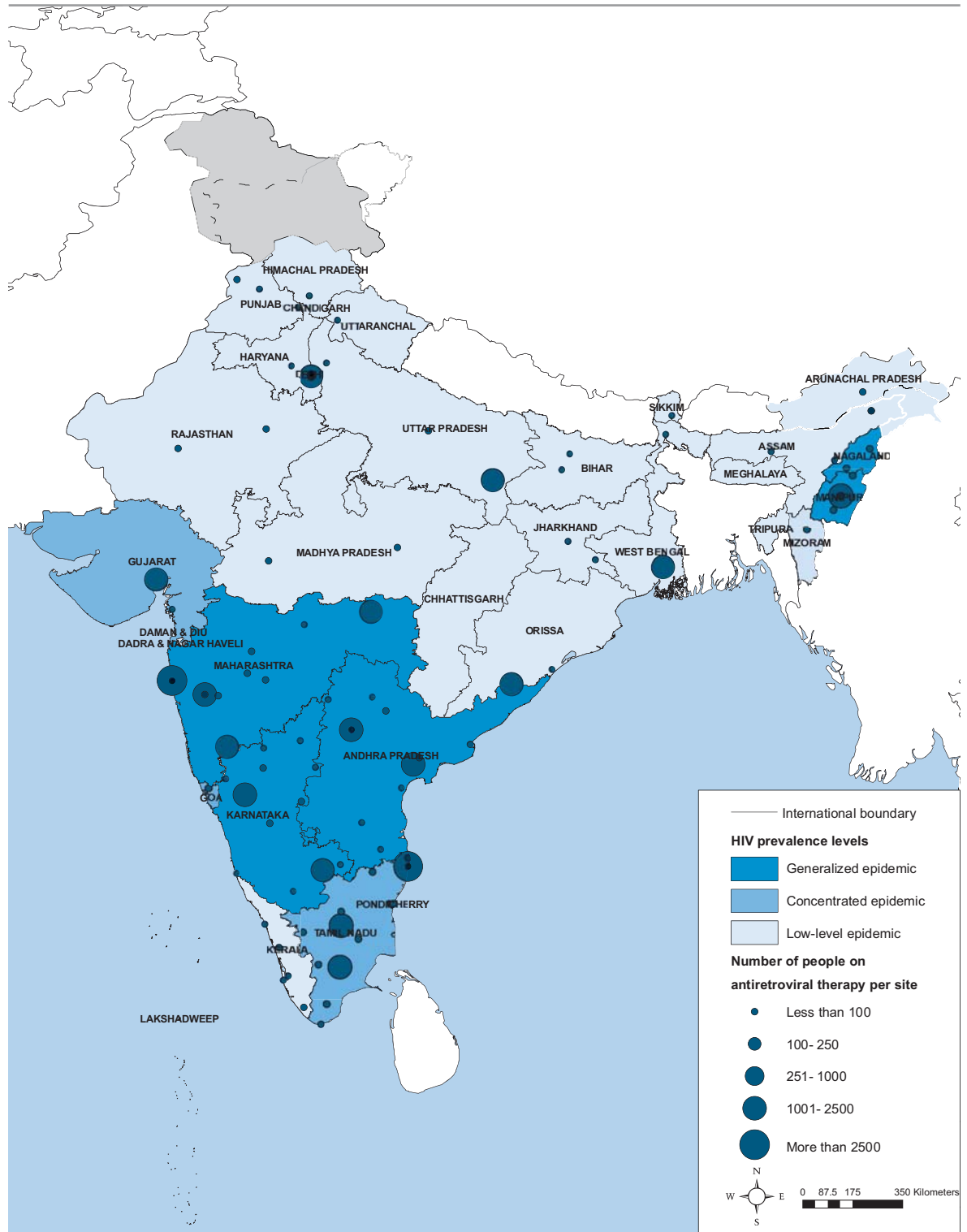
Access to treatment has increased gradually since 2004. By December 2006, 55 473 people were receiving antiretroviral therapy through the public sector at 111 sites (Fig. 19). About 15 000 people were treated at nine sites by nongovernmental and private centres. Moreover, it was estimated that 25 000 people were treated in the unorganized private sector. Overall, approximately 95 000 (77 000–114 000) people were receiving antiretroviral therapy by the end of 2006, including people enrolled through private facilities. However, this is far short of the total need. The government has also recently launched a paediatric antiretroviral therapy programme, supported by the Clinton Foundation, with the target of providing treatment to 40 000 children by 2011. In 2006, data from public sector facilities indicated that 81% of patients were alive and on treatment after 12 months and that 73% were alive and on treatment after 24 months.¹⁴¹

¹³⁹ The international dollar is a hypothetical unit of currency with the same purchasing power as the US dollar in the USA at a given point in time, i.e. it represents the US dollar converted at purchasing power parity exchange rates. It shows how much a local currency unit is worth in a given country and is used to make comparisons both between countries and over time. Thus, for example, by using the per capita gross domestic products of various countries in international dollars a more valid measure is provided for comparing standards of living than would be obtained if exchange rates were used.

¹⁴⁰ Sengupta A, Nundy S. The private health sector in India. *British Medical Journal* 2005;331:1157-8.

¹⁴¹ Khara A, Dharamshaktu NS, Rewari BB, Tassie J, Chan P, Mahanty B, Garg R. *Effectiveness of India's public sector antiretroviral treatment programme*. NACO and WHO; Poster Presentation at the Sixteenth International AIDS Conference, 2006.

Fig. 19. Antiretroviral therapy service delivery sites in India, December 2006



Source: National AIDS Control Organization, Ministry of Health and Family Welfare, India

Public sector programmes for the prevention of mother-to-child transmission of HIV began in December 2002. By December 2006, PMTCT services were being offered at 2433 health facilities. The coverage of these services remains low, only 3.9% of all pregnant women accessing them in 2005¹⁴² and 2% (1-3%) of HIV-infected pregnant women receiving antiretroviral prophylaxis to prevent transmission to their children.

The first centres for voluntary HIV counselling and testing were established during 1997 in state medical colleges and district hospitals. The number of VCT centres rose from 63 in 1997 to over 3000 by the end of 2006, with at least one site in each of the 600 districts. Around 3.03 million people were tested for HIV at public sector sites between 2002 and 2005, of whom 13% were found to be HIV-positive.¹⁴³ Among TB case notifications in 2005, 2.2% were tested for HIV and 21.6% of these were HIV-positive.

Successful projects targeting sex workers have been implemented in the high-prevalence states of West Bengal, Tamil Nadu, Maharashtra and Andhra Pradesh. Data from a primary prevention project among sex workers in Sonagachi, West Bengal, introduced in 1992, show that HIV prevalence among sex workers has remained below 10%, and that rates of condom use increased to 90%.¹⁴⁴ The Avahan India AIDS Initiative project, which supports nongovernmental organizations to organize outreach, community mobilization and dedicated clinics for sex workers, saw an increase in the number of clinics in targeted areas from about 50 in December 2004 to 350 in June 2006; furthermore, there was increased contact through peer outreach and an increased uptake of clinical services.¹⁴⁵ Some harm reduction programmes, including needle and syringe exchange and limited substitution therapy programmes, have been introduced in north-eastern states, where the primary mode of HIV transmission is injecting drug use.

In a country as large and populous as India, significant efforts are needed to scale up existing programmes and provide integrated prevention, treatment and care services to those in need, with a greater focus on state and district responses rather than on national responses. The private sector, which is a large provider of health services in India, should be better integrated with the public sector, and mechanisms for monitoring the quality of services should be developed. The country's generic drug manufacturing industry also faces the challenge of compliance with international laws on intellectual property rights, including that of supplying the domestic antiretroviral drug market with generic versions of products that are patented or for which patents are pending.

Kenya

Total population, 2005: 34 255 000

Adult prevalence of HIV/AIDS, 2003: 6.8% (5.8%–7.7%); **2005:** 6.1% (5.2%–7.0%)

Antiretroviral therapy coverage, 2003: 5.0%*; **December 2006:** 44.0% (36%–56%)

Estimated % of HIV-infected pregnant women who received ARVs for PMTCT, 2005: 20% (17%–23%)

% of TB patients tested for HIV, 2005: 14.2%

Per capita total expenditure on health (Int. \$), 2003: 65

Sources: UN Population Division, WHO, UNAIDS, UNICEF.

* Based on estimated ART need in 2003.

Kenya has a generalized HIV epidemic. Between 1.1 million and 1.5 million people were living with HIV in 2005. There is evidence of a decline in HIV prevalence in recent years: national prevalence among adults dropped from 10% in the late 1990s to about 6% in 2005. The declining trend is largely attributed to behavioural changes resulting from large-scale prevention efforts that began in 2000, including delayed sexual debut, increased condom use and

142 *Progress report on the Declaration of Commitment on HIV/AIDS (UNGASS)*. National AIDS Control Organization, India, 2005. Accessed at: http://data.unaids.org/pub/Report/2006/2006_country_progress_report_india_en.pdf on 30 January 2007.

143 Khera A, Mahanty B, Mehrotra S, Lo Y. *National voluntary counselling and testing (VCT) programme in India - scaling-up quality VCT services*. NACO and WHO; Poster Presentation at International AIDS Conference, 2006.

144 I Basu, et al. HIV prevention among sex workers in India. *Journal of Acquired Immune Deficiency Syndromes* 2004;36(3):845-52.

145 *Scaling up HIV prevention, care and treatment*. Report of a Regional Meeting, Bangkok, Thailand, 31 October to 2 November 2006. WHO/SEARO; 2007.

reduced rates of sex with multiple partners.¹⁴⁶ On the other hand, injecting drug use has been observed as an emerging factor in HIV transmission.

The national response to HIV/AIDS is guided by the National HIV/AIDS Strategic Plan 2005–2010. A multi-stakeholder national consultative process undertaken in 2006 identified opportunities and obstacles for scaling up HIV/AIDS services and set targets for progressing towards universal access to HIV prevention, care and treatment, including the provision by 2010 of antiretroviral therapy to 75% of men and 80% of women with advanced HIV infection, and of antiretroviral prophylaxis to 80% of infected pregnant women. A commitment was also made to ensuring that, by the same year, 2 million people, including those most at risk, would have received an HIV test and learnt the test results in the preceding 12 months. During 2007, these targets will be integrated within the framework of the National Strategic Plan. HIV/AIDS services are provided through public health facilities at the national, provincial, district and subdistrict levels. Missionaries and nongovernmental organizations also provide health services in collaboration with the government.

The provision of antiretroviral therapy began at five pilot sites during 2001. In 2002 a national task force was established to scale up the provision of antiretroviral therapy, and legislative provisions were made to reduce the cost of imported generic antiretroviral drugs. At the end of 2004 it was estimated that 17 000 people were receiving antiretroviral therapy through the public sector, nongovernmental organizations and mission facilities, and that 8000 were receiving treatment through private facilities. The provision of antiretroviral therapy was made free of charge in all public health facilities in 2006. By the end of that year it was estimated that some 125 000 people (111 000–139 000) were receiving antiretroviral therapy through public and private facilities, the estimated coverage being 44% (36%–56%). Positive outcomes of the expansion of antiretroviral therapy programmes have been observed. A study undertaken among all members of the households of 191 adult patients receiving antiretroviral therapy at a clinic in western Kenya between March 2004 and February 2005 found that treatment resulted in a rapid increase in employment for patients, as well as reduced labour among boys in the age group 8–12 years who were members of the patients' households.¹⁴⁷ Recently, attention has been focused on expanding the provision of paediatric antiretroviral therapy.

Services for the prevention of mother-to-child transmission were introduced at pilot sites in 2000. A national PMTCT programme began in 2002. By the end of 2005 there were 759 facilities providing PMTCT services in the public sector.¹⁴⁸ It was estimated that 20% (17%–23%) of HIV- positive pregnant women received antiretroviral prophylaxis in 2005.

Since 2000 there has been a significant expansion in the availability and coverage of testing and counselling services. These services are available both at stand-alone sites and integrated into public health facilities. The number of public sector sites increased from three in 2000 to 650 in 2005. The uptake of services increased during the same period: 1000 clients sought voluntary counselling in 2000 and 500 000 did so in 2005.¹⁴⁹ A population-based survey conducted in 2003 found that 14% of men and 13% of women had ever been tested for HIV and received the results of the test. The survey also revealed that 48% of women and 62% of men had heard of voluntary counselling and testing, and that knowledge was highest among people aged 20–24 years and people in urban areas.¹⁵⁰

Efforts have been made to improve the management of HIV/TB coinfection. In 2005, 14.2% of TB notifications were tested for HIV, of which 57.4% tested positive. Of the patients who tested positive nearly 80% were reported to have started on co-trimoxazole preventive therapy and 20% to have started on antiretroviral therapy.

¹⁴⁶ Cheluguet B, Baltazar G, Orege P, Ibrahim M, Marum LH, and Stover J. Evidence for population-level declines in adult HIV prevalence in Kenya. *Sexually Transmitted Infections* 2006;82(2): 21-26.

¹⁴⁷ Thirumurthy H, Graff Zivin J, Goldstein MP. *The impact of antiretroviral therapy on employment outcomes of HIV-infected individuals and their families: evidence from rural western Kenya*. International AIDS Conference 2006. Abstract TUAD0203.

¹⁴⁸ United Nations General Assembly Special Session on HIV/AIDS. Country report, Republic of Kenya, 2005. Accessed at: http://data.unaids.org/pub/Report/2006/2006_country_progress_report_kenya_en.pdf on 2 February 2007.

¹⁴⁹ United Nations General Assembly Special Session on HIV/AIDS. Country report, Republic of Kenya, 2005. Accessed at: http://data.unaids.org/pub/Report/2006/2006_country_progress_report_kenya_en.pdf on 2 February 2007.

¹⁵⁰ Kenya Demographic and Health Survey 2003. Central Bureau of Statistics and Ministry of Health (Kenya), and ORC Macro: 2004.

Significant progress has been made in recent years in managing the HIV epidemic and expanding access to essential health services for people living with and affected by the disease. However the country's health system faces a shortage of trained human resources, especially in rural areas. Moreover, it is necessary to strengthen the health infrastructure in order to provide adequate services. Treatment literacy is low, and stigma and discrimination remain high. Programme management and monitoring and evaluation systems also need to be strengthened.

Mozambique

Total population, 2005: 19 792 000

Adult prevalence of HIV/AIDS, 2003: 16.0% (12.5%–19.7%); **2005:** 16.1% (12.5%–20.0%)

Antiretroviral therapy coverage, 2003: 1.5%*; **December 2006:** 14% (10%–19%)

Estimated % of HIV-infected pregnant women who received ARVs for PMTCT, 2005: 6% (4%–9%)

% of TB patients tested for HIV, 2005: not available

Per capita total expenditure on health (Int. \$), 2003: 45

Sources: UN Population Division, WHO, UNAIDS, UNICEF.

* Based on estimated ART need in 2003.

Mozambique has a generalized HIV epidemic. HIV prevalence in pregnant women in the age group 15–49 years rose from 11% in 2000 to 16% in 2004, one of the steepest increases observed in sub-Saharan Africa in recent years. Between 1.4 million and 2.2 million people were living with HIV in 2005. The primary mode of transmission is heterosexual sex. The national prevalence masks considerable regional differences, the levels of infection in the southern and central provinces being comparatively high.¹⁵¹

The National Health Sector Strategic Plan to Combat Sexually Transmitted Infections and HIV/AIDS for 2004–2008 lays down the framework for expanding HIV services in the health sector. A multi-stakeholder national consultative process undertaken in 2006 identified opportunities and obstacles for scaling up HIV/AIDS services and established targets for progressing towards universal access, including the provision of antiretroviral therapy to 39% of adults and children with advanced HIV infection and the provision of antiretroviral prophylaxis to 22% of HIV-positive pregnant women by 2009. A further target was that, by 2008, 945 000 people, including those most at risk, should have received an HIV test and its result in the preceding 12 months. HIV/AIDS services are provided through a model of integrated health networks within the public health care system, providing key interventions for prevention, care, treatment and support, including condom distribution, treatment and care for sexually transmitted infections and opportunistic infections, counselling and testing, prevention of mother-to-child transmission, laboratory services, TB services, and community-based and home-based care. The nongovernmental sector is also a large provider of health services.

Antiretroviral therapy became available in 2003 and has mainly been provided through the public sector and by nongovernmental organizations. At the end of 2004, between 6500 and 8000 people were receiving antiretroviral therapy. By the end of 2006 it was estimated that there were 40 000 people (38 000–42 000) receiving antiretroviral therapy, a coverage of 14% (10%–19%) of those in need. The national strategic plan identified 129 public health facilities for the provision of antiretroviral therapy by the end of 2008. The number of public sector sites providing antiretroviral therapy increased from eight at the end of 2003 to 55 by August 2006. The geographical distribution of the sites is uneven, there being a concentration in the southern region, where the capital city is located.

The national programme to prevent HIV transmission from mothers to children was established in 2000. Coverage of PMTCT services remains low, only 6% (4%–9%) of HIV-positive pregnant women receiving antiretroviral prophylaxis in 2005. At the end of 2005 there were 74 sites providing PMTCT services in 67 of the country's 146 districts. The scale-up of services has been highest in the central region and slowest in the northern region.

¹⁵¹ UNAIDS. *AIDS epidemic update*. Geneva:UNAIDS; 2006.

Voluntary counselling and testing services were introduced in the public sector in 2001 and expanded gradually from 66 sites at the end of 2003 to 158 by September 2006, covering 85 of the 146 districts. A population-based survey conducted in 2003 found that 4% of adult men and women had ever received an HIV test and learnt the results, and that 2% had received the test and the results in the preceding 12 months.¹⁵² Testing is confidential and HIV-positive patients are referred to day hospitals and community home-based care services within the integrated health networks.

The most critical challenge as the country scales up access to HIV/AIDS services is weak national capacity in the health sector, in respect of both human resources and infrastructure. In addition, health care facilities are concentrated in and around the capital and are difficult to access from remote rural areas. A lack of awareness about HIV and the existence of HIV services also constitutes a barrier to accessing prevention, treatment and care. Greater coordination is needed among health care providers including the state, the private sector, nongovernmental organizations and faith-based groups.

Nigeria

Total population, 2005: 131 529 000

Adult prevalence of HIV/AIDS, 2003: 3.7% (2.2%–5.5%); **2005:** 3.9% (2.3%–5.6%)

Antiretroviral therapy coverage, 2003: 3.3%*; **December 2006:** 15% (10%–26%)

Estimated % of HIV-infected pregnant women who received ARVs for PMTCT, 2005: <1 % (0%–1%)

% of TB patients tested for HIV, 2005: 10.4%

Per capita total expenditure on health (Int. \$), 2003: 51

Sources: UN Population Division, WHO, UNAIDS, UNICEF.

* Based on estimated ART need in 2003.

Nigeria has a generalized HIV epidemic, driven primarily by heterosexual transmission. Between 1.7 million and 4.2 million people were estimated to be living with HIV in 2005. Prevalence varies between states, ranging from 10% in the North Central zone and 8% in the South zone to less than 2% in the South-West and North-West zones.¹⁵³ Young people, especially young women, are particularly vulnerable. Factors contributing to the rapid spread of the epidemic include: low levels of condom use, especially among mobile populations; low perceptions of risk; poor health status; low rates of literacy; and stigma and discrimination. Injecting drug use is emerging as a new mode of HIV transmission.

Nigeria has adopted targets for progressing towards universal access in line with regional commitments,¹⁵⁴ aiming to provide, by 2010, antiretroviral therapy to 80% of adults and children with advanced HIV infection, and antiretroviral prophylaxis to 80% of HIV-positive pregnant women. The country also aims to ensure that 80% of people, including populations at risk, receive an HIV test and the result by 2010. These targets have been integrated into the National HIV/AIDS Strategic Framework 2005–2009. The responsibility for the delivery of health services in the public sector is shared between the federal, state and local governments. Health services are also delivered by the large private sector, faith-based organizations, and traditional medicine providers, which are often not well regulated.

In 2004 a national plan was launched to scale up public sector provision of antiretroviral therapy between 2005 and 2009. Between 12 000 and 15 000 people were receiving treatment through the public sector at the end of 2004. By the end of 2006 some 81 000 (75 000–86 000) were estimated to be receiving treatment. However, this corresponds to 15% of the people in need of treatment and the rate of scale-up has been slower than national projections indicated. Treatment sites are concentrated in urban areas, health facilities lack trained personnel, and, while treatment is provided free of charge at public sector sites, the cost of diagnostic tests remains high and unaffordable for many patients.

¹⁵² *Demographic and Health Survey, Mozambique, 2003*. National Statistics Institute, Mozambique, and ORC Macro; 2003

¹⁵³ UNAIDS. *AIDS epidemic update*. Geneva:UNAIDS; 2006.

¹⁵⁴ *Abuja call for accelerated action towards universal access to HIV/AIDS, tuberculosis and malaria services in Africa*. Special summit of African Union on HIV/AIDS, tuberculosis and malaria, Abuja, Nigeria, 2–4 May 2006.

The national programme for the prevention of mother-to-child transmission began in 2002 at 11 service delivery sites, mostly located in tertiary hospitals. The number of sites increased to 33 in 2005, with services including testing and counselling for pregnant women and antiretroviral prophylaxis.¹⁵⁵ State governments and nongovernmental organizations also support a number of sites, yet coverage remains very limited in relation to need. In 2005 some 4.4% of pregnant women attending antenatal care services were estimated to have HIV¹⁵⁶ and fewer than 1% (0%–1%) of HIV-infected pregnant women received antiretroviral prophylaxis.

Knowledge of HIV status and coverage of HIV testing and counselling services are low. The Demographic and Health Survey conducted in 2003 revealed that 14% of men and 6% of women had ever been tested for HIV and received the results of the test, and that 6% of men and 3% of women had received a test and result in the preceding 12 months.¹⁵⁷ Among TB notifications in 2005, 10.4% were tested for HIV; of these, 17.5% were HIV-positive.

Despite political commitment at the highest levels and efforts in recent years to scale up the national response, the coverage of basic health services for HIV prevention, care and treatment remains limited. A large country with a complex administrative structure, Nigeria faces the challenge of scaling up a coordinated response at the federal, state and local levels. The infrastructure and the skills for providing services are inadequate, especially in rural areas. Another problem is that the large private health sector is not linked to the state health system.

South Africa

Total population, 2005: 47 431 000

Adult prevalence of HIV/AIDS, 2003: 18.6% (16.6%–20.5%); **2005:** 18.8% (16.8%–20.7%)

Antiretroviral therapy coverage, 2003: 2.7%*; **December 2006:** 32% (27%–39%)

Estimated % of HIV-infected pregnant women who received ARVs for PMTCT, 2005: 30% (27%–33%)

% of TB patients tested for HIV, 2005: 22.5%

Per capita total expenditure on health (Int. \$), 2003: 669

Sources: UN Population Division, WHO, UNAIDS, UNICEF.

* Based on estimated ART need in 2003.

South Africa has a generalized HIV epidemic and the highest number of people living with HIV/AIDS. In 2005, between 4.9 million and 6.1 million people, including 240 000 children younger than 15 years, were living with HIV. Recent data show a continuing rising trend in HIV prevalence among pregnant women attending antenatal clinics. However, prevalence among young people appears to be stabilizing.¹⁵⁸ There is significant regional variation in the epidemic, the highest prevalence rates occurring in KwaZulu-Natal and Mpumalanga and the lowest in the Western Cape, Northern Cape and Limpopo.

In December 2006, South Africa announced a draft National HIV/AIDS Plan for 2007–2011. The Plan and its related targets are still being developed and will be released in the coming months. The delivery of health services is decentralized, and the provinces have developed their own HIV/AIDS programmes. Health services are also delivered by a large private sector and a network of civil society organizations.

Access to treatment and care for people living with HIV/AIDS has increased in the past few years. South Africa introduced antiretroviral therapy provision in the public sector in 2004. Treatment scale-up began slowly: between 37 000 and 62 000 people were receiving treatment at the end of 2004, including a private sector estimate of more than 35 000. At the end of 2005 there were between 178 000 and 235 000 people receiving treatment, including a private sector estimate of 90 000. These numbers were still far below the estimated need. Growing national and international concern about the response led to a renewed political commitment by the South African Government in late 2006 to roll out treatment.

¹⁵⁵ Nigeria UNGASS report, 2005. Accessed at: http://data.unaids.org/pub/Report/206/2006_country_progress_report_nigeria_en.pdf on 30 January 2007.

¹⁵⁶ Children and AIDS: A stocktaking report. UNICEF, UNAIDS, WHO; 2007.

¹⁵⁷ Nigeria Demographic and Health Survey, 2003. National Population Commission (Nigeria) and ORC Macro; 2004.

¹⁵⁸ UNAIDS. AIDS epidemic update. Geneva: UNAIDS; 2006.

The number of people receiving treatment through the public sector expanded significantly in 2006, and it was estimated that some 325 000 (287 000–363 000) were doing so at the end of the year.

Progress has been made in the provision of PMTCT services. The national programme for the prevention of mother-to-child transmission began in 2001. Between 2004 and 2005 the percentage of HIV-positive pregnant women who received antiretroviral prophylaxis increased from 22% to 30% (27%–33%). However, as HIV infection rates among pregnant women attending public antenatal care clinics in 2005 were as high as 30.2%,¹⁵⁹ efforts to scale up PMTCT services should be further intensified.

Services for voluntary testing and counselling are widely available in South Africa through public sector clinics, hospitals, nongovernmental organizations and private practitioners. While knowledge of HIV status among South Africans is higher than in most other high-burden countries, it is nevertheless low. A national household survey conducted in 2005 found that 30.3% of respondents had previously been tested for HIV and that the primary reasons for not being tested were related to a low perception of risk. The study revealed an increase in the uptake of testing and counselling over time; over two-thirds of previously tested respondents had undertaken the test again in the preceding two years.¹⁶⁰

Efforts to improve joint planning between HIV and TB programmes have also strengthened in recent years. In 2005, 22.4% of TB notifications were tested for HIV, and some 52% of these were HIV-positive. Of those who tested positive, all were reported to have started on co-trimoxazole preventive therapy and 33% were reported to have started on antiretroviral therapy. The national TB programme also reported that, of 223 632 people living with HIV, 18% were screened for TB and that 37% of these were diagnosed with TB.

As the country scales up the provision of essential HIV/AIDS services towards universal access it faces the challenges of training additional human resources and retaining existing personnel within the public health care system. The recent momentum in the scale-up of treatment must continue. An increased focus on HIV prevention is needed, as well as an expansion of delivery points for HIV testing and counselling which are linked to prevention, care and treatment services. Moreover, it is necessary to address issues related to stigma, the fear of treatment side-effects, and quackery.

South Africa faces new opportunities and challenges in its efforts to control the spread of HIV. The results of the South Africa Orange Farm Intervention Trial published in late 2005 revealed a reduction of at least 60% in HIV infection among circumcised men.¹⁶¹ If male circumcision is to be offered more widely as a means of preventing new infections, the safe and appropriate delivery of circumcision services must be ensured. There is also an emerging challenge of extremely drug-resistant TB, and this has the potential to undermine HIV/AIDS control efforts.

¹⁵⁹ UNAIDS. *AIDS epidemic update*. Geneva: UNAIDS; 2006.

¹⁶⁰ South African National HIV Prevalence, HIV Incidence, Behaviour and Communication Survey, 2005.

¹⁶¹ Auvert B, Taljaard D, Lagarde E, et al. Randomized, controlled intervention trial of male circumcision for reduction of HIV infection risk: the ANRS 1265 Trial. *PLoS Med* 2005;2:e298.

United Republic of Tanzania

Total population, 2005: 38 328 000

Adult prevalence of HIV/AIDS, 2003: 6.6% (5.9%–7.3%); **2005:** 6.5% (5.8%–7.2%)

Antiretroviral therapy coverage, 2003: 0.6%*; **December 2006:** 18% (15%–23%)

Estimated % of HIV-infected pregnant women who received ARVs for PMTCT, 2005: 6% (5%–7%)

% of TB patients tested for HIV, 2005: 3.9%

Per capita total expenditure on health (Int. \$), 2003: 29

Sources: UN Population Division, WHO, UNAIDS, UNICEF.

* Based on estimated ART need in 2003.

The United Republic of Tanzania has a severe generalized epidemic. In 2005 it was estimated that 1.4 million people (1.3–1.6 million) were living with HIV/AIDS. HIV prevalence has decreased slightly in recent years from 8.1% in 1995 to 6.5% in 2005. However, the prevalence levels are particularly high in some rural areas, and projections suggest that by 2010 the number of new infections in rural areas, where almost three-quarters of the country's population lives, could be twice as high as in urban areas if prevention efforts are not effective. Injecting drug use is emerging as a new cause of HIV infection.¹⁶²

The national response to HIV/AIDS is guided by the National Strategic Framework on HIV/AIDS 2003–2007, which has been complemented by the Health Sector Strategy on HIV/AIDS 2003–2006 in order to provide direction to the health sector response. With support from external partners in 2003, Tanzania also launched the National Operational Plan for Care and Treatment for HIV/AIDS 2003–2008 to scale up the provision of antiretroviral therapy. A multi-stakeholder consultative process undertaken in 2006 identified opportunities for and obstacles to scaling up access to HIV/AIDS services and set targets for progress towards universal access. These targets, which aim to provide antiretroviral therapy to 62% of adults and children with advanced HIV disease and antiretroviral prophylaxis to 100% of HIV-infected pregnant women by 2010, are being integrated within the National Strategic Framework. The health system is publicly owned for the most part and is complemented by services run by nongovernmental organizations and the private sector.

Public sector provision of antiretroviral therapy began in late 2003 with the preparation of 19 health facilities to deliver treatment. In 2004 a commitment was made to provide antiretroviral drugs free of charge in the public sector. The scaling up of the antiretroviral therapy programme began gradually: 2880 people received treatment at the end of 2004, of which 880 obtained services through public health facilities and approximately 2 000 did so from private facilities and research projects. At the end of 2005, between 20 000 and 23 000 people were receiving antiretroviral therapy through public and private facilities. Access to treatment increased more rapidly during 2006, by the end of which year it was estimated that 51 000 (48 000–54 000) people were receiving antiretroviral therapy, which meant that 18% (15%–23%) of those in need were being reached.

The number of facilities offering services for the prevention of mother-to-child transmission remains low. A survey in 2006 examined the availability of four components of PMTCT services: counselling and testing for pregnant women; antiretroviral prophylaxis for mothers and newborns; infant feeding counselling; and family planning counselling or referral. Only 13% of all health facilities offering services related to HIV/AIDS provided any of these four components of PMTCT.¹⁶³ Antiretroviral drugs are provided at a subsidized rate to HIV-positive pregnant women but the cost to patients remains high. In 2005, 6% (5%–7%) of HIV-infected pregnant women received antiretroviral prophylaxis to prevent transmission to their children.

The first voluntary counselling and testing centres in the public sector were introduced in 1989. The 2006 survey revealed that some 25% of health facilities offering services related to HIV/AIDS had provisions for conducting HIV tests or for having them conducted elsewhere, and for obtaining the results for follow-up with the patients.¹⁶⁴ At the

¹⁶² UNAIDS. *AIDS epidemic update*. UNAIDS; 2006.

¹⁶³ *Tanzania service provision assessment survey 2006. Preliminary report*. National Bureau of Statistics (Tanzania) and ORC Macro; 2007.

¹⁶⁴ Op. cit.

end of 2005 there were 527 public sector sites providing VCT services and there was at least one in every district.¹⁶⁵ A population-based survey in 2004 revealed that about 12% of men and women had ever taken an HIV test and learnt the result, and that 6% of women and 7% of men had been tested during the preceding year.¹⁶⁶

The coverage of HIV/AIDS services remains limited for various reasons, including: the large size of the country; the lack of infrastructure and trained health workers, especially in rural areas; the high cost of services. It is necessary to improve the links between facilities providing various HIV/AIDS-related services. Stigma remains widespread, restricting the number of people who access testing and counselling services.¹⁶⁷ Information systems for monitoring the progress and outcomes of the national programme should be expanded.

Zimbabwe

Total population, 2005: 13 009 000

Adult prevalence of HIV/AIDS, 2003: 22.1% (14.6%–30.4%); **2005:** 20.1% (13.3%–27.6%)

Antiretroviral therapy coverage, 2003: 2.1%*; **December 2006:** 15% (11%–22%)

Estimated % of HIV-infected pregnant women who received ARVs for PMTCT, 2005: 9% (6%–15%)

% of TB patients tested for HIV, 2005: not available

Per capita total expenditure on health (Int. \$), 2003: 132

Sources: UN Population Division, WHO, UNAIDS, UNICEF.

* Based on estimated ART need in 2003.

Zimbabwe has a generalized epidemic that is one of the most severe in sub-Saharan Africa. Recent evidence shows that the prevalence of HIV in adults is declining: infection levels among pregnant women attending antenatal care clinics fell from a range of 30%–32% in the early 2000s to 24% in 2004. The observed declines appear to be related to increased awareness and to behavioural changes, e.g. increased levels of condom use and a reduction in casual sexual relations with non-regular partners.^{168,169} However, the prevalence rate continues to be among the highest in the world, one in five adults living with HIV.

The Zimbabwe National HIV and AIDS Strategic Plan 2006–2010 provides the framework for scaling up HIV/AIDS services. A multi-stakeholder national consultation held in 2006 identified opportunities for and obstacles to scaling up access to HIV/AIDS services. It established targets for progress towards universal access to prevention, care and treatment services, including the provision by 2010 of antiretroviral therapy to 75% of adults and children with advanced HIV infection and the provision of antiretroviral prophylaxis to 90% of pregnant women with HIV. The delivery of health services is undertaken primarily by the public sector; services are also provided by faith-based organizations and the private sector.

In 2002 the government declared HIV/AIDS and the lack of treatment to be an emergency and committed funds to support the scale-up of antiretroviral therapy. A national plan to roll out antiretroviral therapy services was launched in 2004. At the end of that year, some 8000 people were receiving antiretroviral therapy, which was free of charge to about half of them, through 18 public sector facilities. Access to treatment has increased gradually. By the end of 2006, some 52 000 (47 000–56 000) people were receiving antiretroviral therapy; in September 2006, 40 545 of them were receiving it through the public sector. However, coverage in 2006 remained between 11% and 22% of those in need. In January 2007 the government made a commitment to ensuring a threefold increase in the number of people receiving treatment through public health sector facilities by the end of the year, with the goal of reaching about 160 000 people in need.

¹⁶⁵ Follow-up to the *Declaration of Commitment on HIV/AIDS (UNGASS), Country Report, United Republic of Tanzania, 2005*. Accessed at: http://data.unaids.org/pub/Report/2006/2006_country_progress_report_tanzania_en.pdf on 5 February 2007.

¹⁶⁶ *Tanzania Demographic and Health Survey, 2004–05*. National Bureau of Statistics (Tanzania) and ORC Macro; 2005.

¹⁶⁷ Follow-up to the *Declaration of Commitment on HIV/AIDS (UNGASS), Country Report, United Republic of Tanzania, 2005*. Accessed at: http://data.unaids.org/pub/Report/2006/2006_country_progress_report_tanzania_en.pdf on 5 February 2007.

¹⁶⁸ Mahomva A, et al. HIV prevalence and trends from data in Zimbabwe, 1997–2004. *Sexually Transmitted Infections* 2006;82(Suppl 1):136–41.

¹⁶⁹ Gregson S, et al. HIV decline associated with behaviour change in Eastern Zimbabwe. *Science* 2006;311(5761):664–6.

The national programme for the prevention of mother-to-child HIV transmission was initiated in 2002 to provide free counselling and testing and antiretroviral prophylaxis for pregnant women. In 2005 it was estimated that 9% (6%–15%) of HIV-positive pregnant women received antiretroviral prophylaxis. The number of public health institutions providing PMTCT services increased from 69 in 2002 to 800 at the end of 2004.¹⁷⁰ PMTCT services are also provided in the private sector.

Services for voluntary HIV testing and counselling are available in the public hospitals, as well as through stand-alone sites supported by national and international partners. There are limited data on the uptake of HIV testing and on knowledge of status. A population-based survey in 1999 found that 12% of women and 9% of men had previously been tested for HIV.¹⁷¹ A survey conducted in 2005–2006 is nearing completion. Data from eight voluntary counselling and testing sites established by Population Services International in collaboration with the Ministry of Health and Child Welfare, which had been continuously operational from 2000 to 2004, revealed that the number of clients increased from 9136 to 59 032 between these dates. HIV prevalence was consistently lower in men than in women. The proportion of clients who reported attending for testing and counselling because of their own or their partners' sickness rose from 7% in 2002 to 24% in 2004, suggesting an increasing awareness of the availability of treatment.¹⁷²

Zimbabwe's health system has been weakened in recent years because of economic instability and reduced international support, and this has hindered the scale-up of health services for HIV/AIDS prevention and control. The country faces a large shortage of human resources in the health sector, worsened by the emigration of trained health personnel to other countries and by the impact of HIV/AIDS. Rising prices and shortages of drugs and diagnostic supplies are also major constraints. Stigma surrounding HIV/AIDS remains an obstacle to the uptake of testing and to access to effective treatment and care.

170 Follow-up to the *Declaration of Commitment on HIV/AIDS (UNGASS), Zimbabwe Country Report 2005*. Accessed at: http://data.unaids.org/pub/Report/2006/2006_country_progress_report_zimbabwe_en.pdf on 1 February 2007.

171 *Zimbabwe Demographic and Health Survey, 1999*. Central Statistical Office (Zimbabwe) and Macro International Inc.; 2000.

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ANNEX 1 ESTIMATED NUMBERS OF PEOPLE RECEIVING AND NEEDING ANTIRETROVIRAL THERAPY AND COVERAGE PERCENTAGE IN WHO MEMBER STATES¹:
LOW- AND MIDDLE- INCOME COUNTRIES

Low- and middle-income countries	WHO region ^a	Reported number of people receiving antiretroviral therapy ^b	Month and year of report ^c	Average monthly increase in the number of people receiving antiretroviral therapy ^d	Estimated number of people receiving antiretroviral therapy, December 2006 ^b			Estimated number of people needing antiretroviral therapy, 2006 ^e			Estimated antiretroviral therapy coverage, December 2006 ^f		
					Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate
Afghanistan	EMR	0	Sep.06	0	0	<200	<100	<200	<100	<200	...	...	...
Albania	EUR	45	Oct.06	0	<200	<200	...	...	...	...	...	...	...
Algeria	AFR	575	Nov.06	13	600	<1 000	2 300	2 300	1 200	4 200	25%	14%	49%
Angola	AFR	5 834	Nov.06	218	6 000	8 000	66 000	66 000	38 000	100 000	10%	6%	17%
Antigua and Barbuda	AMR	114	Sep.06	6	<200	<200	...	...	...	...	...	...	...
Argentina	AMR	21 732 ^g	Sep.06	400	33 000 ^g	30 000 ^g	42 000	42 000	25 000	63 000	79%	53%	100%
Armenia	EUR	44	Sep.06	0	<200	<200	<500	<500	<1 000	<1 000	...	...	...
Azerbaijan	EUR	5	Nov.06	0	<200	<200	590	590	310	1 100	<1%	...	2%
Bangladesh	SEAR	53	Sep.06	2	<200	<200	1 700	1 700	1 000	2 600	<3%	2%	6%
Barbados	AMR	601	Sep.06	6	600	<1 000	710	710	380	1 200	87%	53%	100%
Belarus	EUR	453	Nov.06	30	500	<1 000	2 400	2 400	1 400	4 000	20%	12%	35%
Belize	AMR	381	Sep.06	18	400	<500	680	680	360	1 100	59%	36%	100%
Benin	AFR	7 417	Nov.06	217	8 000	5 500	20 000	20 000	12 000	30 000	38%	25%	62%
Bhutan	SEAR	13	Dec.06	1	<200	<200	<100	<100	...	<200	...	...	...
Bolivia	AMR	260	Aug.05	0	300	<500	1 100	1 100	610	1 800	24%	15%	43%
Bosnia and Herzegovina	EUR	19	Jan.06	0	<200	<200	...	...	...	...	...	...	...
Botswana	AFR	67 500	Sep.06	2 717	84 000 ^h	78 000 ^h	84 000	84 000	70 000	100 000	>95%	84%	100%
Brazil	AMR	180 000	Dec.06	769	180 000	171 000	210 000	210 000	130 000	320 000	85%	57%	100%
Bulgaria	EUR	196	Nov.06	4	200	<500	...	...	...	...	...	...	...
Burkina Faso	AFR	10 644	Jun.06	405	13 000	12 000	33 000	33 000	23 000	45 000	39%	29%	58%
Burundi	AFR	7 575	Aug.06	179	8 000	7 500	31 000	31 000	16 000	43 000	26%	19%	52%
Cambodia	WPR	18 256	Sep.06	651	20 000	19 000	...	...	12 000 ⁱ	36 000 ⁱ	...	56%	100%
Cameroon	AFR	23 838	Jun.06	492	27 000	25 000	110 000	110 000	84 000	130 000	25%	21%	32%
Cape Verde	AFR	158	May.06	5	200	<500	...	...	...	...	...	...	...
Central African Republic	AFR	2 860	Nov.06	120	3 000	2 000	49 000	49 000	21 000	79 000	6%	4%	14%
Chad	AFR	5 000	Sep.05	0	5 000	4 000	36 000	36 000	17 000	65 000	14%	8%	30%
Chile	AMR	7 324	Nov.06	33	7 000	5 500	8 900	8 900	5 600	13 000	83%	56%	100%
China	WPR	30 640	Dec.06	796	31 000	29 000	110 000	110 000	68 000	170 000	27%	18%	46%
Colombia	AMR	17 500	Sep.06	208	18 000	13 000	37 000	37 000	23 000	55 000	50%	33%	78%
Comoros	AFR	4	Sep.06	0	<200	<200	<100	<100	<100	<200	...	...	...

Congo	AFR	2 788	Sep 05	79	4 000	3 000	5 000	23 000	14 000	35 000	17%	11%	29%
Cook Islands	WPR	...	...	...	...	...	...	...	...	...	...	...	...
Costa Rica	AMR	7 300	Sep 06	526	9 000	8 000	10 000	1 900	960	3 300	>95%	95%	100%
Côte d'Ivoire	AFR	27 658	Sep 06	1 219	31 000	28 000	34 000	110 000	67 000	160 000	28%	19%	47%
Croatia	EUR	306	Dec 06	4	300	...	<500	...	...	...	...	...	...
Cuba	AMR	2 470	Sep 06	39	3 000	2 500	3 500	1 500	750	2 600	>95%	95%	100%
Czech Republic	EUR	580	Apr 06	0	600	...	<1 000	...	...	...	...	...	...
Democratic People's Republic of Korea	SEAR	...	...	...	...	...	...	...	...	...	...	...	...
Democratic Republic of the Congo	AFR	18 059	Sep 06	947	21 000	20 000	22 000	200 000	100 000	330 000	11%	6%	20%
Djibouti	EMR	578	Nov 06	20	600	...	<1 000	3 100	890	6 900	20%	9%	68%
Dominica	AMR	32	Sep 06	1	<200	...	<200	...	...	...	...	...	...
Dominican Republic	AMR	5 001	Dec 06	201	5 000	4 500	5 500	14 000	10 000	17 000	37%	30%	48%
Ecuador	AMR	1 700	Sep 06	15	2 000	1 500	2 000	5 200	2 700	9 200	34%	19%	66%
Egypt	EMR	200	Oct 05	0	200	...	<500	910	500	1 500	22%	13%	40%
El Salvador	AMR	3 206	Sep 06	44	3 500	3 000	3 500	8 500	5 400	13 000	39%	26%	62%
Equatorial Guinea	AFR	396	Nov 06	18	400	...	<1 000	1 800	1 200	2 300	24%	18%	34%
Eritrea	AFR	709	Dec 06	21	700	500	1 500	12 000	5 900	20 000	8%	5%	16%
Estonia	EUR	392	Nov 06	7	400	...	<500	...	900	3 100	...	13%	45%
Ethiopia	AFR	39 984	Sep 06	3 971	52 000	49 000	54 000	...	84 000	290 000	...	18%	62%
Fiji	WPR	...	...	...	...	...	...	<200	...	<200	...	...	...
Gabon	AFR	4 321	Dec 05	0	4 500	3 000	5 500	12 000	7 400	18 000	35%	24%	59%
Gambia	AFR	392	Sep 06	12	400	...	<500	3 500	1 800	6 000	12%	7%	23%
Georgia	EUR	214	Oct 06	5	300	...	<500	700	360	1 300	32%	18%	62%
Ghana	AFR	9 420	Nov 06	462	10 000	7 500	12 000	63 000	46 000	79 000	16%	13%	21%
Guatemala	AMR	6 030	Dec 06	40	6 000	5 500	6 500	12 000	6 900	17 000	52%	35%	88%
Guinea	AFR	1 774	Sep 05	0	2 000	1 500	2 000	17 000	11 000	24 000	10%	8%	16%
Guinea-Bissau	AFR	266	Aug 06	26	400	...	<500	6 300	3 300	10 000	6%	4%	11%
Guyana	AMR	1 579	Sep 06	67	2 000	1 500	2 500	2 500	960	5 000	72%	36%	100%
Haiti	AMR	8 036	Sep 06	190	9 000	7 500	9 500	22 000	13 000	33 000	39%	26%	67%
Honduras	AMR	4 444	Sep 06	15	4 500	4 000	5 000	11 000	6 000	19 000	40%	24%	75%
Hungary	EUR	402	Jan 06	3	500	...	<1 000	...	...	...	...	...	...
India	SEAR	55 473	Dec 06	4 671	95 000	77 000	114 000	...	630 000	1 600 000	...	6%	15%
Indonesia	SEAR	5 136	Dec 06	122	5 000	4 000	6 500	25 000	15 000	38 000	20%	14%	34%
Iran, Islamic Republic of	EMR	420	Jun 06	1	500	...	<1 000	8 400	4 700	14 000	5%	3%	9%
Iraq	EMR	0	Jun 06	0	0	...	...	...	...	...	0%	...	...

Low- and middle-income countries	WHO region ^a	Reported number of people receiving antiretroviral therapy ^b	Month and year of report ^c	Average monthly increase in the number of people receiving antiretroviral therapy ^d	Estimated number of people receiving antiretroviral therapy, December 2006 ^b			Estimated number of people needing antiretroviral therapy, 2006 ^e			Estimated antiretroviral therapy coverage, December 2006 ^f		
					Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate
Jamaica	AMR	2 345	Oct 06	71	2 500	2 000	2 500	4 500	2 400	7 300	56%	34%	100%
Jordan	EMR	45	Sep 06	0	<200		<200	<200		<500	...		
Kazakhstan	EUR	370	Nov 06	12	400		<500	3 700	1 900	6 700	10%	6%	20%
Kenya	AFR	120 026 ^k	Dec 06	5 000	125 000 ^k	111 000 ^k	139 000 ^k	290 000	220 000	350 000	44%	36%	56%
Kiribati	WPR	...		...	...			...			...
Kyrgyzstan	EUR	43	Nov 06	0	<200		<200	<500		<1 000	...		
Lao People's Democratic Republic	WPR	370	Jun 06	...	400		<500	<500		<1 000	...		
Latvia	EUR	235	Jan 06	0	300		<500	...	930 ^l	2 400 ^l	...	10%	25%
Lebanon	EMR	200	Dec 05	...	200		<500	<500		<1 000	...		>91%
Lesotho	AFR	14 579	Aug 06	772	18 000	16 000	19 000	57 000	49 000	66 000	31%	27%	36%
Liberia	AFR	715	Sep 06	27	800		<1 000	...			...
Libyan Arab Jamahiriya	EMR	450	Dec 05	0	500		<1 000	...			...
Lithuania	EUR	60	Apr 06	0	<200		<200	...		<1 000 ^l	...		30%
Madagascar	AFR	89	Nov 06	3	<200		<200	8 100	2 900	18 000	1%	<1%	3%
Malawi	AFR	69 295	Sep 06	3 500	81 000	77 000	85 000	190 000	90 000	300 000	43%	27%	89%
Malaysia	WPR	2 700	<05	...	2 700	2 500	3 000	12 000	6 400	22 000	22%	12%	42%
Maldives	SEAR	1	Dec 06	0	<200		<200	...			...
Mali	AFR	8 331	Jun 06	259	10 000	7 500	12 000	27 000	18 000	38 000	37%	26%	56%
Marshall Islands	WPR	...		...	...			...			...
Mauritania	AFR	400	Sep 05	0	400		<500	2 400	1 500	3 600	17%	11%	26%
Mauritius	AFR	120	Sep 05	0	<200		<200	<200		<500	...		
Mexico	AMR	35 000	Dec 06	313	35 000	26 000	44 000	46 000	26 000	76 000	76%	46%	100%
Micronesia, Federated States of	WPR	...		...	...			...			...
Mongolia	WPR	1	Nov 06	...	<200		<200	<100		<200	...		
Montenegro	EUR	18	Jan 06	...	<200		<200	...			...
Morocco	EMR	1 369	Nov 06	44	1 500	1 000	2 000	3 400	2 200	5 100	41%	28%	65%
Mozambique	AFR	34 172	Sep 06	1 879	40 000	38 000	42 000	280 000	200 000	380 000	14%	10%	20%
Myanmar	SEAR	4 845	Sep 06	150	5 000	4 000	6 500	76 000	40 000	130 000	7%	4%	13%
Namibia	AFR	26 300 ^l	Sep 06	1 278	32 000 ^l	30 000 ^l	34 000 ^l	45 000	21 000	73 000	71%	44%	100%
Nauru	WPR	...		...	...			...			...

Nepal	SEAR	472	Sep 06	19	500		<1 000	13 000	7 100	21 000	4%	2%	7%
Nicaragua	AMR	289	Sep 06	14	300		<500	940	520	1 500	35%	21%	64%
Niger	AFR	822	Sep 06	24	900		<1 000	16 000	7 300	28 000	6%	3%	12%
Nigeria	AFR	67 062	Sep 06	2 882	81 000 ^m	75 000 ^m	86 000 ^m	550 000	310 000	840 000	15%	10%	26%
Niue	WPR	...	...	...	...		...	...			...
Oman	EMR	225	Jan 06	0	200		<500	...			...
Pakistan	EMR	164	Nov 06	3	<200		<200	12 000	6 600	20 000	<1%		3%
Palau	WPR	...	...	...	...		...	...			...
Panama	AMR	2 893	Sep 06	14	3 000	2 500	3 000	4 200	2 700	6 200	70%	47%	100%
Papua New Guinea	WPR	701	Aug 06	21	800		<1 000	9 800	5 500	16 000	8%	5%	14%
Paraguay	AMR	1 018	Sep 06	42	1 100	1 000	1 500	1 800	920	3 200	64%	36%	100%
Peru	AMR	8 859	Nov 06	223	9 000	7 000	11 000	18 000	11 000	28 000	50%	33%	83%
Philippines	WPR	140	Apr 06	5	200		<500	1 900	1 100	2 800	10%	6%	16%
Poland	EUR	2 721	May 06	31	3 000	2 500	3 500	...	...		...
Republic of Moldova	EUR	339	Oct 06	12	400		<500	...	2 500 ¹	7 300 ¹	...	5%	15%
Romania	EUR	6 846	Dec 06	37	7 000	6 500	7 500	...	...		...
Russian Federation	EUR	15 000	Nov 06	588	16 000	15 500	16 500	140 000	86 000	220 000	11%	7%	18%
Rwanda	AFR	29 946	Sep 06	1 233	34 000	32 000	36 000	48 000	31 000	60 000	72%	57%	100%
Saint Kitts and Nevis	AMR	38	Sep 06	1	<200		<200	...			...
Saint Lucia	AMR	45	Sep 06	0	<200		<200	...			...
Saint Vincent and the Grenadines	AMR	74	Sep 06	2	<200		<200	...			...
Samoa	WPR	...	...	...	...		...	...			...
Sao Tome and Principe	AFR	17	Mar 05	...	<200		<200	...			...
Saudi Arabia	EMR	100	<05	...	<200		<200	...			...
Senegal	AFR	4 200	Dec 05	0	4 000	3 000	5 500	12 000	6 100	20 000	34%	21%	69%
Serbia	EUR	600	May 06	7	700		<1 000	...			...
Seychelles	AFR	43	Sep 05	0	<200		<200	...			...
Sierra Leone	AFR	1 178	Nov 06	88	1 300	1 000	1 500	9 400	5 200	15 000	14%	8%	24%
Slovakia	EUR	52	Jan 06	0	<200		<200	...			...
Solomon Islands	WPR	...	...	...	...		...	...			...
Somalia	EMR	49	Oct 06	1	<200		<200	8 800	4 200	17 000	<1%		1%
South Africa	AFR	181 754	Sep 06	11 000	325 000 ⁿ	287 000 ⁿ	363 000 ⁿ	1 000 000	830 000	1 200 000	33%	27%	39%
Sri Lanka	SEAR	56	Dec 06	2	<200		<200	710	420	1 100	<8%	5%	13%
Sudan	EMR	731	Sep 06	5	800		<1 000	66 000	34 000	110 000	1%	<1%	2%
Suriname	AMR	622	Sep 06	21	700		<1 000	740	390	1 200	93%	56%	100%

Low- and middle-income countries	WHO region ^a	Reported number of people receiving antiretroviral therapy ^b	Month and year of report ^c	Average monthly increase in the number of people receiving antiretroviral therapy ^d	Estimated number of people receiving antiretroviral therapy, December 2006 ^b			Estimated number of people needing antiretroviral therapy, 2006 ^e			Estimated antiretroviral therapy coverage, December 2006 ^f		
					Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate
Swaziland	AFR	17 160	Oct 06	667	18 000	17 000	20 000	44 000	28 000	62 000	42%	30%	66%
Syrian Arab Republic	EMR	60	Dec 05	0	<200		<200	...			...
Tajikistan	EUR	26	Nov 06	1	<200		<200	500		<1 000	<5%		10%
Thailand	SEAR	89 496 ^o	Dec 06	1 900	112 000 ^o	81 000 ^o	143 000 ^o	130 000	67 000	210 000	88%	54%	100%
The former Yugoslav Republic of Macedonia	EUR	11	Oct 06	0	<200		<200	...			...
Timor-Leste	SEAR	0	Dec 06	0	0			...			0%		
Togo	AFR	5 600	Sep 05	0	6 000	4 000	7 000	23 000	13 000	36 000	24%	16%	44%
Tonga	WPR	...		...	...			...			...
Trinidad and Tobago	AMR	2 517	Dec 05	5	3 000	2 000	3 000	5 700	3 000	9 400	45%	28%	86%
Tunisia	EMR	40	Sep 06	0	<200		<200	...			...
Turkey	EUR	750	Nov 06	45	800		<1 000	...			...
Turkmenistan	EUR	0	Jan 06	0	0			<100		<200	...		
Tuvalu	WPR	...		...	...			...			...
Uganda	AFR	89 193	Sep 06	2 367	96 000	91 000	101 000	230 000	140 000	320 000	41%	30%	69%
Ukraine	EUR	4 767	Dec 06	131	5 000	4 500	5 500	...	...		...
United Republic of Tanzania	AFR	46 124	Oct 06	2 415	51 000	48 000	54 000	280 000	220 000	350 000	18%	15%	23%
Uruguay	AMR	1 425	Sep 06	2	1 500	1 500	2 000	2 800	1 500	5 100	51%	28%	98%
Uzbekistan	EUR	163	Jan 06	5	200		<500	...	1 800 ⁱ	6 400 ⁱ	...	3%	12%
Vanuatu	WPR	2	Oct 06	0	<200		<200	...			...
Venezuela, Bolivarian Republic of	AMR	15 417	Dec 05	100	17 000	12 000	21 000	23 000	12 000	42 000	71%	40%	100%
Viet Nam	WPR	6 564	Sep 06	250	7 000	6 500	7 500	42 000	25 000	63 000	17%	12%	29%
Yemen	EMR	0	Sep 06	0	0			...			0%		
Zambia	AFR	71 529 ^q	Seq 06	2 567	81 000 ^q	76 000 ^q	86 000 ^q	230 000	180 000	280 000	35%	29%	45%
Zimbabwe	AFR	40 545	Sep 06	1 746	52 000	47 000	56 000	350 000	230 000	480 000	15%	11%	22%

ANNEX 1 ESTIMATED NUMBERS OF PEOPLE RECEIVING AND NEEDING ANTIRETROVIRAL THERAPY AND COVERAGE PERCENTAGE IN WHO MEMBER STATES¹:
HIGH-INCOME COUNTRIES

High-income countries	WHO region ^a	Reported number of people receiving antiretroviral therapy ^b	Month and year of report ^c	Average monthly increase in the number of people receiving antiretroviral therapy ^d	Estimated number of people receiving antiretroviral therapy, December 2006 ^b			Estimated number of people needing antiretroviral therapy, 2006 ^e			Estimated antiretroviral therapy coverage, December 2006 ^f			
					Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate	
Bahrain	EMR	...	...	...	...	...	...	...	...	...	...	...	...	...
Belgium	EUR	6 073	Dec 05	...	...	...	...	...	...	...	...	...	...	...
Brunei Darussalam	WPR	...	...	...	...	...	...	...	...	...	...	...	...	...
Canada	AMR	21 000	Sep 06	...	...	...	...	...	...	...	...	...	...	...
Cyprus	EUR	126	<05	...	...	...	...	...	...	...	...	...	...	...
Denmark	EUR	2 764	Dec 05	...	...	...	...	...	...	...	...	...	...	...
Finland	EUR	1 020	Dec 05	...	...	...	...	...	...	...	...	...	...	...
France	EUR	58 000	Dec 05	...	...	...	...	...	...	...	...	...	...	...
Germany	EUR	26 600	Jun 06	...	...	...	...	...	...	...	...	...	...	...
Greece	EUR	3 130	Dec 05	...	...	...	...	...	...	...	...	...	...	...
Grenada	AMR	33	Sep 06	...	...	...	...	...	...	...	...	...	...	...
Iceland	EUR	65	Dec 05	...	...	...	...	...	...	...	...	...	...	...
Ireland	EUR	1 600	Dec 05	...	...	...	...	...	...	...	...	...	...	...
Israel	EUR	2 046	Dec 05	...	...	...	...	...	...	...	...	...	...	...
Italy	EUR	75 000	Dec 05	...	...	...	...	...	...	...	...	...	...	...
Japan	WPR	...	...	...	...	...	...	...	...	...	...	...	...	...
Kuwait	EMR	...	...	...	...	...	...	...	...	...	...	...	...	...
Luxembourg	EUR	304	Apr 06	...	...	...	...	...	...	...	...	...	...	...
Malta	EUR	48	Apr 06	...	...	...	...	...	...	...	...	...	...	...
Monaco	EUR	45	Dec 05	...	...	...	...	...	...	...	...	...	...	...
Netherlands	EUR	6 734	Dec 05	...	...	...	...	...	...	...	...	...	...	...
New Zealand	WPR	...	...	...	...	...	...	...	...	...	...	...	...	...
Norway	EUR	900	Dec 05	...	...	...	...	...	...	...	...	...	...	...
Portugal	EUR	9 000	Dec 05	...	...	...	...	...	...	...	...	...	...	...
Qatar	EMR	...	...	...	...	...	...	...	...	...	...	...	...	...
Republic of Korea	WPR	...	...	...	...	...	...	...	...	...	...	...	...	...
San Marino	EUR	18	Dec 05	...	...	...	...	...	...	...	...	...	...	...
Singapore	WPR	...	...	...	...	...	...	...	...	...	...	...	...	...
Slovenia	EUR	140	May 06	...	...	...	...	...	...	...	...	...	...	...
Spain	EUR	75 000	Dec 05	...	...	...	...	...	...	...	...	...	...	...

	EUR	2 500	Dec 05	...	...	...	...	...	...
Sweden	EUR	2 500	Dec 05	...	...	...	...	...	...
Switzerland	EUR	8 800	Dec 05	...	...	...	...	...	...
United Arab Emirates	EMR	...	...	...	...	...	...	...	...
United Kingdom	EUR	36 000	Jun 06	...	...	...	...	...	...
United States of America	AMR	268 000	<05	...	...	...	...	...	...

... Data not available or not applicable.

^a The World Health Organization has 193 Member States which are grouped in six regions. This table consists of two sections. The section with data for low- and middle-income countries includes data for 154 WHO Member States (AFR: WHO African Region (*n* = 46); AMR: WHO Region of the Americas (*n* = 31); EMR: WHO Eastern Mediterranean Region (*n* = 17); EUR: WHO European Region (*n* = 28); SEAR: WHO South-East Asia Region (*n* = 11); WPR: WHO Western Pacific Region (*n* = 21)). The other section of this table includes data for 39 high-income countries.

^b An increasing number of countries report the number of children younger than 15 years of age receiving antiretroviral therapy, and they have been included in this table. Breakdowns of ART data by age and sex are provided in Annex 2.

^c <05 means 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.

^d The monthly increase in the number of people receiving antiretroviral therapy during, in most cases, the last six months of 2006, is calculated using two data points in 2006 with the longest period between them and applying a linear projection for each month up to December 2006. Except for Argentina, India and Kenya, the calculated monthly growth rate only applies to the growth in the public sector.

^e The needs estimates are based on the methods described in Annex 2. The estimates for individual countries may differ according to the local methods used.

^f The coverage estimates are based on the estimated unrounded numbers of people receiving antiretroviral therapy and the estimated unrounded needs for antiretroviral therapy. Ranges in coverage estimates are based on plausibility bounds in the denominator, i.e. low and high need estimates. No coverage has been calculated where the need is estimated to be less than 500.

^g The national AIDS programme reported a public sector number of 21 732 for September to 2006. It is estimated that about 32 000 people were receiving antiretroviral therapy in September 2006, including those receiving treatment through private facilities.

^h Includes a private-sector estimate of 8500. The national health authorities reported a number of almost 67 500 for the public sector for September 2006.

ⁱ The estimated number of people needing ARV therapy is currently under review and will be adjusted, as appropriate, based on new data collected during 2006. Preliminary analysis suggests that the number of people needing ARV therapy lies within these ranges. UNAIDS and WHO will post new estimates on their websites as they become available.

^j By December 2006 the government reported that 55 473 people were receiving antiretroviral therapy through the public sector at 111 sites. About 15 000 people were treated in nine sites by NGOs and private centres. A further estimated 25 000 people were treated in the unorganized private sector. Overall, an estimated 95 000 [77 000–114 000] people were receiving antiretroviral therapy by the end of 2006, including people enrolled through private facilities.

^k A public-sector estimate of 120 000 people receiving antiretroviral therapy and a private-sector estimate of 5000 is based on numbers reported by the Ministry of Health.

^l The Ministry of Health and Social Services estimated that over 26 000 people were receiving antiretroviral therapy through public facilities by the end of September 2006. An estimated 2000 people were provided with antiretroviral therapy through the private sector in 2006.

^m Includes a private-sector estimate of 5000.

ⁿ Includes a private-sector estimate of 110 000. The Department of Health reported a cumulative number of 213 828 for the public sector in September 2006. WHO/UNAIDS adjusted the public sector number for attrition.

^o The Ministry of Health estimated that the number of people receiving antiretroviral therapy through private facilities was 25% of those enrolled through the public sector.

^p The estimated number of people needing ARV therapy is currently under review and will be adjusted, as appropriate, based on new data collected during 2006.

^q National health authorities reported that over 71 500 people were receiving antiretroviral therapy through the public sector in September 2006. An additional 2000 people were estimated to be receiving antiretroviral therapy through private facilities.

ANNEX 2. REPORTED ADULT MALES AND FEMALES, AND CHILDREN RECEIVING ANTIRETROVIRAL THERAPY, ESTIMATED NUMBERS OF ADULTS AND CHILDREN NEEDING ANTIRETROVIRAL THERAPY, AND COVERAGE PERCENTAGES IN LOW- AND MIDDLE-INCOME COUNTRIES^a

Country	WHO region ^b	Month and year of report	Reported number of adult males and females receiving antiretroviral therapy				Reported number of adults and children receiving antiretroviral therapy				
			Males (15+)	% of total	Females (15+)	% of total	Adults (15+)	% of total	Children (<15)	% of total	Total
Afghanistan	EMR	Sep 06	0		0		0		0		0
Albania	EUR	Dec 05	...		...		...		5 ^e	...	
Algeria	AFR	...	...		...		...		...
Angola	AFR	Dec 05	...		...		...		438 ^e	...	
Antigua and Barbuda	AMR	Sep 06	...		...		112	98%	2	2%	114
Argentina	AMR	Sep 06 ^f	12 532	63%	7 280	37%	19 812	91%	1 920	9%	21 732
Armenia	EUR	Sep 06	32	78%	9	22%	41	93%	3	7%	44
Azerbaijan	EUR	...	...		...		...		...
Bangladesh	SEAR	...	...		...		...		...
Barbados	AMR	Sep 06	322	55%	261	45%	583	97%	18	3%	601
Belarus	EUR	Jan 06 ^g	52	60%	35	40%	87	73%	32	27%	119
Belize	AMR	Sep 06	...		...		348	91%	33	9%	381
Benin	AFR	...	...		...		...		...
Bhutan	SEAR	...	...		...		...		...
Bolivia	AMR	...	...		...		...		...
Bosnia and Herzegovina	EUR	Jan 06	14	74%	5	26%	19	100%	0	0%	19
Botswana	AFR	Sep 06	21 254	35%	39 487	65%	60 741	90%	6 750	10%	67 491
Brazil	AMR	Dec 06	104 310	61%	66 690	39%	171 000	95%	9 000	5%	180 000
Bulgaria	EUR	Jan 06 ^g	96	63%	57	37%	153	98%	3	2%	156
Burkina Faso	AFR	Jun 06	...		...		10 181	96%	463	4%	10 644
Burundi	AFR	Dec 05 ^g	1 915	34%	3 718	66%	5 633	83%	1 137	17%	6 770
Cambodia	WPR	Sep 06	8 383	51%	7 996	49%	16 685	91%	1 571	9%	18 256
Cameroon	AFR	Jun 06	7 886	34%	15 228	66%	23 114	97%	724	3%	23 838
Cape Verde	AFR	May 06	52	38%	86	62%	138	87%	20	13%	158
Central African Republic	AFR	Sep 05 ^g	503	39%	791	61%	1 294	89%	160	11%	1 454
Chad	AFR	Dec 05	...		...		...		7 ^e	...	
Chile	AMR	...	...		...		...		...
China	WPR	Dec 06	16 565	55%	13 553	45%	30 118	98%	522	2%	30 640
Colombia	AMR	...	...		...		...		...
Comoros	AFR	Dec 05	...		...		...		1 ^e	...	
Congo	AFR	Dec 05	...		...		...		13 ^e	...	
Cook Islands	WPR	...	...		...		...		...
Costa Rica	AMR	Sep 06	5 300	73%	2 000	27%	...		...		7 300 ⁱ
Côte d'Ivoire	AFR	Sep 06 ^f	6 915	35%	12 824	65%	19 739	94%	1 184	6%	20 923
Croatia	EUR	Jan 06 ^g	207	80%	53	20%	260	100%	0	0%	260
Cuba	AMR	Sep 06	2 013	82%	441	18%	2 454	99%	16	1%	2 470
Czech Republic	EUR	Jan 06 ^g	440	80%	110	20%	550	99%	4	1%	554
Democratic People's Republic of Korea	SEAR	...	...		...		...		...
Democratic Republic of the Congo	AFR	Sep 06	8 325	48%	9 184	52%	17 509	97%	550	3%	18 059
Djibouti	EMR	Jun 06 ^g	216	50%	213	50%	429	98%	10	2%	439
Dominica	AMR	...	...		...		...		...
Dominican Republic	AMR	Dec 06	...		...		4 624	92%	377	8%	5 001
Ecuador	AMR	Sep 06	1 190	70%	510	30%	...		...		1 700 ⁱ
Egypt	EMR	...	...		...		...		...
El Salvador	AMR	Sep 06	1 602	54%	1 364	46%	2 966	93%	240	7%	3 206
Equatorial Guinea	AFR	...	...		...		...		...
Eritrea	AFR	Dec 05	...		...		...		54 ^e	...	
Estonia	EUR	Jan 06 ^g	173	71%	69	29%	242	95%	13	5%	255
Ethiopia	AFR	Sep 06	18 836	49%	19 604	51%	38 440	96%	1 560	4%	40 000
Fiji	WPR	...	...		...		...		...

Estimated number of adults needing antiretroviral therapy, 2006 ^c			Estimated number of children needing antiretroviral therapy, 2006 ^c			Estimated antiretroviral therapy coverage among adults based on latest report, 2006 ^d			Estimated antiretroviral therapy coverage among children based on latest report, 2006 ^d		
Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate
<100		<200	<100		<200	...			...
...				
2 200	1 200	3 700	<200		<500	...			...
52 000	31 000	75 000	14 000	6 000	24 000	...			3%	2%	7%
...				
40 000	24 000	59 000	2 200	810	4 600	50%	33%	82%	86%	42%	100%
<500		<1000	<100		<200	...			...
580	300	980	<100		<200	...			...
1 600	1 000	2 500	<100		<200	...			...
710	380	1 100	<100		<200	83%	53%	100%	...		
2 400	1 400	3 800	<100		<200	4%	2%	6%	...		
650	350	1 000	<100		<200	54%	34%	99%	...		
17 000	11 000	24 000	3 000	1 200	5 600	...			...
<100		<200	<100		<200	...			...
1 000	570	1 600	<100		<200	...			...
...				
77 000	65 000	87 000	7 100	3 300	13 000	79%	69%	93%	95%	53%	100%
210 000	130 000	310 000	5 000	1 800	10 000	83%	56%	100%	>95%	87%	100%
...				
28 000	20 000	35 000	5 600	2 500	9 200	37%	29%	51%	8%	5%	19%
24 000	12 000	31 000	6 900	2 500	11 000	23%	18%	49%	16%	10%	46%
... ^h	11 000 ^h	32 000 ^h	... ^h	660 ^h	3 300 ^h	...	53%	100%	...	48%	100%
92 000	77 000	110 000	14 000	7 300	21 000	25%	22%	30%	5%	3%	10%
...				
41 000	17 000	64 000	8 000	3 100	15 000	3%	2%	7%	2%	1%	5%
29 000	14 000	51 000	6 900	2 600	14 000	...			<1%		1%
8 700	5 600	13 000	<200		<500	...			...
110 000	67 000	160 000	3 100	1 100	6 300	27%	18%	45%	17%	8%	47%
35 000	23 000	52 000	1 300	460	3 000	...			...
<100		<200	<100		<200	...			...
18 000	11 000	27 000	4 800	2 000	8 600	...			<1%		1%
...				
1 800	920	3 000	<200		<500	>95%		100%	...		
95 000	58 000	130 000	17 000	7 900	30 000	21%	15%	34%	7%	4%	15%
...				
1 400	740	2 400	<100		<200	>95%		100%	...		
...				
...				
160 000	80 000	250 000	44 000	20 000	81 000	11%	7%	22%	1%	<1%	3%
2 600	760	5 600	<500		<1 000	16%	8%	57%	...		
...				
13 000	9 700	15 000	950	420	1 600	37%	30%	48%	40%	23%	89%
4 500	2 300	7 600	660	140	2 400	38%	22%	74%	...		
870	490	1 400	<100		<200	...			...
7 600	4 900	11 000	890	330	2 100	39%	27%	61%	27%	11%	73%
1 400	1 000	1 800	<500		<1 000	...			...
9 300	4 900	15 000	2 300	840	4 600	...			2%	1%	6%
... ^h	900 ^h	2 900 ^h	... ^h	<100 ^h	<200 ^h	...	8%	27%	...	16%	100%
... ^h	69 000 ^h	230 000 ^h	... ^h	12 000 ^h	61 000 ^h	...	17%	56%	...	3%	13%
<100		<200	<100		<200	...			...

Country	WHO region ^b	Month and year of report	Reported number of adult males and females receiving antiretroviral therapy				Reported number of adults and children receiving antiretroviral therapy				
			Males (15+)	% of total	Females (15+)	% of total	Adults (15+)	% of total	Children (<15)	% of total	Total
Gabon	AFR	Dec 05	...		...		...		268 ^e	...	
Gambia	AFR	Dec 05	...		...		...		2 ^e	...	
Georgia	EUR	Oct 06	148	72%	58	28%	206	96%	8	4%	214
Ghana	AFR	Jun 06 ^{fg}	2 781	60%	1 854	40%	4 635	95%	246	5%	4 881
Guatemala	AMR	Dec 06	...		...		5 218	87%	812	13%	6 030
Guinea	AFR	Dec 05	...		...		...		50 ^e	...	
Guinea-Bissau	AFR	...	...		...		...		...
Guyana	AMR	Sep 06	656	46%	774	54%	1 430	91%	137	9%	1 567
Haiti	AMR	Sep 06	3 237	43%	4 360	57%	7 597	95%	439	5%	8 036
Honduras	AMR	Sep 06	1 810	47%	2 046	53%	3 856	87%	588	13%	4 444
Hungary	EUR	Jan 06	350	88%	47	12%	397	99%	5	1%	402
India	SEAR	Nov 06	35 097	67%	17 286	33%	52 383	94%	3 090	6%	55 473
Indonesia	SEAR	Dec 05	...		...		...		1 ^e	...	
Iran, Islamic Republic of	EMR	Dec 05	...		...		...		20 ^e	...	
Iraq	EMR	...	...		...		...		...
Jamaica	AMR	Oct 06	...		...		2 122	90%	223	10%	2 345
Jordan	EMR	Sep 06	35	83%	7	17%	42	93%	3	7%	45
Kazakhstan	EUR	Dec 05	...		...		...		52 ^e	...	
Kenya	AFR	Sep 06 ^g	27 901	35%	52 902	65%	80 803	92%	7 042	8%	87 845
Kiribati	WPR	...	...		...		...		...
Kyrgyzstan	EUR	Nov 06	37	93%	3	7%	40	93%	3	7%	43
Lao People's Democratic Republic	WPR	Dec 05	...		...		...		3 ^e	...	
Latvia	EUR	Jan 06	158	70%	68	30%	225	96%	10	4%	235
Lebanon	EMR	...	...		...		...		...
Lesotho	AFR	Aug 06	...		...		13 722	94%	857	6%	14 579
Liberia	AFR	Dec 05	...		...		...		0 ^e	...	
Libyan Arab Jamahiriya	EMR	...	...		...		...		...
Lithuania	EUR	Jan 06 ^g	45	82%	10	18%	55	100%	0	0%	55
Madagascar	AFR	Dec 05	...		...		...		1 ^e	...	
Malawi	AFR	Jun 06 ^g	20 650	38%	33 204	62%	53 853	94%	3 513	6%	57 366
Malaysia	WPR	...	...		...		...		...
Maldives	SEAR	...	...		...		...		...
Mali	AFR	Dec 05	...		...		...		0 ^e	...	
Marshall Islands	WPR	...	...		...		...		...
Mauritania	AFR	Dec 05	...		...		...		6 ^e	...	
Mauritius	AFR	...	...		...		...		...
Mexico	AMR	...	...		...		...		...
Micronesia, Federated States of	WPR	...	...		...		...		...
Mongolia	WPR	...	...		...		...		...
Montenegro	EUR	Jan 06	14	82%	3	18%	17	94%	1	6%	18
Morocco	EMR	...	...		...		...		...
Mozambique	AFR	Sep 06	12 716	41%	18 360	59%	31 076	91%	2 924	9%	34 000
Myanmar	SEAR	Dec 05	...		...		...		136 ^e	...	
Namibia	AFR	Sep 06	7 372	32%	15 454	68%	22 826	87%	3 502	13%	26 328
Nauru	WPR	...	...		...		...		...
Nepal	SEAR	...	...		...		...		...
Nicaragua	AMR	Sep 06	198	76%	62	24%	260	90%	29	10%	289
Niger	AFR	Dec 05	...		...		...		22 ^e	...	
Nigeria	AFR	Sep 06 ^f	17 692	38%	29 118	62%	46 810	93%	3 280	7%	50 090
Niue	WPR	...	...		...		...		...

Estimated number of adults needing antiretroviral therapy, 2006 ^c			Estimated number of children needing antiretroviral therapy, 2006 ^c			Estimated antiretroviral therapy coverage among adults based on latest report, 2006 ^d			Estimated antiretroviral therapy coverage among children based on latest report, 2006 ^d		
Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate
11 000	6 700	16 000	1 400	660	2 400	...			19%	11%	41%
3 000	1 600	4 800	550	220	1 100	...			<1%		1%
690	360	1 200	<100		<200	21%	18%	57%	...		
55 000	42 000	66 000	8 300	4 000	13 000	9%	7%	11%	3%	2%	6%
9 900	6 000	15 000	1 600	580	3 300	56%	35%	86%	51%	25%	100%
14 000	10 000	19 000	2 600	1 300	3 900	...			2%	1%	4%
5 000	2 700	7 800	1 300	530	2 600	...			...
2 300	920	4 600	<200		<500	61%	31%	100%	...		
19 000	11 000	28 000	2 800	1 200	5 100	39%	27%	67%	16%	9%	35%
9 600	5 200	15 000	1 700	690	3 400	40%	26%	74%	34%	17%	85%
...				
...	610 000 ^h	1 500 000 ^h	...	17 000 ^h	94 000 ^h	...	4%	9%	...	3%	19%
24 000	15 000	36 000	870	310	1 800	...			<1%		1%
8 100	4 600	13 000	<500		<1 000	...			...
...				
4 400	2 400	6 800	<200		<500	49%	31%	90%	...		
<200		<500	<100		<200	...			...
3 500	1 800	5 900	<500		<1 000	...			...
240 000	200 000	280 000	44 000	20 000	77 000	33%	29%	41%	16%	9%	36%
...				
<500		<1 000	<100		<200	...			...
<500		<1 000	<100		<200	...			...
...	940 ^h	2 300 ^h	...	<100 ^h	<200 ^h	...	10%	24%	...		
<500		<1 000	<100		<200	...			...
51 000	46 000	55 000	6 000	3 000	9 900	27%	25%	30%	14%	9%	28%
...				
...				
...	<200 ^h	<1 000 ^h	...	<100 ^h	<200 ^h	...			...
7 400	2 700	15 000	770	230	2 000	...			<1%		1%
160 000	84 000	250 000	23 000	8 300	41 000	33%	22%	64%	15%	9%	42%
12 000	6 200	20 000	520	110	1 900	...			...
...				
22 000	15 000	28 000	5 500	2 600	8 600	...			...
...				
2 000	1 300	2 900	<500		<1 000	...			...
<200		<500	<100		<200	...			...
44 000	25 000	69 000	2 500	730	7 200	...			...
...				
<100		<200	<100		<200	...			...
...				
3 300	2 100	4 900	<200		<500	...			...
250 000	190 000	310 000	34 000	17 000	53 000	12%	10%	16%	9%	6%	17%
74 000	40 000	120 000	2 500	990	4 900	...			5%	3%	14%
40 000	19 000	63 000	4 900	1 800	9 400	57%	36%	100%	71%	37%	95%
...				
12 000	6 900	19 000	680	200	1 900	...			...
880	500	1 400	<100		<200	30%	19%	52%	...		
13 000	6 200	20 000	3 600	1 400	7 100	...			1%	<1%	2%
460 000	270 000	650 000	98 000	44 000	170 000	10%	7%	17%	3%	2%	8%
...				

Country	WHO region ^b	Month and year of report	Reported number of adult males and females receiving antiretroviral therapy				Reported number of adults and children receiving antiretroviral therapy				
			Males (15+)	% of total	Females (15+)	% of total	Adults (15+)	% of total	Children (<15)	% of total	Total
Oman	EMR	Jan 06	...		...		200	89%	25	11%	225
Pakistan	EMR	...	...		...		...		...
Palau	WPR	...	...		...		...		...
Panama	AMR	Sep 06	...		...		2 726	94%	167	6%	2 893
Papua New Guinea	WPR	Aug 06 ^f	183	49%	188	51%	371	100%	1	0%	372
Paraguay	AMR	Sep 06	472	55%	386	45%	858	84%	160	16%	1 018
Peru	AMR	Sep 06 ^g	...		...		7 822	97%	242	3%	8 064
Philippines	WPR	...	...		...		...		...
Poland	EUR	...	...		...		...		...
Republic of Moldova	EUR	Oct 06 ^f	164	54%	142	46%	306	96%	13	4%	319
Romania	EUR	Jan 06 ^g	3 055	51%	2 944	49%	5 999	94%	401	6%	6 400
Russian Federation	EUR	Jan 06 ^{fg}	...		...		4 520	93%	330	7%	4 850
Rwanda	AFR	Sep 06	9 367	34%	18 183	66%	27 550	92%	2 396	8%	29 946
Saint Kitts and Nevis	AMR	...	...		...		...		...
Saint Lucia	AMR	...	...		...		...		...
Saint Vincent and the Grenadines	AMR	...	...		...		...		...
Samoa	WPR	...	...		...		...		...
Sao Tome and Principe	AFR	Dec 05	...		...		...		2 ^e	...	
Saudi Arabia	EMR	...	...		...		...		...
Senegal	AFR	Dec 05	...		...		...		126 ^e	...	
Serbia	EUR	Jan 06 ^g	340	64%	190	36%	530	96%	20	4%	550
Seychelles	AFR	...	...		...		...		...
Sierra Leone	AFR	Dec 05	...		...		...		23 ^e	...	
Slovakia	EUR	Jan 06 ^f	41	85%	7	15%	48	100%	0	0%	48
Solomon Islands	WPR	...	...		...		...		...
Somalia	EMR	Oct 06	20	41%	29	59%	49	98%	1	2%	50
South Africa	AFR	Sep 06	49 030	30%	114 403	70%	163 433	90%	18 318	10%	181 750
Sri Lanka	SEAR	...	...		...		...		...
Sudan	EMR	Dec 05	...		...		...		0 ^e	...	
Suriname	AMR	Sep 06	...		...		562	90%	60	10%	622
Swaziland	AFR	Oct 06	6 607	42%	9 124	58%	15 731	92%	1 429	8%	17 160
Syrian Arab Republic	EMR	...	...		...		...		...
Tajikistan	EUR	...	...		...		...		...
Thailand	SEAR	Nov 06 ^g	...		...		73 363	92%	6 637	8%	80 000
The former Yugoslav Republic of Macedonia	EUR	Oct 06	7	64%	4	36%	11	100%	0	0%	11
Timor-Leste	SEAR	Dec 06	0		0		0		0		0
Togo	AFR	Dec 05	...		...		...		101 ^e	...	
Tonga	WPR	...	...		...		...		...
Trinidad and Tobago	AMR	...	...		...		...		...
Tunisia	EMR	Jan 06	28	67%	14	33%	42	86%	7	14%	49
Turkey	EUR	...	...		...		...		...
Turkmenistan	EUR	...	...		...		...		...
Tuvalu	WPR	...	...		...		...		...
Uganda	AFR	Sep 06 ^f	15 369	33%	30 577	67%	45 946	89%	5 800	11%	51 746
Ukraine	EUR	Sep 06 ^g	1 889	55%	1 531	45%	3 419	86%	547	14%	3 966

Estimated number of adults needing antiretroviral therapy, 2006 ^c			Estimated number of children needing antiretroviral therapy, 2006 ^c			Estimated antiretroviral therapy coverage among adults based on latest report, 2006 ^d			Estimated antiretroviral therapy coverage among children based on latest report, 2006 ^d		
Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate
...				
11 000	6 300	18 000	670	190	1 900	...			...
...				
3 600	2 300	5 200	610	230	1 500	76%	52%	100%	27%	12%	74%
8 500	4 800	14 000	1 300	380	3 800	4%	3%	8%	<1%		1%
1 700	860	2 800	<200		<500	52%	31%	99%	...		
18 000	11 000	26 000	740	270	1 500	44%	30%	73%	33%	16%	90%
1 800	1 100	2 600	<200		<500	...			...
...				
... ^h	2 400 ^h	6 700 ^h	... ^h	<200 ^h	<500 ^h	...	5%	13%	...		
...				
140 000	86 000	210 000	2 000	740	4 200	3%	2%	5%	16%	8%	45%
41 000	27 000	47 000	6 900	3 300	11 000	68%	59%	100%	35%	21%	73%
...				
...				
...				
...				
...				
...				
11 000	5 500	17 000	1 800	620	3 500	...			7%	4%	20%
...				
...				
7 400	4 400	11 000	2 000	860	3 600	...			1%	<1%	3%
...				
...				
7 100	3 500	13 000	1 700	720	3 600	1%	<1%	1%	<1%		1%
910 000	780 000	1 000 000	86 000	43 000	130 000	18%	16%	21%	21%	14%	42%
690	420	1 000	<100		<200	...			...
56 000	30 000	94 000	9 900	3 900	19 000	...			0%		
730	400	1 200	<100		<200	77%	49%	100%	...		
39 000	25 000	52 000	5 300	2 600	9 300	40%	30%	62%	27%	15%	54%
...				
<500		<1 000	<100		<200	...			...
120 000	66 000	190 000	4 100	1 600	7 900	60%	38%	100%	>95%	84%	100%
...				
...				
19 000	11 000	28 000	3 800	1 700	6 800	...			3%	2%	6%
...				
5 400	3 000	8 500	<500		<1 000	...			...
...				
...				
<100		<200	<100		<200	...			...
...				
190 000	120 000	230 000	42 000	17 000	66 000	24%	20%	38%	14%	9%	35%
... ^j			... ^j			...			...

Country	WHO region ^b	Month and year of report	Reported number of adult males and females receiving antiretroviral therapy				Reported number of adults and children receiving antiretroviral therapy				
			Males (15+)	% of total	Females (15+)	% of total	Adults (15+)	% of total	Children (<15)	% of total	Total
United Republic of Tanzania	AFR	Oct 06	15 091	36%	26 829	64%	41 920	91%	4 204	9%	46 124
Uruguay	AMR	Sep 06	...		...		1 355	95%	70	5%	1 425
Uzbekistan	EUR	...	...		...		...		...
Vanuatu	WPR	Oct 06	...		...		2	100%	0	0%	2
Venezuela, Bolivarian Republic of	AMR	May 05 ^g	8 239	75%	2 711	25%	10 950	96%	489	4%	11 439
Viet Nam	WPR	Sep 06 ^f	2 516	79%	680	21%	3 196	91%	336	10%	3 532
Yemen	EMR	Sep 06	0		0		0		0		0
Zambia	AFR	Sep 06	25 726	39%	39 657	61%	65 383	91%	6 146	9%	71 529
Zimbabwe	AFR	Jun 06 ^g	10 560	40%	15 767	60%	26 327	91%	2 610	9%	28 937

... Data not available or applicable.

- ^a All countries except those in Western Europe and Australia, Bahamas, Bahrain, Brunei, Canada, Cyprus, Grenada, Israel, Japan, Kuwait, New Zealand, Qatar, Republic of Korea, Singapore, United Arab Emirates, and United States of America.
- ^b This table includes 154 WHO Member States (AFR: WHO African Region ($n = 46$); AMR: WHO Region of the Americas ($n = 31$); EMR: WHO Eastern Mediterranean Region ($n = 17$); EUR: WHO European Region ($n = 28$); SEAR: WHO South-East Asia Region ($n = 11$); WPR: WHO Western Pacific Region ($n = 21$)).
- ^c The needs estimates are based on the methods described at the end of this Annex. The estimates for individual countries may differ according to the local methods used.
- ^d The coverage estimate is based on the reported number of people receiving antiretroviral therapy and the estimated unrounded need for antiretroviral therapy. Ranges in coverage estimates are based on plausibility bounds in the denominator, i.e. low and high need estimates. No coverage has been calculated where the need is estimated to be less than 500.
- ^e The most recent data available are from the document: UNAIDS/UNICEF/WHO. *Children and AIDS: A stocktaking report*. New York, 2007.
- ^f Latest available breakdowns refer to partial data sets and do not reflect national-level data. See Annex 1 for national-level data.
- ^g Latest available breakdowns are not as recent as the latest reported national level data. See Annex 1 for the latest reported national level data.
- ^h The estimated number of people needing ARV therapy is currently under review and will be adjusted, as appropriate, based on new data collected during 2006. Preliminary analysis suggests that the number of people needing ARV therapy lies within these ranges. UNAIDS and WHO will post new estimates on their websites as they become available.
- ⁱ Numbers for children were not reported separately and are assumed to have been included in the adult numbers.
- ^j The estimated number of people needing ARV therapy is currently under review and will be adjusted, as appropriate, based on new data collected during 2006.

Estimated number of adults needing antiretroviral therapy, 2006 ^c			Estimated number of children needing antiretroviral therapy, 2006 ^c			Estimated antiretroviral therapy coverage among adults based on latest report, 2006 ^d			Estimated antiretroviral therapy coverage among children based on latest report, 2006 ^d		
Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate	Estimate	Low estimate	High estimate
240 000	200 000	280 000	41 000	21 000	65 000	18%	15%	21%	10%	6%	20%
2 800	1 500	4 800	<100		<200	48%	28%	92%	...		
... ^h	1 800 ^h	5 800 ^h	... ^h	<200 ^h	<500 ^h	...			...
...				
23 000	12 000	38 000	700	150	2 500	48%	29%	93%	70%	19%	100%
40 000	24 000	60 000	2 100	770	4 300	8%	5%	13%	16%	8%	44%
...				
190 000	160 000	210 000	41 000	21 000	63 000	34%	31%	41%	15%	10%	29%
310 000	200 000	410 000	45 000	18 000	85 000	9%	6%	13%	6%	3%	14%

EXPLANATORY NOTES TO ANNEXES 1 AND 2

The methods for estimating the number of people receiving treatment, treatment need and coverage have been described elsewhere.¹ The current report uses similar methods, except that WHO has now solicited updates for all countries. Annex 1 focuses on country-specific ART scale-up at the national level for all age groups. In addition, Annex 2 presents, for the first time, data on access to antiretroviral therapy disaggregated by sex and age (adults constituting age group 15+ years; children constituting age group <15 years).

Estimating the number of people of all ages receiving antiretroviral therapy

The current estimates of the numbers of people receiving antiretroviral therapy are based on the most recent reports received from either the ministries of health or the WHO or UNAIDS offices in the countries concerned, or from other reliable sources in the countries, such as bilateral partners, foundations and nongovernmental agencies that are major providers of treatment services. WHO and UNAIDS work with countries in order to obtain as many facility-specific data as possible on the numbers of people receiving treatment. The estimated numbers involve some uncertainty for countries that have not yet established systems for regular reporting of new people receiving treatment, adherence rates, defaulters, people lost to follow-up, and deaths. A particular source of uncertainty is that, in some cases, country-reported figures do not distinguish between people who have ever started antiretroviral therapy and those who are still receiving it (i.e. continuing to pick up their medicines). The difference between the two numbers reflects discontinuation of treatment, losses to follow-up, and mortality.

Uncertainty may also arise because of the difficulty in measuring the extent of treatment provision in the private sector. Many people are supplied with medicines through local pharmacies and private clinics that do not report through official channels. Private companies may have programmes that support treatment for workers with advanced HIV disease, but in some cases the data relating to these programmes are not reported to the public health authorities.

A third source of uncertainty arises from the time lag between country reporting and global reporting, the former usually having been earlier than the latter, which was in December 2006. Given the current rapid expansion in numbers in many countries, monthly increases must be estimated and projected to December 2006. In this way the end-of-year estimates are based on simple linear projections of reported numbers, recent trends being used to indicate growth.

This report provides data on the estimated numbers of people receiving antiretroviral therapy in December 2006 for 154 low- and middle-income countries. For 16 of these countries, data were available as of December 2006 and therefore no extrapolations were necessary. Eighty-one countries provided updates for September 2006 or later, i.e. projections of 1–3 months were made to December 2006. Together these 97 countries represent 93% of the total estimate of people receiving treatment as of December 2006. Among the remaining countries, 24 provided updates for a month between January and August 2006, and data have been extrapolated² to December 2006. For 18 countries, data were available only for 2005 and projections were made in respect of only four of these countries that updated their 2005 data in 2006. No data are available for 12 countries.

Also presented are the most recently reported data on the number of people receiving antiretroviral therapy in high-income countries. No projections to December 2006 have been made for these countries because not enough recent data points were available on which to base extrapolations.

Because of the uncertainties involved in developing the overall estimates by country, Annex 1 indicates uncertainty ranges around the estimated number of people receiving treatment in December 2006. For data reported on the public sector, 5%–25% uncertainty ranges have been used, depending on the strength of the monitoring system and the comprehensiveness of the reported data.³ The same ranges have been used for countries reporting data on the public and private sectors combined. For private sector data, which were separately reported in some countries, uncertainty ranges from 10%–40% were used. Private sector numbers are provided in the footnotes of Annex 1.

The United States President's Emergency Plan for AIDS Relief and the Global Fund to Fight AIDS, Tuberculosis and Malaria are major funders of antiretroviral therapy programmes in low- and middle-income countries. These two initiatives

1 Boerma TJ, et al. Monitoring the scale-up of antiretroviral therapy programmes: methods to estimate coverage. *Bulletin of the World Health Organization* 2006;84:145-50.

2 Op. cit.

3 Op. cit.

support more than half of the total number of people receiving treatment as reported by countries to WHO. WHO and UNAIDS use the data from the Emergency Plan and the Global Fund to cross-validate the reported country numbers.

Estimating the number of children aged under 15 years receiving antiretroviral therapy

The number of children receiving antiretroviral therapy were reported through the following two processes.

Firstly, data were collected through the Report Card on Prevention of Mother-to-Child Transmission and Paediatric HIV Care, a questionnaire issued jointly by UNICEF and WHO, with input from the members of the expanded Interagency Task Team on PMTCT. The survey was administered through UNICEF country offices and data were collected from ministries of health and national AIDS councils. Data on the number of children receiving ART were received from 69 countries, giving a picture of progress at the end of December 2005. These data have been published in a joint UNICEF/UNAIDS/WHO report.⁴

Secondly, during the second half of 2006, WHO, through its country and regional offices, and in collaboration with UNAIDS and UNICEF, collected data for 2006 from ministries of health and national AIDS councils in order to monitor the progress of the health sector towards universal access. Ninety-six responses were received.

These two data sets were consolidated and the most recent reported numbers for 102 countries are presented in Annex 2.

Monthly growth was calculated for the 46 countries where data for December 2005 and the latest report in any month in 2006 were available. These countries represent 98% of the total reported number of children on treatment in 2006. Projections of the number of children receiving antiretroviral therapy by December 2006 were also made per country on the basis of these two available data points. They are presented for the regional level in Table 2.

Estimating treatment need

UNAIDS and WHO have developed a standard methodology for estimating the size and course of the AIDS epidemic which also generates estimates of the numbers of people living with HIV, people with new HIV infections, and deaths attributable to AIDS.⁵ These methods are used to estimate the number of adults needing treatment, taking into account the maturity of the epidemic. In a young and growing epidemic, a smaller proportion of people living with HIV/AIDS needs to start treatment than in a mature or declining epidemic.

As a growing number of countries are now able to report data on treatment for children aged under 15 years, this report includes data on treatment needs disaggregated for the age groups <15 and 15+, together with comparable data for all age groups. The estimates for the age group 0–15 years were developed in collaboration with UNICEF.

WHO recommends that, in resource-constrained settings, HIV-infected adults and children should start antiretroviral therapy when the infection has been confirmed and there are signs of clinically advanced disease.⁶ The number of people with advanced HIV infection who should start treatment is estimated on the assumption that, without access to antiretroviral treatment, the time from eligibility to death is approximately two years. This parameter is currently under revision and will be changed as new data and analyses become available.

The total number of people needing antiretroviral therapy is calculated by adding the number of people who need to start antiretroviral therapy to the number who were receiving treatment in the previous year and survived into the current year. At present it is assumed that approximately 90% of the people receiving treatment will survive to the following year, depending on when treatment is initiated, adherence, drug resistance patterns, the quality of clinical management and other factors.

Antiretroviral therapy coverage

In Annex 1, the level of coverage is calculated by dividing the estimated number of people receiving antiretroviral therapy as of December 2006 by the number of people estimated to need treatment in 2006. In Annex 2, the numerator for calculating level of coverage is the latest reported data on the number of people receiving antiretroviral therapy in 2005 or 2006 disaggregated for the age groups <15 and 15+. The denominator is the number of people estimated to need treatment in 2006 disaggregated for the age groups <15 and 15+. Ranges around the levels of coverage are based on the uncertainty ranges around the estimates of need for children and adults.⁷

4 UNICEF, UNAIDS and WHO. *Children and AIDS: a stocktaking report*. UNICEF, UNAIDS and WHO; 2007.

5 UNAIDS. *Report on the global AIDS epidemic*. A UNAIDS tenth anniversary special edition. UNAIDS, 2006. Also: *Sexually Transmitted Infections* 2006;82(Suppl III).

6 WHO. *Antiretroviral therapy for HIV infection in adults and adolescents in resource-limited settings: towards universal access. Recommendations for a public health approach*. WHO; 2006 revision. Also: WHO. *Antiretroviral therapy of HIV infection in infants and children in resource-limited settings: towards universal access. Recommendations for a public health approach*. WHO, 2006.

7 Morgan M, et al. Improved plausibility bounds about the 2005 HIV and AIDS estimates. *Sexually Transmitted Infections* 2006;82(Suppl III):iii71-iii77.

ANNEX 3. PREVENTING MOTHER-TO-CHILD TRANSMISSION OF HIV IN LOW- AND MIDDLE-INCOME COUNTRIES^{a,b}

Country	WHO region ^c	Antenatal care coverage (%), 1997-2005 ^d	Estimated number of live births, 2005 (thousands)	Estimated number of HIV-infected pregnant women, 2005			Reported number of HIV-infected pregnant women who received ARVs for PMTCT, December 2005	Estimated percentage of HIV-infected pregnant women who received ARVs for PMTCT, 2005 ^e		
				Estimate	Low estimate	High estimate		Estimate	Low estimate	High estimate
Afghanistan	EMR	16%	1 441	<100	<100	<100	...	...	...
Albania	EUR	91%	53	...	...	...	...	...	...
Algeria	AFR	81%	684	<500	<200	1 000	...	...	...
Angola	AFR	66%	767	33 000	18 000	52 000	367	1%	<1%	
Antigua and Barbuda	AMR	100%	2	...	...	...	...	...	...
Argentina	AMR	98%	687	2 400	1 200	4 200	2 088	87%	50%	
Armenia	EUR	93%	34	<100	<100	<100	...	...	...
Azerbaijan	EUR	70%	134	<100	<100	<200	...	...	...
Bangladesh	SEAR	49%	3 747	<200	<100	<500	...	...	...
Barbados	AMR	100%	3	<100	<100	<100	...	...	...
Belarus	EUR	100%	91	<200	<100	<500	119 ^f	...	...
Belize	AMR	96%	7	<100	<100	<200	38	...	...
Benin	AFR	81%	348	7 300	4 000	11 000	1 214	17%	11%	
Bhutan	SEAR	51%	64	<100	<100	<100	...	...	...
Bolivia	AMR	79%	265	<500	<100	510	...	...	...
Bosnia and Herzegovina	EUR	99%	36	...	...	...	...	...	...
Botswana	AFR	97%	45	14 000	12 000	16 000	7 543	54%	46%	
Brazil	AMR	97%	3 726	14 000	7 200	25 000	6 771	48%	27%	
Bulgaria	EUR	...	67	...	...	...	...	...	...
Burkina Faso	AFR	73%	617	15 000	9 400	20 000	937	6%	5%	
Burundi	AFR	78%	347	16 000	13 000	18 000	524	3%	<3%	
Cambodia	WPR	38%	429	6 500	3 100	11 000	228	4%	2%	
Cameroon	AFR	83%	563	35 000	32 000	38 000	3 592	10%	9%	
Cape Verde	AFR	99%	15	...	...	...	12	...	...
Central African Republic	AFR	62%	150	19 000	7 500	32 000	803	4%	3%	
Chad	AFR	39%	471	19 000	8 500	33 000	193	1%	<1%	
Chile	AMR	95% ^f	249	<500	<200	770	...	...	...
China	WPR	90%	17 310	7 500	3 900	13 000	135	2%	1%	
Colombia	AMR	94%	968	3 100	1 700	6 700	...	...	...
Comoros	AFR	74%	28	<100	<100	<100	...	...	...

Congo	AFR	177	11 000	6 100	17 000	1 093	10%	7%	18%
Cook Islands	WPR	...	...	...	...	...	...	...	...
Costa Rica	AMR	79	<200	<100	<500	...	...	...	...
Côte d'Ivoire	AFR	665	57 000	32 000	86 000	2 543	4%	3%	8%
Croatia	EUR	41	...	...	...	...	...	...	...
Cuba	AMR	134	<200	<100	<500	...	...	...	...
Czech Republic	EUR	...	...	...	...	...	...	...	...
Democratic People's Republic of Korea	SEAR	342	...	...	...	...	...	...	...
Democratic Republic of the Congo	AFR	2 873	99 000	47 000	160 000	1 725	2%	1%	4%
Djibouti	EMR	27	1 200	<500	2 600	16	1%	<1%	5%
Dominica	AMR	2	...	...	...	...	...	...	...
Dominican Republic	AMR	211	2 500	2 100	2 900	676	27%	23%	32%
Ecuador	AMR	295	1 000	<500	3 400	223	22%	7%	51%
Egypt	EMR	1 909	...	...	...	...	...	...	...
El Salvador	AMR	166	800	<500	1 700	144	18%	8%	34%
Equatorial Guinea	AFR	22	810	660	950	...	...	...	...
Eritrea	AFR	170	5 100	2 500	8 700	88	2%	1%	4%
Estonia	EUR	...	...	...	...	...	...	...	...
Ethiopia	AFR	3 104	...	32 000	120 000	2 341	...	2%	7%
Fiji	WPR	19	<100	...	<100	...	...	...	...
Gabon	AFR	42	3 600	1 900	5 600	90	3%	2%	5%
Gambia	AFR	52	1 400	660	2 600	87	6%	3%	13%
Georgia	EUR	49	<100	...	<200	15	...	...	...
Ghana	AFR	683	19 000	16 000	22 000	1 078	6%	5%	7%
Guatemala	AMR	437	2 100	1 100	3 700	200	10%	5%	19%
Guinea	AFR	387	6 800	5 400	7 900	77	1%	<1%	2%
Guinea-Bissau	AFR	79	3 600	1 700	6 000	...	...	...	...
Guyana	AMR	15	<500	<200	770	112	...	...	...
Haiti	AMR	255	12 000	6 100	18 000	800	7%	5%	13%
Honduras	AMR	206	1 700	800	2 800	198	12%	7%	25%
Hungary	EUR	...	...	...	...	...	...	...	...
India	SEAR	25 926	130 000	68 000	240 000	2 279	2%	1%	3%
Indonesia	SEAR	4 495	2 000	1 000	3 500	4	<1%	...	<1%
Iran (Islamic Republic of)	EMR	1 348	700	<500	1 900	...	...	...	...
Iraq	EMR	978	...	...	...	...	...	...	...

Country	WHO region ^e	Antenatal care coverage (%), 1997-2005 ³	Estimated number of live births, 2005 (thousands)	Estimated number of HIV-infected pregnant women, 2005			Reported number of HIV-infected pregnant women who received ARVs for PMTCT, December 2005	Estimated percentage of HIV-infected pregnant women who received ARVs for PMTCT, 2005 ^e		
				Estimate	Low estimate	High estimate		Estimate	Low estimate	High estimate
Jamaica	AMR	98%	52	<500	730	300	...	...	...
Jordan	EMR	99%	150	<100	<100	...	...	...	...
Kazakhstan	EUR	91%	237	<500	1 200	47	...	...	...
Kenya	AFR	88%	1 361	99 000	110 000	19 403	20%	17%	23%	
Kiribati	WPR	88% ^f	2	...	...	...	...	...	...
Kyrgyzstan	EUR	97%	116	<100	<200	...	...	...	...
Lao People's Democratic Republic	WPR	27%	205	<100	<500	11	...	...	...
Latvia	EUR	...	...	...	...	...	...	...	...
Lebanon	EMR	96%	66	<100	<200	...	...	...	...
Lesotho	AFR	90%	50	15 000	16 000	1 811	12%	11%	13%	
Liberia	AFR	85%	167	...	...	130	...	...	...
Libyan Arab Jamahiriya	EMR	81% ^f	136	...	...	...	...	...	...
Lithuania	EUR	...	...	...	...	...	...	...	...
Madagascar	AFR	80%	712	2 000	5 000	8	<1%	...	1%	
Malawi	AFR	92%	555	89 000	140 000	5 076	6%	4%	13%	
Malaysia	WPR	74%	547	1 400	4 500	141	10%	3%	24%	
Maldives	SEAR	81%	10	...	...	...	...	...	...
Mali	AFR	57%	661	13 000	16 000	415	3%	2%	4%	
Marshall Islands	WPR	...	2	...	...	...	...	...	...
Mauritania	AFR	64%	126	1 000	2 200	10	1%	<1%	2%	
Mauritius	AFR	...	20	<100	<200	...	...	...	...
Mexico	AMR	86% ^f	2 172	2 400	6 100	...	...	...	...
Micronesia, Federated States of	WPR	...	3	...	...	...	...	...	...
Mongolia	WPR	94%	58	<100	<100	...	...	...	...
Montenegro ^g	EUR	...	10 800	...	...	6	...	...	...
Morocco	EMR	68%	717	<500	680	...	...	...	...
Mozambique	AFR	85%	773	150 000	200 000	8 490	6%	4%	9%	
Myanmar	SEAR	76%	976	7 700	13 000	629	8%	5%	17%	
Namibia	AFR	91%	56	14 000	24 000	4 055	29%	17%	69%	
Nauru	WPR	...	...	...	...	...	...	...	...

Nepal	SEAR	28%	787	1 700	780	4 200	...	...	...
Nicaragua	AMR	86%	154	<200	<100	<500	29	...	...
Niger	AFR	41%	750	9 200	3 700	17 000	57	1%	<1%	2%	
Nigeria	AFR	58%	5 377	250 000	130 000	380 000	532	<1%	...	1%	
Niue	WPR	...	...	...	...	...	...	...	...	...
Oman	EMR	100%	64	...	...	...	...	...	...	...
Pakistan	EMR	36%	4 773	1 700	800	4 300	...	...	...	...
Palau	WPR	...	...	...	...	...	...	...	...	...
Panama	AMR	72%	70	<500	<200	670	...	...	...	...
Papua New Guinea	WPR	78% ¹	174	3 700	1 700	9 200	46	1%	<1%	3%	
Paraguay	AMR	94%	177	<500	<200	1 200	47	...	...	...
Peru	AMR	92%	628	2 100	1 100	3 600	188	9%	5%	18%	
Philippines	WPR	88%	2 018	<500	<200	550	...	...	...	...
Poland	EUR	...	...	...	...	...	...	...	...	...
Republic of Moldova	EUR	98%	43	520	<500	1 300	32	6%	...	13%	
Romania	EUR	94%	211	<100	<100	<100	21	...	...	...
Russian Federation	EUR	...	1 540	6 800	3 500	12 000	5 709	84%	48%	100%	
Rwanda	AFR	94%	375	16 000	15 000	17 000	5 782	36%	34%	38%	
Saint Kitts and Nevis	AMR	100%	1	...	...	...	...	...	...	...
Saint Lucia	AMR	48%	3	...	...	...	...	...	...	...
Saint Vincent and the Grenadines	AMR	99%	2	...	...	...	...	...	...	...
Samoa	WPR	...	5	...	...	...	...	...	...	...
Sao Tome and Principe	AFR	91%	5	...	...	...	8	...	...	...
Saudi Arabia	EMR	90% ¹	671	...	...	...	...	...	...	...
Senegal	AFR	79%	423	4 600	1 900	8 100	57	1%	<1%	3%	
Serbia ^a	EUR	...	...	...	...	...	6	...	...	...
Seychelles	AFR	...	3	...	...	...	...	...	...	...
Sierra Leone	AFR	68%	252	4 800	2 700	7 300	57	1%	<1%	2%	
Slovakia	EUR	...	...	...	...	...	...	...	...	...
Solomon Islands	WPR	...	15	...	...	...	...	...	...	...
Somalia	EMR	32%	366	4 400	2 100	8 400	...	...	...	...
South Africa	AFR	92%	1 082	250 000	230 000	280 000	75 077	30%	27%	33%	
Sri Lanka	SEAR	100%	329	<100	<100	<100	...	...	...	...
Sudan	EMR	60%	1 166	23 000	10 000	42 000	41	<1%	...	1%	
Suriname	AMR	91%	9	<100	<100	<200	33 ¹	...	...	...

Country	WHO region ^e	Antenatal care coverage (%), 1997-2005 ³	Estimated number of live births, 2005 (thousands)	Estimated number of HIV-infected pregnant women, 2005			Reported number of HIV-infected pregnant women who received ARVs for PMTCT, December 2005	Estimated percentage of HIV-infected pregnant women who received ARVs for PMTCT, 2005 ^e		
				Estimate	Low estimate	High estimate		Estimate	Low estimate	High estimate
Swaziland	AFR	90%	29	14 000	7 800	20 000	4 780	34%	24%	62%
Syrian Arab Republic	EMR	71%	532	...	...	...	...	...	...	...
Tajikistan	EUR	71%	185	<100	...	<200	4	12%	4%	29%
Thailand	SEAR	92%	1 009	...	5 600 ^h	6 400 ^h	5 358 ⁱ	...	83% ^h	95% ^h
The former Yugoslav Republic of Macedonia	EUR	81%	23	...	...	...	...	...	...	...
Timor-Leste	SEAR	61%	49	...	...	...	...	...	...	...
Togo	AFR	85%	236	9 200	4 600	14 000	720	8%	5%	16%
Tonga	WPR	...	2	...	...	...	...	...	...	...
Trinidad and Tobago	AMR	92%	19	640	<500	1 100	...	...	...	...
Tunisia	EMR	92%	166	<200	<100	<500	...	...	...	...
Turkey	EUR	81%	1 500	...	...	...	...	...	...	...
Turkmenistan	EUR	98%	108	<100	...	<100	...	...	...	...
Tuvalu	WPR	...	...	...	...	...	...	...	...	...
Uganda	AFR	92%	1 468	110 000	97 000	130 000	12 073	11%	10%	12%
Ukraine	EUR	...	392	2 400	1 300	4 300	2 168	90%	50%	100%
United Republic of Tanzania	AFR	78%	1 408	110 000	98 000	120 000	6 202	6%	5%	7%
Uruguay	AMR	94%	57	<500	<200	950	...	...	...	...
Uzbekistan	EUR	97%	615	<500	<200	1 000	...	...	...	...
Vanuatu	WPR	...	6	...	...	...	...	...	...	...
Venezuela, Bolivarian Republic of	AMR	94%	593	2 300	970	7 600	...	...	...	...
Viet Nam	WPR	86%	1 648	5 500	2 800	9 800	368	7%	4%	13%
Yemen	EMR	41%	845	...	...	...	...	...	...	...
Zambia	AFR	93%	472	97 000	90 000	100 000	14 071	15%	14%	16%
Zimbabwe	AFR	93%	384	98 000	57 000	140 000	8 461	9%	6%	15%

... Data not available or not applicable.

- ^a All countries except those in Western Europe and Australia, Bahamas, Bahrain, Brunei, Canada, Cyprus, Grenada, Israel, Japan, Kuwait, New Zealand, Qatar, Republic of Korea, Singapore, United Arab Emirates, and United States of America.
- ^b See notes to this annex for definitions of the indicators and for an explanation of the methods used.
- ^c This table includes 154 WHO Member States (AFR: WHO African Region ($n = 46$); AMR: WHO Region of the Americas ($n = 31$); EMR: WHO Eastern Mediterranean Region ($n = 17$); EUR: WHO European Region ($n = 28$); SEAR: WHO South-East Asia Region ($n = 11$)); WPR: WHO Western Pacific Region ($n = 21$).
- ^d Data refer to the most recent year available during the period specified in the column heading.
- ^e The coverage estimate is calculated by dividing the number of HIV-infected pregnant women who received ARVs for PMTCT by the estimated unrounded number of HIV-infected pregnant women. Ranges in coverage estimates are based on plausibility bounds in the denominator, i.e. low and high estimated number of HIV-infected pregnant women. No coverage has been calculated where the number of HIV-infected pregnant women is estimated to be less than 500.
- ^f Data refer to years or periods other than those specified in the column heading, differ from the standard definition or refer to only part of a country.
- ^g Because of secession in June 2006 of Montenegro from the State Union of Serbia and Montenegro, and its subsequent admission to the UN on 28 June 2006, disaggregated data for Montenegro and Serbia as separate states are not yet available. The aggregated data presented are for Serbia and Montenegro before secession took place.
- ^h Thailand has very high ANC coverage and almost universal HIV testing of ANC attendees. The denominator used in these calculations is based on the reported number of HIV-infected women in the public clinics.
- ⁱ Reported by the Perinatal HIV Intervention Monitoring System (PHIMS), Bureau of Health Promotion, Department of Health, Thailand (update for 2005 as of August 2006).

EXPLANATORY NOTES TO ANNEX 3

The programme coverage data presented in Annex 3 were collected through the Report Card on Prevention of Mother-to-Child Transmission and Paediatric HIV Care, a questionnaire issued jointly by UNICEF and WHO, with input from the members of the expanded Interagency Task Team on PMTCT. The national-level programme indicators in the Report Card have been developed through collaborative processes with key international partners in PMTCT. For the year 2006, when the Report Card was administered through UNICEF country offices, it attempted to capture the 2005 country situation for PMTCT. Many of the data have been published.⁸ Annex 3 presents a small subset of the indicators and updated country data.

Unless otherwise noted the estimated numbers of HIV-infected pregnant women are based on country estimation models used to produce HIV prevalence estimates by the UNAIDS/WHO Working Group on Global HIV/AIDS and STI Surveillance.

Consistent with ART estimates in this report, uncertainty ranges around the estimated population in need (denominator) are presented, and, accordingly, the coverage of HIV-infected pregnant women receiving ARVs for PMTCT is also reported with ranges.

Indicators

Antenatal care coverage

Percentage of women (aged 15–49 years) attended at least once during pregnancy by skilled health personnel.
Source: UNICEF. *The State of the world's children, 2007*.

Estimated number of live births

Source: UNICEF. *The State of the world's children, 2007*.

Estimated number of HIV-infected pregnant women

Estimated number of HIV-infected pregnant women (aged 15–49 years) living with HIV as of 2005.
Source: WHO/UNAIDS Working Group on Global HIV/AIDS and STI Surveillance.

Reported number of HIV-infected pregnant women who received ARVs for PMTCT

Number of women testing HIV-positive during visits to antenatal clinics who were provided with ARVs for the prevention of mother-to-child transmission.
Source: UNICEF/UNAIDS/WHO. *Children and AIDS: a stocktaking report, 2007*.

8 UNICEF/UNAIDS/WHO. *Children and AIDS: a stocktaking report, 2007*.

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