World Health Organization

HIV REPORTING

GLOBAL UPDATE
ON THE HEALTH SECTOR RESPONSE TO HIV, 2014

JULY 2014

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CONTENTS

ACRONYMS AND ABBREVIATIONS

3TC	lamivudine
AIDS	acquired immune deficiency syndrome
AIS	AIDS Indicator Survey
ART	antiretroviral therapy
ARV	antiretroviral
AZT	zidovudine
d4T	stavudine
DHS	Demographic and Health Survey
EFV	efavirenz
FTC	emtricitabine
HBV	hepatitis B virus
HCV	hepatitis C virus
HIV	human immunodeficiency virus
LPV/r	lopinavir/ritonavir
NNRTI	non-nucleoside reverse-transcriptase inhibitor
NVP	nevirapine
PMTCT	prevention of the mother-to-child transmission of HIV
TB	tuberculosis
TDF	tenofovir disproxil fumarate
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
WHO	World Health Organization

EXECUTIVE SUMMARY

The massive expansion globally of HIV interventions has transformed both the HIV epidemic and the broader public health landscape, demonstrating that the right to health can be realized even in the most trying of circumstances.

Substantial – and in some respects, remarkable – progress has been made in the past 3–4 years, especially in areas in which clear service delivery targets have been set, such as HIV treatment, preventing the mother-to-child transmission of HIV and preventing and treating tuberculosis (TB) and HIV coinfection. Nevertheless, this report also highlights the current unevenness of the HIV response – across different countries, communities, populations and interventions – and the considerable opportunities that exist for extending and sustaining recent improvements with a view towards ending the AIDS epidemic by 2030. Lessons learned from HIV can also inform the broader effort to achieve universal health coverage, a key element of the post-2015 development agenda, affording to all people access to high-quality health services they need without subjecting them to financial hardship.

A review of recent progress

This review[1] is cast within the framework of the Global Health Sector Strategy on HIV/AIDS 2011–2015 (see box). Endorsed at the 2011 World Health Assembly, the Strategy was developed to guide the expansion of the global HIV response beyond the HIV-specific programmes of the past, by strategically positioning HIV within a rapidly changing health and development agenda.

While building on core HIV programmes, the Strategy is aimed at maximizing links and synergy with other vital public health areas in ways that improve health outcomes overall and strengthen health and community systems for sustainable action. It is also intended to influence other sectors to adopt policies that reflect public health priorities and that foster enabling environments, and to address the underlying social and structural determinants of HIV epidemics.

Global Health Sector Strategy on HIV/AIDS: four targets for 2015

The goals of the Strategy are zero new HIV infections, zero AIDS-related deaths and zero discrimination in a world in which people living with HIV are able to live long, healthy lives. Reaching these goals requires drastically expanding the coverage and improvement in the quality of HIV prevention, diagnosis, treatment and care interventions. Designed to help achieve those outcomes, the Strategy is structured along four strategic directions:

Strategic direction 1: Optimize HIV prevention, diagnosis, treatment and care outcomes;

Strategic direction 2: Leverage broader health outcomes through HIV responses;

Strategic direction 3: Build strong and sustainable systems; and

Strategic direction 4: Reduce vulnerability and remove structural barriers to accessing services.

HIV prevention gains need to be extended and focused better

The coverage and quality of prevention services have generally improved, and an expanding array of highly effective HIV interventions is available. In addition to the promotion of behavioural changes, several biomedical interventions are being deployed. They include initiating ART regardless of CD4 cell count for serodiscordant couples, pregnant and breastfeeding women, and in some settings key populations, as well as voluntary medical male circumcision (in settings with a high prevalence of HIV infection in eastern and southern Africa) and the use of ARV drugs for both pre-exposure prophylaxis and post-exposure prophylaxis of HIV.

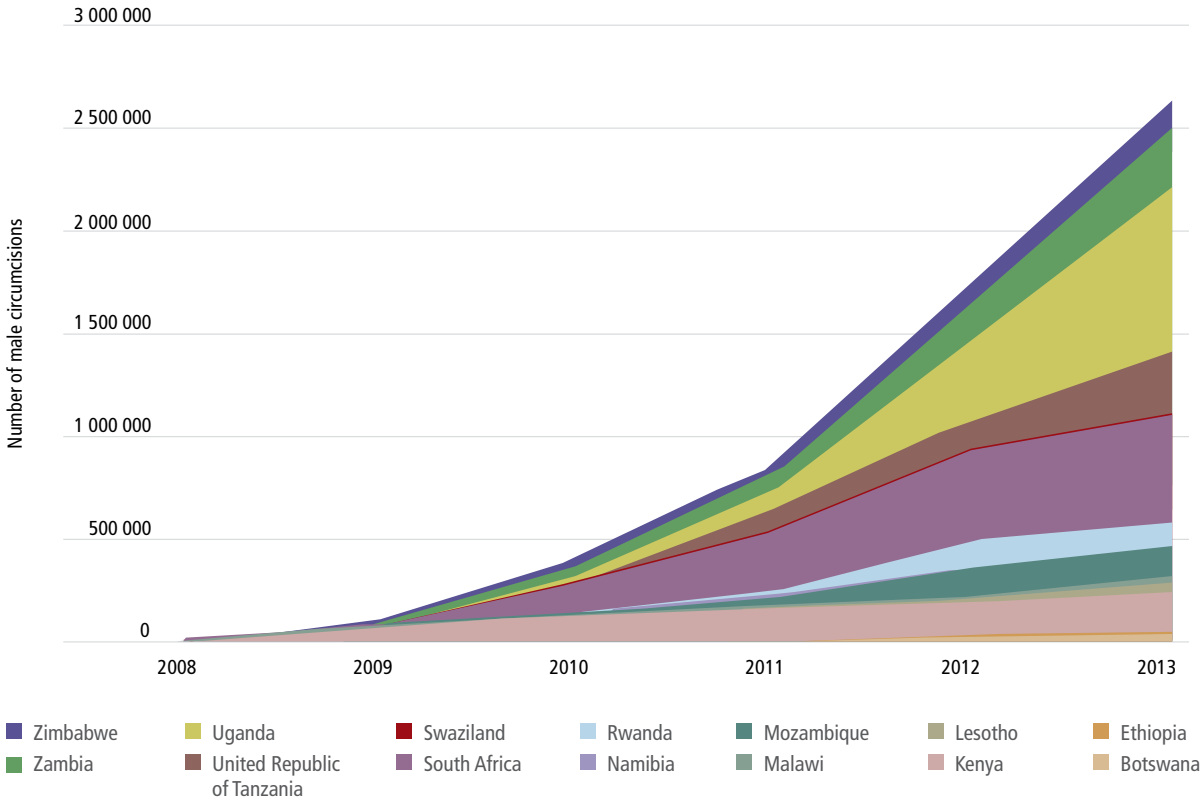
[1] The full report is available at www.who.int/hiv.

Together, these interventions have been contributing to significant reductions in the numbers of adults and children acquiring HIV infection, from 2.5 million [2.3 – 2.7 million] in 2009 to 2.1 million [1.9 – 2.4 million] in 2013. A priority now is to tailor these approaches and focus efforts more effectively on settings and populations in which HIV transmission is occurring.

In particular, HIV strategies need to draw adolescents and young people (especially girls and young women) into sharper focus, and the neglect of HIV services for key populations (including men who have sex with men, sex workers, transgender people and people who inject drugs) in many countries has to end. Young people (15–24 years old) accounted for about one third of the people estimated to be newly infected with HIV globally. Key populations, meanwhile, account for most of the people newly infected with HIV outside the WHO African Region and a significant share of the people acquiring HIV infection in urban settings in Africa. The coverage and uptake of HIV and other essential health services for these populations need to improve substantially.

Although the full benefits of condom promotion have not yet been realized (in low- and middle-income countries, a median of about 41% of adults with multiple partners reported using a condom the last time they had sex), voluntary medical male circumcision has been scaled up considerably. In 2013, 2.7 million men in the 14 priority countries in eastern and southern Africa underwent this procedure, 1 million more than in 2012. This brought to about 5.8 million the number of males who had undergone voluntary medical male circumcision. The increased momentum towards reaching the nearly 20 million male circumcisions that are needed to achieve 80% coverage among adolescent and adult males in these priority countries reflects growing acceptability of and investment in these services.

Annual number of voluntary medical male circumcisions performed in 14 priority countries in the WHO African Region, 2008–2013



Note: The data shown for Ethiopia apply only to the Gambella Region.

Sources: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS), WHO and health ministries.

Countries are increasingly adopting policies to seize new opportunities such as the use of ARV drugs to prevent HIV transmission. By June 2014, 28 of the 58 WHO HIV focus countries[2] had policies for offering ART to the HIV-positive partner in a serodiscordant couple, regardless of the partners' clinical or immune status.

The use of other, more longstanding interventions has also expanded, including measures to eliminate HIV transmission during health care procedures. The absolute numbers of HIV and hepatitis C virus (HCV) infections

[2] The 2014–2015 WHO HIV focus countries are: Angola, Bolivia (Plurinational State of), Botswana, Brazil, Burundi, Cambodia, Cameroon, Central African Republic, Chad, China, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Dominican Republic, Ecuador, El Salvador, Ethiopia, Ghana, Guatemala, Haiti, Honduras, India, Indonesia, Iran (Islamic Republic of), Jamaica, Kazakhstan, Kenya, Kyrgyzstan, Lesotho, Libya, Malawi, Morocco, Mozambique, Myanmar, Namibia, Nepal, Nigeria, Pakistan, Papua New Guinea, Paraguay, Philippines, Russian Federation, Rwanda, Somalia, South Africa, South Sudan, Sudan, Swaziland, Tajikistan, Thailand, Uganda, Ukraine, United Republic of Tanzania, Uzbekistan, Viet Nam, Yemen, Zambia and Zimbabwe.

transmitted through unsafe health care injections fell by 87% and 83%, respectively, during 2000–2010. Increasing numbers of countries have introduced or enhanced blood safety procedures, although about 24% of the blood donations in low-income countries are still not screened for one or more of HIV, hepatitis B virus (HBV) and HCV using basic quality procedures.

Too many children are still being infected with HIV

International efforts to eliminate the mother-to-child transmission of HIV continue to intensify. The number of children newly infected with HIV in low- and middle-income countries declined by 40% to an estimated 240 000 [210 000–280 000] in 2013, down from the estimated 400 000 [370 000–450 000] who acquired HIV infection in 2009, the baseline year for the Global Plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive.

Several improvements have led to these achievements. The number of pregnant women with HIV has remained relatively stable since 2009, but the proportion receiving recommended ARV regimens for prevention of mother-to-child transmission (PMTCT) of HIV has increased steadily. In 2013, about two thirds (67%, range 62–73%) of all pregnant women living with HIV in low- and middle-income countries – close to one million women – received ARV drugs that prevent mother-to-child transmission. By June 2014, almost half of the 58 WHO HIV focus countries had adopted the WHO recommendation to provide lifelong ART to all pregnant women living with HIV (option B+), and all 21 Global Plan priority countries in the WHO African Region now have guidelines officially endorsing options B or B+.

ART (triple drugs provided lifelong or during the MTCT risk period) is rapidly becoming the standard for pregnant women living with HIV, including in the 21 priority countries under the Global Plan in the WHO African Region.[3]

At current trends, the mother-to-child transmission of HIV may soon be virtually eliminated in some countries in which very low numbers of children are being newly infected with HIV.

Eliminating congenital syphilis and strengthening maternal, newborn and child health services form part of the efforts to prevent new HIV infections among children.

Greater efforts are needed to measure ARV coverage during the breastfeeding period and to ascertain the final outcomes of PMTCT interventions for mothers and children. The current failure to perform early infant diagnosis in even half of HIV-exposed infants is one of the major reasons for the low ART coverage among infants generally.

More people are being reached through diverse HIV testing approaches

The number of people who took an HIV test in 2013 in 77 reporting countries increased by 33% compared with 2009. The increased use of diverse testing approaches has been an important development. At the end of 2012, 95% of 102 reporting countries had explicit policies for provider-initiated testing and counselling in health facilities. Partner testing is also expanding rapidly, testing services are being moved closer to communities (85 of 119 countries were using community-based testing approaches in 2013) and self-testing is being used increasingly as an additional testing option.

Nevertheless, too many people remain unaware of their HIV infection: in most countries reporting data, less than half the people living with HIV have ever had an HIV test and received their test result. In countries with a high HIV prevalence, testing rates are generally lower for men than for women, and the use of HIV testing and counselling services remains especially low among adolescents and some key populations. Earlier diagnosis of people with HIV enables them to be linked to services, thus improving efforts to retain them in HIV care until they are eligible to initiate ART (in accordance with WHO guidelines).

[3] The 21 priority countries in the WHO African Region are Angola, Botswana, Burundi, Cameroon, Chad, Côte d'Ivoire, Democratic Republic of the Congo, Ethiopia, Ghana, Kenya, Lesotho, Malawi, Mozambique, Namibia, Nigeria, South Africa, Swaziland, Uganda, United Republic of Tanzania, Zambia and Zimbabwe. India is the only priority country outside the African Region.

With almost 13 million people receiving ART, HIV treatment is being expanded more rapidly than ever

Provision of ART has accelerated even further, with about 12.9 million people receiving ART globally at the end of 2013, 11.7 million of them in low- and middle-income countries. The 11.7 million people on ART represent 36% [34–38%] of the 32.6 million [30.7 – 34.8 million] people living with HIV in low- and middle-income countries. The additional 2 million people who started ART in 2013 marked the largest-ever annual increase in ART provision. At current trends, the target of placing 15 million people on ART by 2015 in low- and middle-income countries will be exceeded.

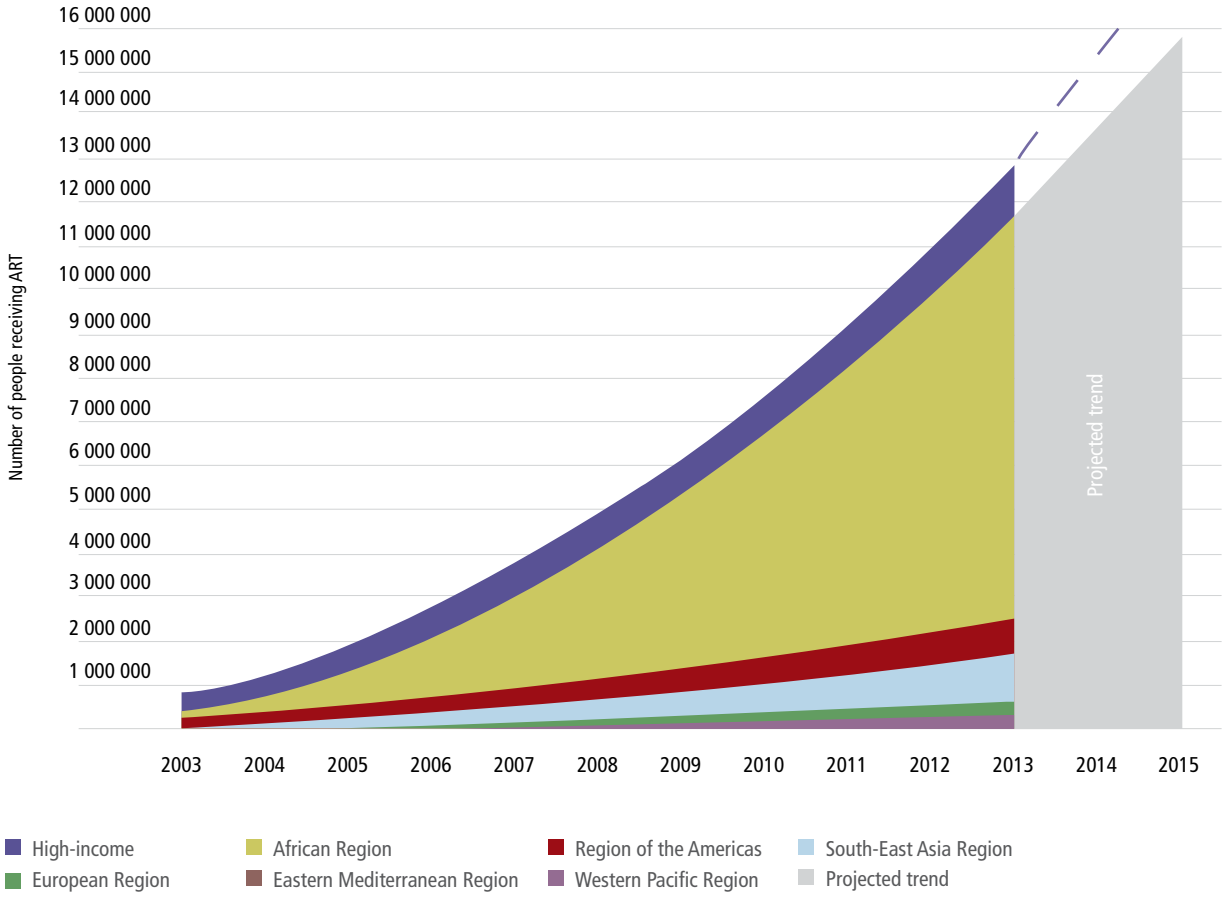
The annual number of people dying from HIV-related causes has decreased by 25% in recent years – from 2.0 million [1.8 – 2.1 million] in 2009 to 1.5 million [1.4 – 1.7 million] in 2013. Countries have reacted swiftly in adopting the new global WHO ARV drug guidelines that increase the number of people eligible for ART to about 85% of all people living with HIV, with close to half of the WHO HIV focus countries having increased the ART initiation threshold to ≤500 CD4 cells/mm^3 by June 2014.

Earlier treatment will save more lives – but it also increases the challenge to achieve the goal of treatment for everyone who is eligible in accordance with WHO guidelines. The 11.7 million people receiving ART in low- and middle-income countries in 2013 represented a little over one in three people living with HIV in these countries.

Progress in scaling up ART is not uniformly evident across the globe. ART continues to expand dynamically in the WHO African Region, especially in eastern and southern Africa. At the end of 2013, an estimated 37% of all people living with HIV in the Africa Region were receiving ART. However, the proportions of people with HIV receiving ART in the eastern parts of the WHO European Region and in the WHO Eastern Mediterranean Region still lag significantly behind those in other regions, although both regions have seen significant improvements in 2013.

ART provision is not expanding as rapidly for children as for adults. Provisional estimates show that, at the end of 2013, less than one quarter (23%, range 21–25%) of children

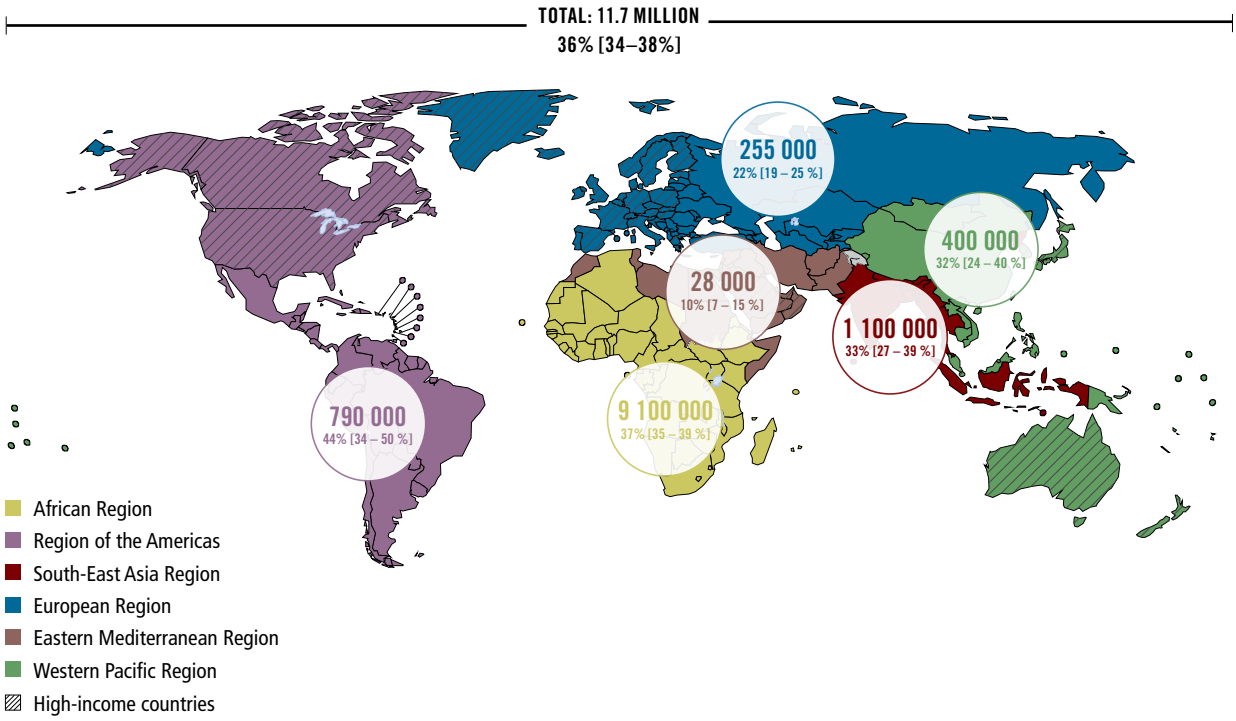
Actual and projected numbers of people receiving antiretroviral therapy in low- and middle-income countries by WHO region and in high-income countries across WHO regions, 2003–2015[a]



[a]Country income classification by the World Bank at the time of the 2011 Political Declaration on HIV and AIDS.

Source: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS)

Number of people receiving ART and percentage of all people living with HIV receiving ART in low- and middle-income countries overall and by WHO region, 2013[a]

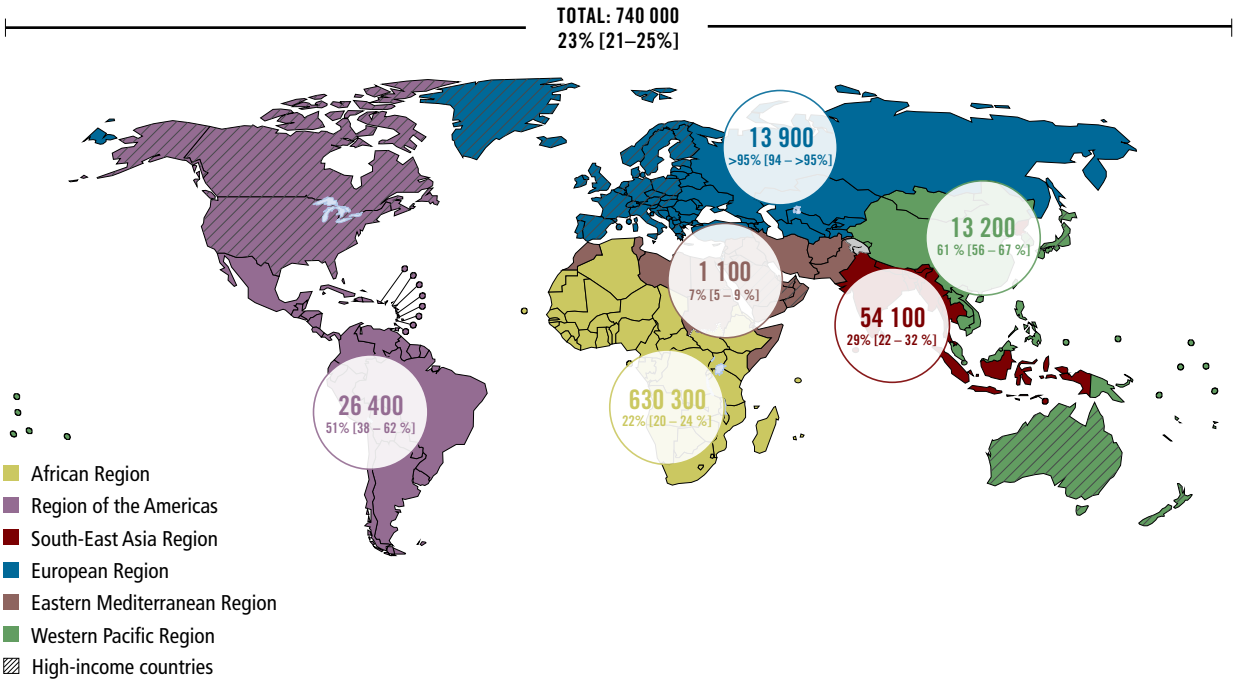


[a]Country income classification by the World Bank at the time of the 2011 Political Declaration on HIV and AIDS.

Source: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) and 2013 UNAIDS/WHO estimates.

(0–14 years) living with HIV in low- and middle-income countries were receiving ART in 2013, compared with more than one third (37%, range 35–39%) of adults living with HIV. Worryingly, the increase in access to ART for children was slower than for adults in 2013, and the ART coverage gap is widening.

Number of children receiving ART and percentage of all children living with HIV receiving ART in low- and middle-income countries overall and by WHO region, 2013[a]



[a]Country income classification by the World Bank at the time of the 2011 Political Declaration on HIV and AIDS.

Source: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) and 2013 UNAIDS/WHO estimates.

Early diagnosis of HIV infection among infants and treatments for children need to improve, and high-quality treatment and care services must reach more adolescents, especially as they transition from child to adult services. HIV has emerged as the second largest cause of death among adolescents globally. Available data suggest that key populations with HIV continue to be underrepresented among people receiving ART even though their treatment access has improved.

The overall goal of HIV treatment is to achieve long-term viral suppression and dramatically improve the survival rates of as many people living with HIV as possible. Identifying greater numbers of people living with HIV and then enabling them to start ART are therefore vital. No less important is the need to identify people living with HIV early and then to link them with and retain them in care so that they can gain the full benefits of ARV drugs. Countries need to consolidate the improvements made in these areas by strengthening referral and recordkeeping systems and through wider use of treatment support groups, point-of-care CD4 testing and viral load monitoring.

Linking services for HIV and comorbidities is saving lives

The expansion of co-managed HIV and TB services is significantly reducing mortality and morbidity. Based on provisional data provided for 2013, 48% of people with TB had an HIV test, and the number of people living with HIV reported to have been screened for TB has almost tripled since 2009. ART provision for people coinfected with notified TB and HIV rose from about 40% in 2009 to 70% in 2013, and the number of people dying from HIV-associated TB dropped by 36% from 2004 to 2011.

Nevertheless, ART coverage among people with both TB and HIV was still low in some countries with very large burdens of HIV and TB coinfection, and services need to expand considerably. TB remains a leading cause of death among people living with HIV. Further improvements require that TB and HIV services expand and that all opportunities be taken to screen people with TB for HIV and start ART, especially in countries with very large burdens of HIV and TB coinfection, mostly in the WHO African Region.

Many other coinfections and comorbidities tend to be more severe for people living with HIV – including viral hepatitis and various noncommunicable diseases. Viral hepatitis is a growing cause of mortality among people living with HIV, and the burden of HIV and viral hepatitis in different regions needs to be estimated better. Hepatitis screening, prevention and treatment are getting more global attention, and promising new treatments for chronic HCV infection hold great potential if they can be implemented at scale.

Women living with HIV have a high risk of cervical cancer, which is preventable and curable. But in some places, including in the countries of eastern and southern Africa with a high burden of HIV infection, coordinated national efforts to prevent, screen for and manage cervical cancer are scarce.

Chronic HIV care is a great opportunity to screen for, monitor and manage chronic noncommunicable diseases and mental health disorders. This is especially important for people 50 years and older who are living with HIV. In low- and middle-income countries they comprise about 10% of all adults with HIV, yet few HIV programmes currently respond to their needs.

Key populations are largely missing out on recent progress

Despite some improvements, HIV services are not reaching enough key populations, and the HIV prevalence among them remains very high in all regions. Studies show that men who have sex with men are 19 times and transgender women almost 50 times more likely to have HIV than the general adult population, and female sex workers are 14 times more likely to have HIV than other women.

Punitive laws and practices and a lack of political will remain major barriers blocking access to HIV prevention and treatment services. In some countries, a hostile context makes it difficult and even dangerous for nongovernmental organizations to provide services for certain key populations, including for men who have sex with men.

About two in three men who have sex with men were reportedly reached with HIV prevention programmes in the 109 countries providing these data during 2011–2013. But coverage varies considerably, and adequate government-sponsored HIV services for men who have sex with men remain rare in the WHO African Region and Eastern Mediterranean Region. A rising incidence of HIV infection in this key population is being reported in several places. The HIV needs of transgender people continue to be neglected or ignored, despite the high burden of HIV among them.

Although accurately estimating the coverage of HIV prevention services for female sex workers is still difficult, available data indicate that between two thirds

and three quarters of sex workers were being reached with HIV prevention programmes in the 114 countries that reported these data during 2011–2013. Condom use during sex work appears to be relatively common in many countries and could be increasing. Service provision and access varies considerably between regions and countries, however, and tends to be insufficient in much of the WHO African Region.

In too many places, lack of political will still blocks comprehensive services for people who inject drugs. Even though needle and syringe provision has expanded in some countries, current service coverage is not sufficient to stabilize or reverse HIV epidemics in this population. Worldwide, 79 countries reported offering opioid substitution therapy in 2013, but two thirds of them were providing it to 40% or less of the opioid-dependent people who inject drugs.

HIV services are mostly lacking in prisons and other closed settings. Needle and syringe programmes were available in prisons in only eight countries, and opioid substitution therapy was available in prisons in about 40 countries, mostly in Europe and the Americas. Very few countries provide ART in prisons.

The HIV response is strengthening public health systems

Wide-ranging improvements are being seen in the coverage and quality of health provision as HIV services are adapted and integrated with other health programmes and services. The benefits include expanding human resource capacity through task-shifting and task-sharing, stronger health service management to provide chronic care, innovations that link patients more reliably to care, approaches to support adherence and retention in long-term care and fortifying community systems.

HIV programmes have played a key role in advocating for, funding and implementing harm-reduction programmes for people who use drugs in many countries, with new interventions to prevent opioid overdose as well as to prevent and manage hepatitis B and C infection being included.

Collaboration between HIV and TB programmes is fostering model programmes for integrating HIV and TB service delivery. More than half of 105 countries reported that they had either fully integrated or strengthened the joint provision of HIV and TB services, and more than half the WHO focus countries said they had integrated their TB and ART services, with ART being provided in TB clinics in almost half of them.

HIV testing is being linked to a varying extent with child immunization services and is being offered in paediatric inpatient wards, nutrition support programmes, community childcare services and other child health services. Links with other programmes were also consolidated, including with antenatal care services and sexual and reproductive health services. The unmet need for family planning, however, remains high among women living with HIV. The progress seen in integrating and linking programmes now needs to be supplemented with reliable methods for measuring the impact of integrated or linked services and for determining how best to organize such services.

Fresh approaches are generating broader benefits

HIV programmes are pioneering approaches that are paving paths toward achieving universal health coverage. Despite concerns that the pressures of HIV programmes might overwhelm health systems, in many countries, health services – including primary health care, outreach services and laboratory systems – are now generally stronger and more versatile.

The use of task shifting and decentralization is helping stressed health care systems to expand services without comprising quality – especially ART and services for preventing the mother-to-child transmission of HIV in the WHO African Region.

In mid-2013, 27 of 65 reporting countries, mostly in the WHO African Region, had policies that allow nurses to initiate ART for some groups of people. And more than 50% of the countries surveyed in the WHO African Region and 15–30% of countries in other regions now use community health workers to support ART provision. These adaptations are boosting the reach of HIV and other health services.

Reliance on volunteers and community vitality, however, cannot compensate for inadequate public-sector infrastructure and services. The fundamental duty of ensuring universal health coverage still rests with government leadership, including investing in strengthening community systems, which are critical for delivering sustainable and acceptable services. Fulfilling this duty presupposes having long-term human resource planning for health services – both public and private – and using quality-assurance measures, capacity-building and arrangements for integrating community-based support solidly into formal health systems.

HIV responses continue to deploy methods that can protect people against the financial risks associated with health

problems. Direct, out-of-pocket payments for health services are declining and increasingly being replaced with various pooling and prepayment arrangements as well as with conditional cash transfer and voucher systems. This forms part of a wider shift towards structuring domestic spending on health in ways that can enable everybody to use the full-range of health services they need.

Domestic expenditure is now the single largest source of funding for ART programmes in some countries, and countries are experimenting with new funding methods. Nevertheless, many countries, specifically low-income countries, cannot realistically fund adequate services all on their own. In 2012, 51 countries relied on international sources for more than 75% of their HIV-related spending (especially for ART programmes and services for key populations). External funding remains vitally important.

Other improvements include the continuing drop in the prices of ARV drugs, because of greater predictability of demand, economies of scale, increased competition among manufacturers and voluntary licensing. In 2013, generic manufacturers supplied 98% of all ARV drugs in low- and middle-income countries, at competitive prices. WHO-recommended first-line regimens containing tenofovir can now be administered for a median price of about US$ 115 per person per year in low- and middle-income countries.

Although still high, the prices of second-line ARV regimens have also fallen significantly, with most low- and middle-income countries able to access second-line treatment at about US$ 330 per person per year. However, price reductions remain highly uneven, and many upper-middle-income countries continue to pay higher prices than they can afford, while options beyond second-line therapy remain extremely costly.

Equity and rights are on the agenda, but action needs to intensify

HIV advocacy has sharpened awareness of the importance of health equity, gender equality and human rights – in their own right and for public health. These dimensions are improving but too slowly. Although effective interventions exist and political commitment appears to be increasing, suitable action is still irresolute and isolated in most countries. Stronger public health advocacy and political momentum need to be mobilized to promote policies and programmes that reflect the centrality of human rights for good public health practice.

Gender inequalities and gender violence are major unmet challenges that continue to contribute to the disproportionately high incidence of HIV infection among women and girls in generalized HIV epidemics. In eastern and southern Africa, young women are more than twice as likely to have acquired HIV than their male counterparts.

Those disparities are also partly shaped by gender-based violence, which remains a problem of epidemic proportions worldwide and is a great risk factor for HIV infection. Women who experience intimate partner violence are about 1.5 times more likely to be living with HIV than women who are spared such violence.

Promising recent findings include evidence that empowering women economically can cut their risk of acquiring HIV infection and that the HIV risk for women and girls tends to diminish significantly the further they progress in secondary school. More countries are experimenting with such interventions, which need to be translated into systemic improvements.

Meanwhile, the legal environments in many countries still block or diminish the impact of HIV services, although some improvements are occurring.

Most countries retain laws that either criminalize or sanction the persecution of people who are at higher risk of HIV infection. Many also have laws or policies that restrict the provision of certain health services that are particularly relevant to key populations, especially people who inject drugs. Indeed, more than 40% of national governments in 2013 reported having laws, regulations or policies that can hinder effective HIV services for key populations.

Homophobic laws and practices have serious public health consequences, yet more than 70 countries criminalized same-sex relations in 2013, and several countries have passed new laws that further criminalize lesbian, gay, bisexual and transgender people. A more encouraging development is the shift, mostly in some high-income countries at the moment, to give priority to public health approaches as alternatives to criminalizing the behaviour of certain key populations – notably sex workers and men who have sex with men.

Stigma and discrimination against people living with HIV and key populations in health care settings continue to undermine HIV responses. But countries are increasingly documenting, publicizing and acting to reduce the harmful impact of stigma and discrimination. And although some countries retain laws that potentially sanction discrimination against people living with HIV, about 60% of countries around the world reported having anti-discrimination laws that protect people living with HIV.

Conclusion

The global HIV response is now operating more firmly as part of a broader health and development agenda. The growing momentum of the HIV response has the potential to significantly benefit wider public health even more profoundly in years to come. This fits with the increasing prominence of the concept of universal health coverage, which affords all people access to health services of sufficient quality without subjecting them to financial hardship.

The goal of ending the AIDS epidemic is emerging as a possible key element of a post-2015 sustainable development framework. The achievements described in this report confirm that the AIDS epidemic can be ended. But it is also clear that much more needs to be done, particularly in improving the quality of services, reaching the key populations and others being left behind, promoting health equity in which all health needs are addressed and ensuring social and financial security so that programmes are sustainable. A robust HIV response will contribute significantly to broader health and development goals as the world advances into the post-2015 era.

A snapshot of progress in implementing the Global Health Sector Strategy on HIV/AIDS 2011-2015

Strategic Direction 1

OPTIMIZE HIV PREVENTION, DIAGNOSIS, TREATMENT AND CARE OUTCOMES

Increasing condom use		Reduced external investment in condom procurement and mixed trends in condom use
Reducing and managing sexually transmitted infections		Some progress, but the pace needs to quicken
Expanding voluntary medical male circumcision		Significant progress in some countries; new male circumcision devices provide opportunities for scaling up, but coverage is still much too low overall
Reaching key populations with HIV services		Effective interventions exist, but they are not being implemented at sufficient scale
Using ARV medicines to prevent HIV infection		More countries are expanding ART eligibility to leverage prevention efforts
Expanding coverage of services to prevent the mother-to-child transmission of HIV		Major advances in some countries, increasing commitment tied to the Global Plan, but insufficient coverage overall
Expanding and improving treatment of children		Progress in some regions, but coverage lags behind that of adults
Expanding and optimizing ART		Strong progress and on track to reach targets
Expanding HIV testing and counselling		Progress in diversifying testing and counselling models and use of new diagnostics, but inadequate coverage
Strengthening retention in care and adherence to treatment		Attrition remains a major problem, but improving regimens and adherence support offer opportunities for progress
Monitoring and managing resistance and toxicity		Drug resistance is still limited; toxicity monitoring systems are being developed

Strategic Direction 2

ENHANCE BROADER HEALTH OUTCOMES

Integrating TB and HIV services		Strong model programmes and collaborative policy frameworks, but implementation can broaden
Integrating and linking HIV with maternal, newborn and child health services and sexual and reproductive health services		Good models of integrated services (especially for preventing mother-to-child transmission), but coverage can widen
Linking and integrating HIV and harm-reduction programmes		Good models of integrated prevention and care, but coverage is inadequate and major legal and political constraints persist
Linking and integrating HIV and noncommunicable disease programmes		Growing awareness needs to be translated into actual services
Linking and integrating HIV and viral hepatitis treatment services		Increasing investment and interest, and new treatments offer hope

Strategic Direction 3

BUILD STRONG AND SUSTAINABLE HEALTH SYSTEMS

Enhancing service delivery methods		New models of service delivery, but infrastructure and basic resources remain inadequate in many countries
Strengthening community systems		Good models for community systems strengthening, but greater funding and capacity-building are required
Enhancing strategic information		New systems and methods being introduced, but data quality needs to improve
Making health system funding sustainable		Increasing domestic funding and innovative funding channels, but challenges remain, especially for low-income countries
Building human resources for health		New approaches to task-shifting and community systems strengthening are improving service delivery, but basic capacity constraints remain a concern
Improving access to medicines and diagnostics		Major reductions in prices and innovations in ARV regimens and point-of-care diagnostics

Strategic Direction 4

REDUCE VULNERABILITIES AND REMOVE STRUCTURAL BARRIERS

Advancing gender equality and removing harmful gender norms		Increasing awareness and promising approaches, but too little decisive and systematic action to enhance gender equality
Safeguarding human rights and enhancing health equity		Continued stigma and discrimination, disparities in access to essential services and criminalization of key populations. Progress in a few countries, but a worsening situation in others

Note: In this publication, a "traffic light" graphic is used to summarize progress made under each of the main areas of the HIV response. The grading used is subjective in nature but aims to visually highlight areas of concern and achievement. The graphics also aim to reflect the varied responses across countries and settings. For each major area, a traffic light grading is provided, with a brief rationale for the grading.

Green: On track to meet agreed targets; good programme coverage; evidence of successful implementation of interventions; examples of good practice exist.
Yellow: Progress is lagging; targets could still be achieved with intensified and accelerated action; the coverage and quality of programmes need to improve.
Red: Targets are unlikely to be met; substantial overhaul of the response may be required.
Cross-hatched "traffic lights" indicate significant variation in the response, including in quality and equitable coverage and across countries and regions.

INTRODUCTION

The threats posed by the HIV epidemics to public health and development were recognized more than 30 years ago. The health sector has continued to play the central role in the HIV response while acknowledging the multidimensional nature of HIV epidemics.

Challenges posed by HIV epidemics have emboldened public health thinking and stimulated powerful innovations in health technologies and clinical practice. They have focused attention on crucial social and health inequities and have inspired spirited activism and pioneering partnerships for health – to great effect.

In its early phases, the HIV response was geared for dealing with the epidemics as public health emergencies. That stance has steadily evolved into an approach in which HIV infection is addressed increasingly as a chronic manageable condition.

By 2010, the global HIV response had reached a critical juncture. The 2006 United Nations General Assembly commitment to universal access to HIV prevention, treatment, care and support had not been realized by the target year of 2010. The global economic downturn threatened HIV investment, placing even greater emphasis on more efficient and effective HIV strategies and technologies. There were increasing calls for the HIV response to be "taken out of isolation" and to be integrated and balanced within overarching public health and development strategies to achieve broader and more sustained impact.

It was in that context that the global health sector strategy on HIV/AIDS 2011–2015 was developed to guide the expansion of the global HIV response beyond the HIV-specific programmes of the past, by strategically positioning HIV issues within a rapidly changing health and development agenda.

Although the strategy builds on core HIV programmes, it is designed to maximize linkage and synergy with other key public health areas. It aims to improve broader health outcomes, to strengthen health and community systems for sustainable action, to influence other sectors to adopt pro-health policies and approaches that foster enabling environments and to address the underlying social and structural determinants of HIV epidemics.

This report reviews the progress made in implementing the strategy during the past three years. In doing so, it provides a comprehensive update on the global health sector response to HIV. At a time when the post-2015 agenda is being conceptualized and negotiated, the report also contributes to the global dialogue on the future directions of the HIV response.

The goals of the strategy are zero new HIV infections, zero AIDS-related deaths and zero discrimination in a world in which people living with HIV are able to live long, healthy lives. Reaching those goals requires drastically expanding the coverage and improving the quality of HIV prevention, diagnosis, treatment and care services. The strategy was explicitly designed to help achieve these outcomes.

This report reviews progress in the health sector response along each of the strategy's four strategic directions and discusses the opportunities for overcoming the remaining challenges to achieve universal access to effective HIV interventions and for contributing to the broader goal of universal health coverage.

Strategic direction 1: Optimize HIV prevention, diagnosis, treatment and care outcomes

This appraises the core package of HIV-specific interventions and approaches, how to improve their quality, effectiveness and coverage, how to combine and integrate them into comprehensive programmes for various populations and settings and how to identify and rapidly apply innovations in HIV interventions as new evidence emerges.

Strategic direction 2: Leverage broader health outcomes through HIV responses

This considers how HIV programmes can be linked with other health programmes to optimize both HIV and other health outcomes. The greatest synergy can be achieved by linking HIV with sexual and reproductive health, maternal, newborn and child health, TB, drug dependence and harm reduction and blood and injection safety programmes. As people with HIV live longer with antiretroviral therapy (ART) and consequently experience health conditions related to ageing and HIV therapy, linking HIV and chronic care programmes will be critical, notably primary health care and noncommunicable disease services.

Strategic direction 3: Build strong and sustainable systems

This examines the interrelationship between HIV-specific programmes and general health and community systems. Effective, efficient and comprehensive health and community systems are vital for ensuring accessible, affordable and sustainable HIV services. At the same time, HIV innovation and investment are helping to transform health systems and empower communities in ways that benefit other public health and social areas.

Strategic direction 4: Reduce vulnerability and remove structural barriers to accessing services

This considers the critical roles of other sectors and structural factors in determining individual and

population-level vulnerability to and risk of HIV infection, the dynamics of HIV epidemics and the feasibility and effectiveness of responses. An effective HIV response requires enabling environments and should promote health equity, gender equality and human rights, with particular focus on addressing the needs of key populations.

As this report shows, substantial progress has been made in the past few years, especially in areas in which clear service delivery targets have been set – such as HIV treatment, preventing the mother-to-child transmission of HIV (PMTCT) and preventing and treating TB and HIV infection. But the report also highlights the current unevenness of the HIV response – across countries, communities, populations and interventions – and it identifies areas in which progress has been slow and the 2015 targets appear to be out of reach.

As we move towards 2015, a dual challenge confronts us: to safeguard the considerable gains already made and to extend them by ensuring that the unfinished business of achieving universal access is firmly embedded in the post-2015 agenda.

Chapter 2. INVIGORATE HIV PREVENTION

Key Messages

Prevention gains need to widen and become better focused

With an expanding repertoire of highly effective HIV prevention interventions available, approaches need to be tailored and efforts focused on settings and populations in which HIV transmission is occurring.

- Since 2009, the number of annual new HIV infections globally has decreased by only about 15% - from 2.5 million [2.3 – 2.7 million] in 2009 to 2.1 million [1.9 – 2.4 million] in 2013.
- Despite progress in recent years, the full preventive potential of condoms is still not being fully realized. Only about 41% of the adults with multiple partners reported using a condom the last time they had sex, with similar low use among young people. Between 2011 and 2012, donors reduced their supply of male condoms (from 3.4 to 3.1 billion) and female condoms (from 43.4 to 31.8 million).
- Uptake of voluntary medical male circumcision in 14 priority countries in Africa rose from 1.7 million in 2012 to nearly 2.7 million in 2013, with the biggest increases occurring among men younger than 25 years.
- Access to accurate sex education and to high-quality, youth-friendly HIV and sexual and reproductive health services remains inadequate in most countries.
- By June 2014, 28 of the 58 WHO HIV focus countries[1] had policies offering antiretroviral therapy (ART) to the HIV-positive partner in a serodiscordant couple irrespective of clinical or immune status, recognizing the prevention benefits of ART.
- The absolute numbers of HIV and hepatitis C virus (HCV) infections transmitted through unsafe health care injections fell by 87% and 83%, respectively, during 2000–2010.
- About 24% of blood donations in low-income countries are not screened for one or more of HIV, hepatitis B virus (HBV) and HCV using basic quality procedures.
- Oral pre-exposure prophylaxis of HIV is effective among different populations but is best considered as an option within a broader combination prevention package.
- Post-exposure prophylaxis of HIV infection is being used inconsistently in countries. WHO is releasing new guidelines on post-exposure prophylaxis in 2014 to promote more standardized and effective use.
- More than 30 clinical trials of HIV vaccines, testing a variety of candidates and vaccine concepts, are currently underway (Phases I and II).

The headline goals of the HIV response involve reducing both new HIV infections and HIV-related deaths among adults and children. Strategic direction 1 of the Global Health Sector Strategy on HIV/AIDS 2011–2015 focuses on initiatives and systems to improve the quality, effectiveness and reach of HIV-specific interventions and approaches. It features four core elements:

1. Invigorate HIV prevention;
2. Eliminate HIV infections among children;
3. Catalyse the next phase of diagnosis, treatment, care and support; and
4. Provide comprehensive, integrated services for key populations.

Preventing people from becoming newly infected with HIV requires that HIV responses give priority to high-quality, evidence-based interventions in the settings and populations in which most HIV transmission is occurring. Increasingly, this means reaching populations that are at higher risk of HIV infection but are not adequately served by current programmes. Mostly positive, often impressive trends have been seen since 2009, although important gaps remain to be overcome.

[1] To ensure that limited resources are allocated for the most impact, WHO has identified 58 focus countries for its HIV programme activities in 2014–2015. These include the 38 high-impact countries identified by UNAIDS, the 22 Global Plan countries and other countries identified by WHO regional offices as having strategic importance. Additional countries will be supported depending on needs and available resources. The 2014–2015 focus countries are: Angola, Bolivia (Plurinational State of), Botswana, Brazil, Burundi, Cambodia, Cameroon, Central African Republic, Chad, China, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Dominican Republic, Ecuador, El Salvador, Ethiopia, Ghana, Guatemala, Haiti, Honduras, India, Indonesia, Iran (Islamic Republic of), Jamaica, Kazakhstan, Kenya, Kyrgyzstan, Lesotho, Libya, Malawi, Morocco, Mozambique, Myanmar, Namibia, Nepal, Nigeria, Pakistan, Papua New Guinea, Paraguay, Philippines, Russian Federation, Rwanda, Somalia, South Africa, South Sudan, Sudan, Swaziland, Tajikistan, Thailand, Uganda, Ukraine, United Republic of Tanzania, Uzbekistan, Viet Nam, Yemen, Zambia and Zimbabwe.

2.1 Preventing the sexual transmission of HIV

Along with the natural dynamics of HIV epidemics, changes in sexual behaviour have been central to the observed declines in the number of people acquiring HIV infection, especially in countries with a high prevalence of HIV infection *(1)*. The changes are especially evident among adolescents and young people. In many low- and middle-income countries, adolescents (aged 10–19 years) are reporting that they have fewer sexual partners, and young people (ages 15–24 years) report that they are becoming sexually active at later ages than in the past. Still not high enough overall, condom use has increased in several regions, but in some settings it has stabilized or even decreased in the past few years *(2)*.

Importantly, there has been a shift, albeit modest at this stage, toward giving priority to high-quality, evidence-based interventions in the settings and populations in which most HIV transmission is occurring. Some evidence indicates strengthened efforts to reach key populations that are at higher risk of HIV infection with acceptable and effective services, but coverage remains low in most settings (see Chapter 7).

In addition to approaches aimed at bringing about behavioural changes, numerous biomedical interventions are being introduced or are featuring increasingly in countries' HIV responses. They include initiating ART regardless of CD4 cell count (for serodiscordant couples), voluntary medical male circumcision (in settings with a high prevalence of HIV infection in eastern and southern Africa), pre-exposure prophylaxis and post-exposure prophylaxis.

In 2013, an estimated 2.1 million [1.9 – 2.4 million] people were newly infected with HIV globally - only 15% less than the 2.5 million [2.3 – 2.7 million] people in 2009. The progress being made needs to accelerate and widen to reach the target of the 2011 United Nations High-Level Meeting of reducing sexual transmission of HIV by 50% between 2010 and 2015, and the target of the Global Health Sector Strategy on HIV/AIDS of reducing by 50% between 2009 and 2015 the percentage of young people (aged 15–24 years) newly infected with HIV.

Three challenges, in particular, deserve emphasis.

First, a trend toward protective behavioural change is not evident everywhere. Although monitoring behaviour changes can be challenging, a recent survey points to significant increases in the numbers of sexual partners in some countries (Burkina Faso, Congo, Côte d'Ivoire, Ethiopia, Gabon, Guyana, Rwanda, South Africa, Uganda, the United Republic of Tanzania and Zimbabwe), as well as a decline in condom use in a few countries (in Côte d'Ivoire, Niger, Senegal and Uganda, for example) *(3)*.

Second, adolescents and young adults comprise a significant proportion of the people newly infected with HIV, which runs contrary to the goal of achieving an AIDS-free generation. People 15–24 years old comprised about one third of the people who acquired HIV infection globally and in the WHO African Region in 2013. About one third of these young people – an estimated 300 000 [240 000–380 000] – were 15–19 years old.

Adolescents are vulnerable to HIV because of the physical and emotional transitions, and potentially heightened risk-taking behaviour, that often occur during this period of life. This is particularly true for adolescents who live in settings with generalized HIV epidemics – especially girls in the WHO African Region who often face a higher risk of infection than boys – and/or adolescents whose risk profiles categorize them as key populations at higher risk of acquiring HIV.

Reducing the number of adolescents and young adults acquiring HIV infection more quickly requires improving access to HIV services, along with sexual and reproductive education and health services that are youth-friendly and of high quality. It also requires much stronger efforts to remove gender inequalities. For example, boys and young men tend to report using condoms more often than do girls and young women, but they are less likely to take HIV tests.

Third, key populations continue to have disproportionately high HIV prevalence, especially men and transgender women who have sex with men, people who inject drugs, sex workers and prisoners. They represent most of the people affected by HIV outside the WHO African Region and comprise an increasingly recognized share of the people newly infected in urban settings within the African Region. In most low- and middle-income countries, these key populations are still poorly served with evidence-based HIV interventions, since legal and social barriers compromise their access to services. In addition, rising incidence of HIV infection has also been reported in some communities (especially men who have sex with men) in which, until quite recently, recognized and successful HIV prevention programmes were being implemented *(4–8)*.

2.1.1 Condom use can be expanded further

Correct and consistent use of condoms remains one of the most efficient methods for preventing the transmission of HIV and other sexually transmitted infections, and for avoiding unplanned pregnancies *(9)*. Despite progress in recent years, the full potential benefits of condoms are still not being realized.

According to the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS), in the 71 countries reporting for 2013 a median of 44% of adults of both sexes with multiple sexual partners said they used a condom the last time they had sex. In only four of the 16 countries in the WHO African Region with recent national data (Table 2.1) did more than two thirds of adult men say they used a condom at their last higher-risk sex, and in only three of the 16 countries did more than half of adult women say this.

In several countries in the WHO African Region, however, condom use among people 15–24 years old appears to be rising. Data from 20 countries that have carried out more than one population-based survey indicate increasing condom use among young people who reported having multiple sexual partners in the previous 12 months. But condom use was by no means the norm. On average, only about one third of the young women and one half of the young men reported using a condom the last time they had higher-risk sex, and in some countries condom use levels remain very low (*11*). In only three of the 12 countries with survey data since 2009 did more than half the young women say they used a condom at last higher-risk sex, and in only six of the 12 countries did more than one half of the young men provide the same response.

Among the surveyed men who have sex with men, reported median condom use at the last anal sex, at about 63%, is low and changed little from 2009 to 2013 *(1)*. The levels of condom use in this key population vary across and within regions, including in the WHO South-East Asia Region, where condom use ranged from as low as 31% in Bangladesh to 86% in Thailand.

Table 2.1. Percentage of women and men 15–49 years old using a condom at last higher-risk sex, selected countries in the WHO African Region, 2010–2012

Country	Survey	% of women 15–49 years	% of men 15–49 years
Benin	2011–2012 DHS	30	22
Burkina Faso	2010 DHS	62	27
Cameroon	2011 DHS	37	43
Côte d'Ivoire	2011–2012 DHS	30	36
Ethiopia	2011 DHS	47	16
Gabon	2012 DHS	44	51
Guinea	2012 DHS	32	25
Malawi	2010 DHS	27	25
Mozambique	2011 DHS	31	26
Niger	2012 DHS	2	4
Nigeria	2012 National HIV/AIDS and Reproductive Health Survey (NARHS)	29	20
Rwanda	2010 DHS	29	28
Senegal	2010–2011 DHS	22	21
South Africa	2012 South African National HIV Prevalence, Incidence and Behaviour Survey	50	59
Uganda	2011 DHS	31	19
United Republic of Tanzania	2011–2012 Tanzania HIV and Malaria Indicator Survey	27	27
Zimbabwe	2010–2011 DHS	48	33

This indicator is defined as the percentage of women and men 15–49 years old who had more than one partner in the past 12 months who used a condom during their last sexual intercourse.

Sources: STATcompiler [online database] *(10)* and Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS).

Encouragingly, however, the use of condoms and condom-compatible lubricants appears to have become more common during sex work, at least among those sex workers who participated in surveys: globally, median condom use at last paid sex was 85% in 2013 in the 84 countries furnishing those data, up from 78% in 2009 *(1)*. Condom use during paid sex varies considerably in the WHO African Region. In three of the 12 countries (Cameroon, Gabon and Zimbabwe) with data from large, population-based surveys since 2009, more than 80% of men who had paid for sex in the previous 12 months said they had used a condom at the last commercial sex, but in another four countries (Ethiopia, Malawi, Mozambique and the United Republic of Tanzania) about one half or fewer of those men gave the same response.

According to the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS), behavioural surveys conducted in the WHO Western Pacific Region generally indicate high levels of condom use during commercial sex – exceeding 90% in Cambodia, Mongolia and Viet Nam in recent years, for example. Similarly, according to the Global AIDS Response Progress Reporting, in some countries in the South-East Asia Region, female sex workers have been reporting high levels of condom use at the last commercial sex – exceeding 80% in Nepal, Sri Lanka and Thailand, for example. However, much lower levels of condom use have been reported among women performing "direct" sex work (sold and taking place on the premises in which the women work) in some countries – a mere 35% in Indonesia, for example.

Achieving greater impact with condom programmes requires concerted action in several respects.

Several countries have had a considerable shortfall in condoms. According to the UNFPA, in 2011 in sub-Saharan Africa only nine condoms were distributed per man per year and only one female condom for every 10 women per year *(12)*. Donors were the main source of these condoms, since many low- and middle-income countries do not have a budget line for condom procurement. Meanwhile, the distribution of female condoms doubled from 25 million to 50 million units between 2007 and 2010 and continues to increase. However, the distribution and availability of female condoms remains considerably lower than for male condoms and accounts for much less than 1% of global condom procurement *(13)*.

Funding constraints are one factor holding back efforts to widen access to both male and female condoms. International donors are the main funders of condom programming in many countries, but funding uncertainties complicate national forecasting, procurement, supply and distribution (Box 2.1) *(1)*. In 2012, the donor community reduced their supplies of both male and female condoms compared with 2011. About 3.1 billion male condoms and 31.8 million female condoms were donated in 2012 versus 3.4 billion male condoms and 43.4 million female condoms in 2011 *(14)*. Country reports confirm that condom access dropped in 2012 *(1)*.

The main external donors for HIV programmes – the United States President's Emergency Plan for AIDS Relief *(15)* and the Global Fund to Fight AIDS, Tuberculosis and Malaria – recognize the need to support comprehensive condom programming, including support for national strategic planning, condom promotion to boost demand for both male and female condoms, national commodity forecasting, targeted distribution and emergency mechanisms to prevent and manage condom stock-outs. However, achieving a balanced portfolio of investment, in which condom programming is given adequate priority, may be a challenge for the future, as donors are requested to fund an increasing range of HIV interventions.

Alongside the need for increased supplies of both male and female condoms is the need to stimulate the demand for condoms. This can be done by diversifying condom marketing, in both the public and private sectors, and by changing community norms. Civil society organizations and networks play important roles in influencing social norms and improving access to condom supplies, especially through outreach programmes.

Even with longstanding prevention tools such as condoms, there are opportunities for innovation to make them more acceptable and effective. New condom materials and designs are being developed, and new marketing methods are being tested. Emulating these and other efforts, such as the Next Generation Condom challenge of the Bill & Melinda Gates Foundation *(16)*, and specifically focusing on increasing user acceptability, will help popularize condom use.

2.1.2 Gains in HIV knowledge are stalling

Behaviour change interventions are intended to provide individuals and communities with the information, motivation and skills they need to assess their risks and to change their behaviour and norms in ways that reduce HIV vulnerability and risk. Such interventions usually form part of a larger comprehensive package of services. If they are to be successful, the interventions require access to certain commodities or services, such as condoms or sterile injecting equipment. Similarly, all "biomedical" interventions have behavioural components that have to be considered. For example, condoms need to be used properly and consistently if they are to be effective in preventing sexually transmitted infections or unwanted pregnancies. Likewise, certain types of behaviour need to be adopted to achieve adherence to pre-exposure prophylaxis.

Across low- and middle-income countries overall, levels of HIV knowledge remain low and the improvements in recent years have been slight. Globally, a median of only 31% of young people in 89 surveyed countries demonstrated accurate knowledge of HIV transmission in 2013.

Population-based surveys done in the WHO African Region show the proportions of people 15–24 years old demonstrating comprehensive and accurate understanding of HIV varied little from 2002 to 2011: they increased

Box 2.1. Guidance for assuring the reliable procurement of quality condoms

WHO's contribution to condom programming focuses on global guidance to support the manufacture, prequalification and distribution of high-quality male and female condoms and lubricants. Jointly with UNFPA, WHO establishes global standards and product specifications for both male and female condoms and provides a prequalification scheme to ensure that condom procurers are able to purchase condoms from manufacturers that meet the required quality requirements.

In addition, WHO and UNFPA provide guidance on the procurement and distribution of condoms and lubricants *(17)*. Recent publications include *Scientific and technical requirements to formulate a female condom generic specific specification and prequalification scheme (18)* and *Use and procurement of additional lubricants for male and female condoms (19)*, which complement existing WHO and UNFPA guidance on male latex condoms. WHO is also issuing recommendations on the use of condoms in its guidelines for HIV services for men who have sex with men, sex workers and people who inject drugs *(20)*.

by about 5 percentage points for men and 3 percentage points for women but remained low, at about 36% for young men and 28% for young women *(1)*. The most recent published DHS Program survey data (for 2011–2012) in this region show that only one fifth or less of young women were able to demonstrate comprehensive knowledge of HIV in Côte d'Ivoire *(21)*, Guinea *(22)* and Niger *(23)*, as could only one third or less of their male peers in these three countries and in Benin *(24)*.

All countries in the WHO African Region have HIV prevention programmes that reportedly focus on young people, especially in school settings *(11)*, but the quality and impact of some of these efforts are questionable. Programmes are sometimes implemented haphazardly, are insufficiently tailored to the needs of the intended beneficiaries and are seldom sensitive to gender dynamics *(1)*. Moreover, access to accurate sex education and to high-quality, youth-friendly HIV and sexual and reproductive health services remains inadequate in most countries, both in the WHO African Region and beyond.

The situation in relation to changes in sexual behaviour among young people is quite mixed. Evidence indicates that some adolescents are increasingly aware of their sexual risks, are delaying sexual debut or adopting safer practices and are also able to articulate their HIV and sexual and reproductive health needs *(25)*.

However, there are concerns that, in some countries, the current generation of adolescents and young people may be less well equipped – or less able – to protect themselves from HIV than many previous generations. For example, in South Africa, the percentage of women 15–19 years old who had sexual relationships with partners at least five years older than them (an important risk factor for acquiring HIV) rose from about 19% to 34% between 2002 and 2011 *(26)*. Condom use levels among women 15–24 years old in South Africa rose between 2002 and 2008 (from 46% to 67%) but then declined to 50% in 2011 *(26)*.

People living with HIV play vital roles in supporting HIV prevention efforts. Providing support that enables people living with HIV to safely disclose their HIV status, access prevention commodities and services and adhere to HIV therapy has major benefits. Such support is especially important for adolescents who are living with HIV and who are sexually active *(27,28)*.

2.1.3 Voluntary medical male circumcision is gaining momentum

The scaling up of voluntary medical male circumcision holds great potential for further reducing the number of people acquiring HIV infection in eastern and southern Africa. The rationale for such expansion is supported by compelling evidence from three randomized clinical trials and observational studies that showed a reduction of about 60% in the risk of female-to-male sexual transmission of HIV *(29–31)*.

Following recommendations from WHO and UNAIDS in 2007 *(32)*, this procedure has been promoted intensively in 14 priority countries in the African Region. The strategic framework, which WHO and several international partners published in 2011 *(33)*, includes an ambitious target of achieving 80% coverage of male circumcision among adolescent and adult males and establishing sustainable services for adolescents and for infants up to two months of age.

Uptake was initially perceived to be slow while policies, programmes and services were being established, but by the end of 2013 an impressive cumulative total of 5.8 million males had undergone voluntary medical male circumcision. According to the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) and data from health ministries, the number of circumcisions performed annually rose from close to 900 000 in 2011 to more than 1.7 million in 2012 and nearly 2.7 million in 2013 (Fig. 2.1), reflecting a considerable increase in momentum, service delivery and acceptance by men.

Thus far, the programmes appear to be most successful in reaching men younger than 25 years – which is also the largest demographic group in the priority countries and an important group to reach before they enter the age group with the highest incidence of HIV infection.

Some provinces and countries are reaching their targets for medical male circumcision, including Kenya and the Gambella Region in Ethiopia (which have achieved over 85% of their coverage targets), while six countries have reached nearly one third of their coverage targets. Encouraging increases in uptake in 2013 were reported in Lesotho, Malawi, Uganda, the United Republic of Tanzania, Zambia and Zimbabwe. However, according to the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS), in two countries in which voluntary medical male circumcision is deemed a priority – Malawi and Namibia – coverage among adult men was less than 10% at the end of 2013. The doubling of the number of men undergoing voluntary medical male circumcision in Malawi from 2012 to 2013 suggests that uptake is nevertheless increasing in that country.

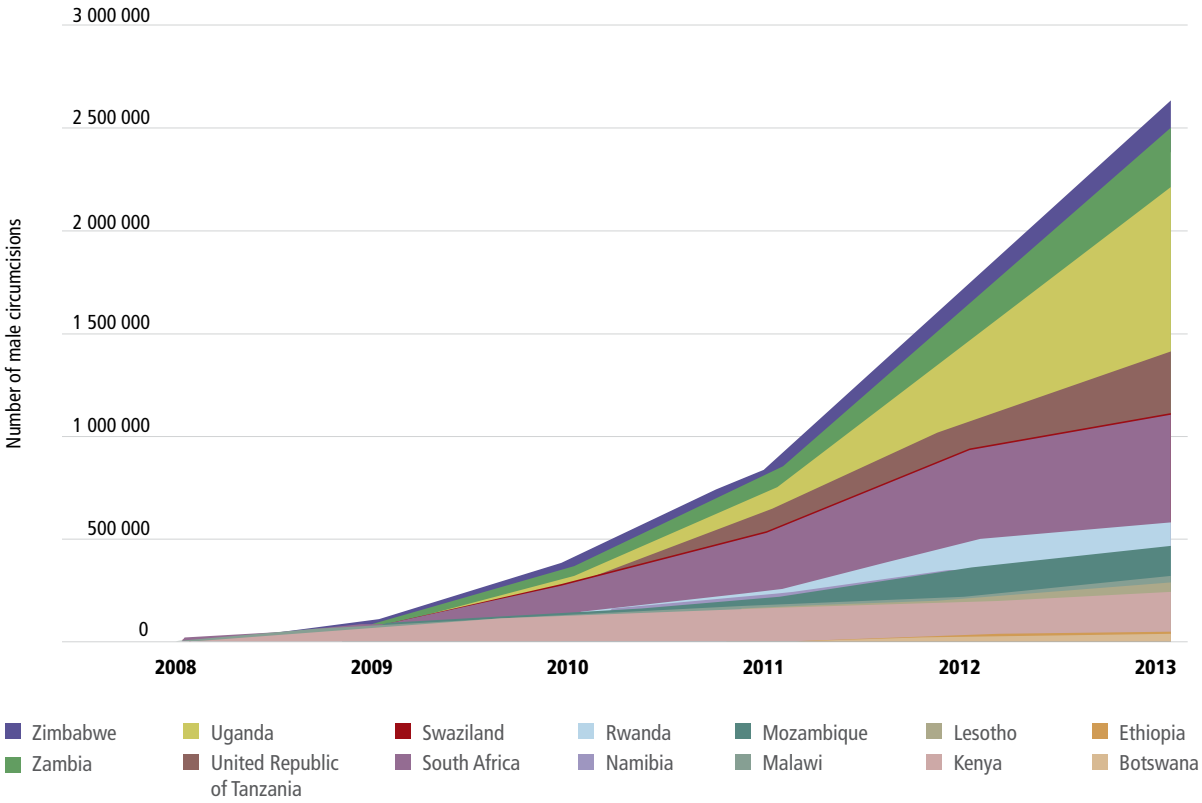
Modelling indicates that circumcising 80% of the currently uncircumcised men 15–49 years old in countries with a high HIV prevalence (and low prevalence of circumcision) could avert about one in five new HIV infections by 2025. An estimated 3.3 million people would avoid acquiring HIV infection, with cost savings of US$ 16.5 billion *(34)*. However, reaching 80% coverage to achieve that impact would entail more than 20 million males undergoing the procedure in an initial five-year catch-up phase, and maintaining that level of coverage through 2025 would require an additional 8.4 million circumcisions between 2016 and 2025. Even with the recent progress, there is still a wide gap between that target and the total number of male circumcisions performed so far in the priority countries.

If national programmes are to yield the full potential benefits of medical male circumcision, this intervention will have to be scaled up more quickly. Building on the recent momentum will require overcoming funding and human resource constraints, strengthening commitment among political and community leaders, developing and implementing innovative approaches to services and boosting local demand and avoiding stock-outs of circumcision kits and other supplies *(35)*.

Several countries are already allowing other health care workers than doctors to perform the procedure. Although a few donors ensured that most of the necessary funding for the rollout was available through 2013, funding shortfalls are anticipated from here on and will need to be filled by seeking resources from donors, including the Global Fund.

WHO has produced a framework to guide the clinical evaluation of devices for male circumcision *(36)* and has developed a programme to prequalify such devices *(37)* – important contributions to increasing the number of method options and improving the selection and procurement of safe, high-quality devices *(35)*. WHO prequalified the first such device and issued guidance

Fig. 2.1. Annual number of voluntary medical male circumcisions performed in 14 priority countries in the WHO African Region, 2008–2013



Note: The data shown for Ethiopia apply only to the Gambella Region.
Sources: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS), WHO and health ministries.

Box 2.2. Expanding medical male circumcision with new strategies and methods

While voluntary medical male circumcision services for adults in the 14 priority countries in the WHO African Region are being expanded, efforts to establish sustainable services for adolescents and/or infants to maintain high levels of coverage are also being initiated (*1*). WHO's contribution focuses on:

- advising and issuing policy, programme and service norms and standards;
- advocating for research on innovation and implementation science and assessing the efficacy and safety of methods;
- providing technical support to countries and partners, including for policy, programme and strategy reviews, quality assurance, use of new methods and monitoring;
- contributing regulatory support through the programme for prequalification of male circumcision devices;
- supporting coordination and collaboration with global and regional stakeholders to harmonize strategies and activities; and
- monitoring and reporting on progress.

on the use of devices for adult male circumcision in 2013 *(38)*. Prequalified devices offer the potential of simpler male circumcision methods that can be performed by mid-level health care workers and that may be more acceptable to men, thereby potentially further expanding service coverage and uptake. Pilot studies on the use of the prequalified PrePex device are planned, underway or completed in 13 of the 14 priority countries (Ethiopia's Gambella Region being the exception).

Strengthening linkages between adolescent and voluntary medical male circumcision services can potentially help to maintain coverage and may offer excellent opportunities to reach adolescent males with other relevant HIV prevention services (Box 2.2). As a medium-term strategy, WHO is promoting high-quality services for adolescents that address other high-priority health problems and that provide age-appropriate health promotion messages. It is also supporting UNICEF's efforts to achieve long-term, gradual integration of early infant male circumcision into maternal and neonatal health programmes. Voluntary medical male circumcision services are already integrated with the delivery of HIV testing and counselling, safer sex education, condom provision and linkage to care and treatment for men living with HIV – thereby enhancing the HIV prevention value and reaching men who generally tend to be less likely than women to access health services.

2.1.4 Controlling sexually transmitted infections remains a priority

Preventing and controlling sexually transmitted infections remain important components of a comprehensive HIV prevention strategy, with providing sexually transmitted infection services to key populations such as sex workers, men who have sex with men and transgender women among the specific priorities.

Sexually transmitted infections and key populations

The burden of sexually transmitted infections among sex workers and men who have sex with men is monitored in some countries through special studies and in others through routine service delivery data. In at least 13 of 42 countries reporting in the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) in 2013, 5% of sex workers tested positive for syphilis, as did more than 5% of men who have sex with men in 23 of 41 reporting countries. Such large burdens of disease underscore the ongoing need for sexually transmitted infection services that reach and benefit key populations. The past three years have seen strong progress on this front, supported by WHO guidance on managing sexually transmitted infections and HIV among sex workers *(40)*, men who have sex with men and transgender women who have sex with men *(41)*.

In 2013, more than 89% (132 of 140) of reporting countries were offering treatment of symptomatic sexually transmitted infections for sex workers, although screening for asymptomatic sexually transmitted infections among sex workers (in 59% of countries) and periodic presumptive treatment of sexually transmitted infections (24% of countries) were less widely available. According to the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS), sexually transmitted infection services were available to men who have sex with men in 80% (112 of 140) of reporting countries and to people who inject drugs in 82% (36 of 44) of

countries (Table 2.2). It is currently not known how many people in these groups are indeed being reached with services, nor is much known about the quality of those services.

Most countries do not collect data separately for transgender people, and very few case reporting data for sexually transmitted infections are disaggregated to provide information pertaining to them. However, the high rates of sexually transmitted infections reported in special studies indicate a need to gather such data and improve services for this key population *(42,43)*.

Legal and social barriers, including stigma and discrimination, continue to block access to high-quality sexually transmitted infection services, thus preventing their early diagnosis and treatment (see Chapters 7 and 11). For instance, fear of discrimination and threats of disclosing their sexuality to other people have been associated with reduced willingness of men who have sex with men to seek care for sexually transmitted infections in Botswana, Malawi and Namibia. In a recent study in those countries, men who have sex with men who reported having had a sexually transmitted infection were about 2.4 times as likely to report fear of seeking health care and 6 times as likely to have been denied services because of their sexual orientation. Fear and discrimination was especially high among men living with HIV who were receiving ART *(39)*.

The general population and sexually transmitted infections

In the wider population, the burdens of sexually transmitted infections are often monitored through case reporting of syndromes (usually in countries lacking extensive diagnostics for sexually transmitted infections) or causes (typically in countries where diagnostics for sexually transmitted infection are widely available in primary care settings). In 2013, genital ulcer rates were available for 52 countries and varied widely. Trend data are not available, but data from the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) for 55 countries show that urethral discharge rates are high in several countries in the WHO African Region, Western Pacific Region and South-East Asia Region. Urethral discharge is commonly caused by gonorrhoea, chlamydia or trichomoniasis infection.

Case reporting of syphilis among men and women and gonorrhoea among men are two of the most feasible causes for surveillance. Gonorrhoea among women is not monitored at the global level. However, gonorrhoea can be laboratory-confirmed among men. In 2013, 54 countries reported gonorrhoea rates for men *(44)*.

Laboratory-confirmed diagnosis of syphilis is feasible in most countries due to widely available and simple serological tests. In 2013, 50 countries provided sex-disaggregated syphilis data, and 20 countries provided data on male and female primary syphilis cases. Guided by findings and recommendations compiled in the WHO *Baseline report on global sexually transmitted infection surveillance 2012 (45)*, efforts are underway to strengthen the surveillance of sexually transmitted infections in countries and regions and globally.

Although providing effective sexually transmitted infection services for general populations is also an important component of HIV prevention efforts, data on such services are currently only available through United Nations reporting systems for syphilis among pregnant women (see Chapter 3).

Table 2.2. Provision of sexually transmitted infection services for sex workers and men who have sex with men, reported by 140 countries for 2013

	Sex workers			Men who have sex with men
Who Region	Treatment of symptomatic sexually transmitted infections	Screening for asymptomatic sexually transmitted infections	Periodic presumptive treatment for sexually transmitted infections	Management of sexually transmitted infections, including screening for symptomatic gonorrhoea, chlamydia and syphilis
African Region	93%	65%	35%	65%
Region of the Americas	100%	70%	13%	93%
Eastern Mediterranean Region	79%	29%	14%	71%
European Region	80%	57%	23%	83%
South-East Asia Region	100%	50%	30%	100%
Western Pacific Region	75%	63%	19%	81%
Global	89%	59%	24%	80%

Source: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS).

Syphilis testing during pregnancy is a valuable HIV prevention intervention for pregnant women. Initiatives for the dual elimination of mother-to-child transmission of HIV and syphilis in the Americas, Asia and the Pacific and sub-Saharan Africa recognize the role that syphilis plays in increasing mother-to-child transmission of HIV and the opportunities that exist for common solutions and interventions (see Chapter 3). In 2012, 57 low- and middle-income countries reported that a median of 81% of women attending antenatal care were tested for syphilis during their first visit. However, country-specific data highlight the need for increasing the coverage of syphilis testing among antenatal care attendees in many countries, particularly in the WHO African Region and Western Pacific Region (Fig. 2.2).

WHO will release updated global guidelines for treating sexually transmitted infections in 2015. These guidelines will address increases in multidrug resistance to *Neisseria gonorrhoeae*, improved availability of drugs for herpes simplex and *Chlamydia trachomatis* and point-of-care testing for syphilis. Countries will be able to better control sexually transmitted infections if they update their national treatment guidelines and services for sexually transmitted infections based on the new WHO recommendations.

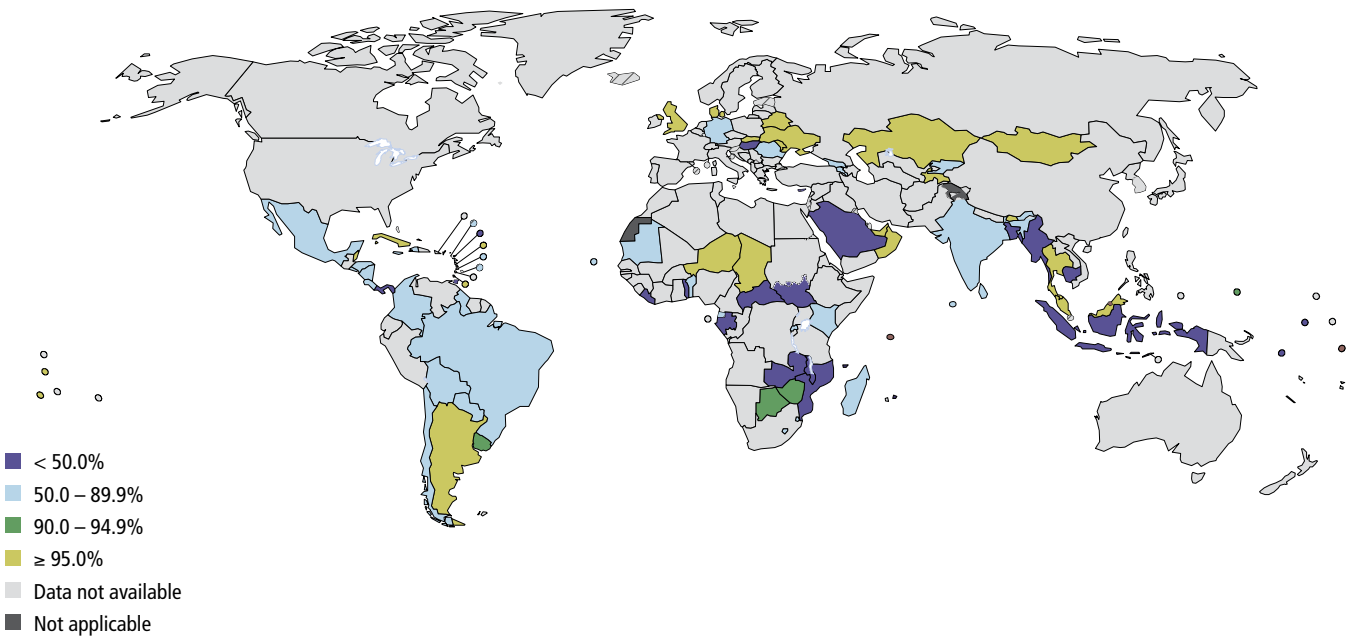
2.2 HIV prevention for serodiscordant couples can improve

Many people living with HIV are in serodiscordant couples: having partners who have not acquired HIV. The uninfected partners in serodiscordant couples face especially high risks of acquiring HIV and urgently need effective HIV prevention services.

Studies show that much HIV transmission occurs in such partnerships, especially in well-established epidemics. Mode-of-transmission analysis conducted in Kenya, Lesotho, Mozambique, Rwanda and Uganda indicates that the proportions of the people acquiring HIV infection who are within stable partnerships ranged from 10% in Kenya to 56% in Rwanda *(46)*. In the Islamic Republic of Iran, people who inject drugs and their sexual partners comprise the largest proportion of people acquiring HIV infection (68% [57–78%]) *(47)*. Modelling of HIV transmission based on survey data from 18 countries in the WHO African Region suggests that HIV within couples is largely transmitted from men to women, underlining a need for special efforts to enable women to protect themselves against HIV *(48)*.

Key prevention strategies for serodiscordant couples include: couple and partner testing (to enable individuals to be aware of their own serostatus and that of their partner); consistent condom use; and providing ART to the partner living with HIV, regardless of CD4 cell count. In addition, evidence from South Africa indicates that HIV testing and counselling can lead to rapid increases in self-reported condom use in serodiscordant couples *(49)*. Oral pre-exposure prophylaxis with ARV drugs for the HIV-negative partner is also an efficacious strategy (see below) *(50)*.

Fig. 2.2. Percentage of antenatal care attendees tested for syphilis at first visit, 2013 or latest available data



Source: Global AIDS Response Reporting (WHO/UNAIDS/UNICEF).

WHO issued policy guidance in 2012 that recommends initiating ART for the partner living with HIV irrespective of clinical or immune status *(51)*. According to the WHO HIV Country Intelligence Database, by June 2014, 28 of the 58 WHO HIV focus countries had officially adopted such a policy. Compared with earlier evaluations, this indicates that the number of national policies that recommend ART for serodiscordant couples has increased significantly in a short time *(52)*. However, the degree to which these policy shifts have materialized in significant increases in actual implementation is not known *(53)*.

2.3 Eliminating HIV transmission during health care procedures

Most HIV transmission via blood occurs among people who inject drugs. However, HIV continues to be transmitted in health care settings through the use of contaminated injection, surgical and other skin piercing equipment, transfusion of blood and blood products, tissue transplantation and accidental occupational exposure, such as needle-stick injuries.

2.3.1 Injection safety in health care settings is improving

An unknown but possibly significant number of people acquire HIV infection in health care settings through blood transfusions, health care injections, health care waste and occupational exposure. Estimates of the percentage of HIV infections that are attributable to unsafe medical injection have ranged from 0.1% to 6.9% *(54)*. However, the most recent estimations indicate that unsafe injections accounted for 0.7–1.3% of new HIV infections globally in 2010 *(55)*.

It is estimated that as many as 16 billion injections are administered annually, the vast majority of them, about 95%, as part of curative care *(56)*. Only about 3% of all injections are for immunization purposes. Worldwide, an estimated 5.5% of injections were given with syringes and needles that were reused without sterilization, according to estimates in 2010, although this proportion was much higher in some countries *(57)*. Recent research indicates that the number of potentially unsafe health care injections decreased by 88% between 2000 and 2010 in low- and middle-income countries and that progress in reducing the proportion of health care injections made with reused equipment has been remarkable. This has resulted partly from substantial efforts made by the international community, supported by the Safe Injection Global Network.

Recent estimations indicate that the absolute numbers of HIV and HCV infections transmitted through unsafe health care injections fell by 87% and 83%, respectively, during 2000–2010. Meanwhile, the impact of vaccination was evident in the estimated 91% drop in hepatitis B (HBV) infections attributable to unsafe health care injections during that same period. Unsafe health care injections were responsible for an estimated 158 000–315 000 hepatitis C (HBV) infections and an estimated 1.7 million HBV infections in 2010 *(55)*.

It is feasible to eliminate unsafe health care injections entirely from some parts of the world, thereby also removing the risk of injection-related HIV, HCV and HBV infections. Research indicates that such a goal is attainable in the WHO Region of the Americas and in the African Region if countries can shift over to syringes and needles that cannot be reused, at least for outpatient services, where most injections are administered *(57)*.

2.3.2 Blood safety is improving

Transfusion of blood and blood products is essential for treating a variety of clinical conditions, including acute blood loss, anaemia and clotting disorders. Moreover, access to sufficient, secure supplies of safe blood and blood products is important for achieving the health-related Millennium Development Goals and for universal health coverage. However, transfusing blood or blood products contaminated with HIV carries an extremely high risk of HIV transmission. Selecting suitable blood donors and testing the blood that is used for transfusions are therefore vitally important.

The implementation of safety measures has significantly reduced the risk of transmitting HIV during blood transfusion in most high-income countries. These measures include collecting blood from regular non-remunerated donors, stringent donor selection and screening blood for transfusion-transmissible infections using highly sophisticated technologies *(58)*. In the United Kingdom, for example, the risk of acquiring HIV through a blood transfusion is estimated at 1 in 6.5 million (and the risk of acquiring HBV or HCV is 1 in 1.3 million and 1 in 28 million, respectively) *(59)*. Increasing numbers of middle-income countries have introduced safeguards similar to those used in high-income countries. However, HIV infection continues to be a risk associated with blood transfusions in the parts of the world in which routine testing of all blood used for transfusions is absent, inadequate or of low quality.

Guidelines issued by WHO for achieving and maintaining a safe and reliable blood supply *(58,60)* recommend that, at a minimum, blood should be screened for HIV, HBV, HCV and syphilis. Doing so requires having a nationally coordinated blood transfusion service that relies on

voluntary, unpaid blood donations, safe transfusion practices and a quality systems check throughout the blood transfusion process. That service should be supported by a national blood policy and legislative framework, along with regular oversight to promote uniform implementation of standards and consistency in the quality and safety of blood and blood products.

Based on the latest data provided to the WHO Global Database on Blood Safety by 179 countries, about 108 million blood donations are collected worldwide annually from all types of blood donors (voluntary non-remunerated, family or replacement or paid). More than half the donations are collected in high-income countries, home to about 18% of the world's population. The median blood donation rate ranges from around 37 donations per 1000 population in high-income countries to about 12 per 1000 population in middle-income countries and only 4 per 1000 population in low-income countries.

Data from the WHO Global Database on Blood Safety indicate that 72 countries remained dependent on family or replacement and paid blood donors for more than half their blood supplies in 2012. However, blood donations from voluntary unpaid donors increased by 8.6 million between 2004 and 2012, according to data reported by 162 countries. The largest increase in voluntary unpaid blood donations was seen in the WHO South-East Asia Region (78%) and African Region (51%), and the largest rise in absolute numbers was reported in the Western Pacific Region.

Indeed, increasing numbers of countries are introducing or enhancing blood safety procedures. In 2012, 70% of countries globally had a national blood policy, compared with 60% in 2004. According to the WHO Regional Office for Africa, 43 countries in the WHO African Region had adopted national safety blood policies by the end of 2012, and all reported that their blood supply was tested for HIV (compared with 40 countries in 2009) *(11)*. Globally, however, specific legislation covering the safety and quality of blood transfusion *(61)* is still much more likely to exist in high-income countries (81%) than in middle-income (60%) and low-income (44%) countries.

The improvements made in recent years need to expand further. About 25 countries remain unable to screen all donated blood for HIV, HBV or HCV, and 24% of the blood donations in low-income countries are not screened using basic quality procedures that include documented standard operating procedures and participation in an external quality assurance scheme. The prevalence of HIV infection in blood donations in 2012 was estimated at 0.85% in low-income countries and 0.12% in middle-income countries, compared with 0.002% in high-income countries.

The WHO strategic plan on blood safety *(62)* sets out priority actions for ensuring blood safety. WHO is providing advice, technical support and tools to countries to strengthen blood transfusion services, improve the quality and coverage of blood screening, design and implement innovative strategies for recruiting and retaining voluntary non-remunerated donors and establish systems for counselling blood donors.

Shortages of voluntary blood donors and stock-outs of test kits for transfusion-transmissible infections remain common challenges. These can be overcome by increasing investment in blood transfusion services, by implementing effective strategies to motivate and recruit voluntary non-remunerated donors and by improving logistics and supply management systems.

2.4 Preventing HIV transmission from injecting drug use

One of the most efficient ways HIV is transmitted is people who inject drugs using contaminated injecting equipment. Highly effective interventions exist for preventing people who inject drugs from transmitting and acquiring HIV. Country experience has demonstrated that taking these interventions to scale can prevent, control and even reverse epidemics in these populations. Chapter 7 provides an overview of comprehensive HIV harm-reduction programmes for people who inject drugs, including interventions for HIV prevention, diagnosis, care and treatment.

Of the nine priority interventions described in the comprehensive harm reduction package for people who inject drugs, three specifically relate to prevention of HIV infection through the use of contaminated injecting equipment:

- sterile needle and syringe programmes to reduce the frequency of use of contaminated injecting equipment (needles, syringes and other injecting paraphernalia);
- opioid substitution therapy and other evidence-informed drug dependence treatment to reduce the frequency of drug injecting; and
- targeted behaviour change communication to help drug users adopt less risky injecting and other drug use behaviour.

In addition, the harm-reduction package includes interventions that aim to reduce the risk of sexual transmission of HIV among people who inject drugs, including condom programming, the prevention and treatment of sexually transmitted infections and the use of ARV drugs (including ART and post-exposure prophylaxis). Chapter 7 describes the overall package and the specific interventions in more detail.

Sterile needle and syringe programmes have a key role in all settings where injecting drug use occurs. Providing sterile injecting equipment free of charge or at low cost, including needles, syringes and other injecting paraphernalia, reduces the risk of acquiring and transmitting HIV and has been shown to prevent and control HIV epidemics among people who inject drugs *(63)*. Needle and syringe programmes also play a key role in reducing the transmission of other bloodborne viruses, such as HBV and HCV, among people who inject drugs *(64)*.

The specific needs and preferences for injecting equipment among people who inject drugs vary between communities and depend on the substances that are most commonly used. The injecting equipment used by people who inject drugs may be different to the equipment commonly available for health care purposes. For example, WHO recommends that needle and syringe programmes for people who use drugs supply low-dead-space syringes,[2] along with information about their preventive advantage over conventional syringes, to reduce HIV risk through syringe reuse. In addition, WHO is promoting the use of single-use injecting devices in health-care settings *(66)*. Injection safety and harm-reduction programmes therefore need to be coordinated to ensure that policies, procurement practices and distribution and disposal approaches for needles and syringes are aligned well.

2.5 Making full use of the preventive impact of ARV drugs

2.5.1 Maximizing the prevention benefits of ART

ARV drugs offer a powerful addition to current combination HIV prevention strategies and approaches, including maximizing the prevention benefits of ART, post-exposure prophylaxis and pre-exposure prophylaxis.

Providing ART to people living with HIV is aimed at improving their health while also reducing the risk of HIV transmission to others. This is the rationale for using ART in serodiscordant couples and for considering earlier initiation of ART in some populations and settings. Evidence from trials indicates that ART can reduce the risk of transmitting HIV by as much as 96% *(67,68),* although the protective effect appears to be smaller in operational settings: for example, an estimated 66% reduction in HIV incidence among a cohort of HIV-discordant couples in China *(69)*.

The trial findings have been confirmed by some longitudinal studies, including in a rural part of South Africa, where the incidence of HIV infection fell by 17% for every 10% increase in the number of people receiving ART *(68)*. A 2011 modelling study estimated that a combination of classical HIV prevention interventions and ART coverage of 80% (based on the 2010 WHO guidelines) *(70)* could reduce the number of people acquiring HIV infection globally from more than 3 million per year to 1.2 million by 2025 *(71)*. Modelling in Viet Nam suggests that a combination prevention strategy centred on expanded HIV testing and early ART for key populations could virtually eliminate HIV transmission in that country by 2025. This would entail a series of significant achievements. The vast majority of people in key populations would need to take an HIV test (70% of people who inject drugs and men who have sex with men and 80% of female sex workers), and 95% of those who test HIV-positive would have to start ART, be retained in care and achieve viral suppression *(72)*.[3]

However, findings from other studies suggest that the early expectations attached to the treatment as prevention[4] approach may need to be tempered and reinforce the need to position ART within a combination prevention approach *(73–75)*. The challenge now is to realize this enormous potential in real-world settings.

The impact of ART on HIV transmission would be greatest if treatment is initiated early during the course of infection, if strong adherence to treatment and viral suppression is achieved and if ART is combined with other proven behavioural, biomedical and structural prevention approaches such as condom use, harm reduction and voluntary medical male circumcision. The evidence has prompted increasing interest in maximizing the HIV prevention benefits of ART, and informed WHO's 2012 guidance recommending that HIV-positive partners in serodiscordant couples start ART, irrespective of their clinical or immune status *(51)* and the 2013 WHO consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection *(76)*.

According to the WHO HIV Country Intelligence database, by April 2014, 28 of 58 focus countries had adopted providing ART for serodiscordant couples in their treatment guidelines.

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[2] "Low dead-space" refers to the space within the needle and between the syringe hub and the plunger where fluid can remain after injecting has occurred. Modelling indicates that injection-related HIV epidemics could be averted if 95% or more of the people who inject drugs used low-dead-space syringes *(65)*.

[3] The model also assumes scaling up methadone maintenance therapy (to reach 50% of the people who inject drugs) and consistent condom use (85% for female sex workers and 60% for men who have sex with men) as well as maintaining current high levels of access to clean syringes.

[4] "Treatment as prevention" refers to HIV prevention methods in which people living with HIV use ART, independent of CD4 cell count, to decrease the risk of onward HIV transmission.

Some countries, such as France and the United States of America, are offering ART to everyone living with HIV regardless of their CD4 count, and others are applying a similar approach to specific groups, such as key populations. For example, the United Republic of Tanzania is implementing a policy in Zanzibar of providing ART to people living with HIV belonging to key populations regardless of their CD cell count and it is piloting a similar approach on the mainland. Indonesia has adopted a similar policy in western Java among people who inject drugs, and Rwanda has plans to start providing ART to HIV-positive sex workers and men who have sex with men regardless of CD4 count in 2014. China is piloting the approach in 12 cities among men who have sex with men who have acquired HIV, and Viet Nam is piloting it for people who inject drugs who are living with HIV.

These new HIV treatment policies are important innovations that offer potentially major clinical benefits and promise to reduce HIV transmission, engage marginalized and key populations in care and simplify the delivery of certain HIV services. WHO is closely monitoring these country experiences and new evidence, such as from the Strategic Timing of Antiretroviral Treatment (START) Study, to inform future updates to the ARV guidelines.

2.5.2 The use of pre-exposure prophylaxis holds great promise …

Among the promising new options is the use of oral or topical ARV drugs, daily or intermittently, by HIV-uninfected people who are at high risk of becoming infected, to block the acquisition of HIV infection. Several trials of the effectiveness of oral pre-exposure prophylaxis have yielded promising results. Long-acting options, using injectable or topical ARV preparations, are also being assessed.

Pre-exposure prophylaxis taken daily as oral tablets to create systemic protection has been found to be effective among men who have sex with men (in the Pre-Exposure Prophylaxis Initiative, iPrEx) *(77)*, serodiscordant couples (Partners' PrEP Study) *(78)*, sexually active young adults (TDF2) *(79)* and injecting drug users (the Bangkok Tenofovir Study) *(80)*. However, less favourable findings emerged from the Fem-PrEP trial *(81)* and the Vaginal and Oral Interventions to Control the Epidemic (VOICE) tenofovir arm *(82)*. Although divergent, the findings suggest that pre-exposure prophylaxis may have a potentially important supplementary role as part of a combination prevention package and that strong adherence is a crucially important factor *(83)*. Pre-exposure ARV prophylaxis can cut HIV transmission by more than 40% among men who have sex with men *(77)* and by as much as 49% among people who inject drugs *(80)*.

Based on this evidence, WHO in 2012 published guidance on oral pre-exposure prophylaxis for serodiscordant couples as well as for men and transgender women who have sex with men *(50)*, recommending that this intervention be considered as a possible additional prevention choice, while supporting demonstration projects in a limited number of countries to examine critical implementation issues. With continuing high rates of HIV incidence reported among men who have sex with men in all regions despite the availability of current prevention interventions, an updated, strengthened recommendation *(20)* was made to provide pre-exposure prophylaxis as an additional HIV prevention choice within a comprehensive HIV prevention package.

The United States of America has included pre-exposure prophylaxis in its HIV prevention portfolio, and demonstration projects are underway in several other countries.

Other modalities, such as pre-exposure prophylaxis on demand, are being explored to address the possibility that continuous daily pre-exposure prophylaxis may not be appropriate for all populations. Modelling analysis suggests that using pre-exposure prophylaxis alongside expanded early ART for people living with HIV and other prevention methods (including medical male circumcision) could dramatically reduce the incidence of HIV infection if high coverage levels can be achieved *(84)*.

Recent studies in southern Africa on the cost–effectiveness of pre-exposure prophylaxis suggest that topical pre-exposure prophylaxis, in particular, could have a significant, positive effect but that the possible opportunity costs for potentially more cost-effective prevention strategies need to be considered. In addition, studies in concentrated epidemics in the United States of America and Peru have highlighted concerns about the barriers high drug costs pose to a wide rollout of pre-exposure prophylaxis. All the studies emphasized the importance of adherence for programme effectiveness *(85)*.

WHO's guidance on the use of this approach has therefore remained cautious. For key populations, including sex workers and men who have sex with men, WHO advises that daily oral pre-exposure prophylaxis (specifically the combination of tenofovir and emtricitabine) may be considered, but in combination with the consistent use of condoms as well as frequent HIV testing and counselling and treatment of sexually transmitted infections. WHO has not yet issued recommendations on using pre-exposure prophylaxis among people who inject drugs.

Specific concerns need to be addressed before pre-exposure prophylaxis is adopted more widely. Pre-exposure prophylaxis should complement rather than replace existing, effective prevention interventions within a rights-based approach (such as condom programming and needle and syringe programmes and opioid substitution therapy for people who inject drugs). The approach also should not be expanded at the expense of providing adequate ART coverage for people with HIV. Further, strict adherence to pre-

exposure prophylaxis regimens – a prerequisite for the successful use of ARV drugs in general – must be achieved. WHO is encouraging countries to consider pre-exposure prophylaxis as an additional prevention intervention in specific populations and contexts and to undertake demonstration projects to explore the critical implementation issues *(20,50)*.

2.5.3 … and post-exposure prophylaxis remains an important intervention

The potential importance of post-exposure prophylaxis as a prevention intervention based on ARV drugs has been widely recognized for some time *(86)*. Post-exposure prophylaxis can reduce the risk of developing HIV infection in an individual who has been exposed to HIV and is therefore widely regarded as an integral part of HIV prevention strategies overall. In particular, post-exposure prophylaxis can be used effectively for non-occupational exposure, including following sexual assault, the sharing of drug-injecting equipment and potential exposure through consensual sex.

The prescription of post-exposure prophylaxis and the regimens being used are far from uniform currently. Guidelines vary, with different regimens being recommended, including combinations of two drugs or more and of different drug classes. The frequency at which post-exposure prophylaxis may be offered with repeat exposure to HIV also varies, as does the types of health care setting that provide post-exposure prophylaxis. As a complementary strategy, some countries are considering offering pre-exposure prophylaxis – in which ARV drugs are used to prevent people from acquiring HIV before exposure – to people who have frequent repeat courses of post-exposure prophylaxis for non-occupational exposure to HIV.

Inadequate uptake of and adherence to post-exposure prophylaxis is a concern, however. A systematic evidence review conducted in support of the WHO guideline process found that only 60% of people considered eligible for post-exposure prophylaxis completed the entire 28-day course. Completion rates were highest for non-occupational exposure (65%) and lowest for victims of sexual assault (40%). Higher rates of completing post-exposure prophylaxis were reported among men who have sex with men (68%). Simplified prescribing of post-exposure prophylaxis is expected to improve completion rates. WHO's new guidelines on post-exposure prophylaxis, which focus on recommended post-exposure prophylaxis regimens and duration of the course, will be issued in 2014.

2.6 Further innovations in HIV prevention are being sought

Highly promising tools have been added to the combination prevention inventory, including voluntary medical male circumcision, pre-exposure prophylaxis and early initiation of ART. More efficient and effective models for delivering prevention interventions are being devised and implemented, with community systems playing a key role and communication technologies offering new opportunities to reach those populations that are most vulnerable, at risk and marginalized.

These prevention advances have spurred further innovations in HIV prevention research. Improved male and female condoms are being developed and promoted. Safer injecting equipment, such as low-dead-space syringes *(65)*, can reduce the risk of HIV transmission among people who inject drugs and aim to improve the impact of harm-reduction programmes. Developing long-acting, injectable ARV drugs, meanwhile, could potentially overcome adherence challenges for HIV prevention and treatment.

Meanwhile, ongoing investment in developing effective preventive HIV vaccines remains a central pillar of HIV prevention research. Recent advances in HIV basic science, vaccine and treatment research have stimulated renewed interest in the possibility of a cure for HIV infection. Most attention is being focused on research to develop a functional cure that would result in permanent suppression of HIV replication without eliminating the virus from the body. A global initiative has been launched to devise a research strategy that can take this agenda forward (*87*) and is contributing to the HIV cure agenda.

2.6.1 The quest for an effective HIV vaccine continues

Despite the recent successes in reducing the number of people acquiring HIV infection – and the prospects of extending these gains – an effective and safe HIV vaccine remains a global public health priority and the best hope for eventually ending the AIDS epidemic.

Modelling by the International AIDS Vaccine Initiative and its partners has indicated that a vaccine could prevent an additional 19.4 million cumulative people from becoming infected and an additional 3.7 million people from dying from AIDS-related causes by 2050, even if ART coverage reaches only 50% of recommended levels and coverage with other existing prevention interventions reaches only 50% of the targets by 2020 *(88)*.

More than 30 HIV vaccine clinical trials, testing a variety of candidates and vaccine concepts, are currently underway. Most are early-stage trials (Phases I and II)

testing the safety of various candidates and their ability to provoke immune responses. Funding for vaccine research has come primarily from governments, which in 2012 footed 83% of the bill, with the private sector (mostly pharmaceutical) contributing 3% and the philanthropic sector 13% of the total *(88)*.

Numerous HIV vaccine concepts have been developed and tested clinically since 1986, yet only four have completed efficacy trials, and only one of these, termed RV-144, provided evidence for protection against HIV. Conducted from 2003 to 2009 among 16 000 volunteers in Thailand and using two types of vaccine given consecutively (heterologous prime-boost regimen), the community-based RV-144 efficacy trial demonstrated for the first time that vaccine could prevent people from acquiring HIV infection. Efficacy was modest, however, at 31%. In 2013, another prime-boost regimen (HVTN505, sponsored by the United States National Institute of Allergy and Infectious Diseases) failed to prevent or control HIV infection.

Current efforts in developing HIV vaccines include building on the RV-144 efficacy trial results and developing candidate vaccines that elicit broad and long-lived protection against HIV. Plans are underway to test a RV-144-like vaccination regimen in South Africa, using additional booster immunizations aimed at extending the durability of protection, with the intention of increasing the level of protection. If vaccine efficacy of >50% is demonstrated, the vaccine could become available in South Africa as early as 2021. The Pox-Protein Public Private Partnership, comprising philanthropic as well as public- and private-sector partners, is coordinating the planning of the next set of efficacy trials, which potentially would include a trial of a RV-144-like vaccine regimen in a higher-risk population of men who have sex with men in Thailand.

Other vaccine development efforts are seeking to address the hypervariability of HIV. One vaccine candidate focuses on conserved regions of the HIV genome; another concentrates on mosaic antigens that are genetically modified to represent gene segments from as many HIV strains as possible in a vaccine. Other research focuses on using replicating viral vaccine vectors, such as cytomegalovirus, that are genetically modified to express proteins from simian immunodeficiency virus, which in animal challenge studies has been shown to control this monkey equivalent of HIV to undetectable levels in about 50% of macaques immunized with simian immunodeficiency virus vaccines.

There has been significant progress in strategies to elicit broadly neutralizing antibodies that can block the acquisition of HIV infection. These antibodies are rare and evolve very slowly during natural infection. However, promising vaccination strategies have been developed, including sequential vaccination with various vaccine antigens that can speed up the induction of these elusive antibodies. Moreover, human trials have been initiated evaluating the capacity of broadly neutralizing antibodies (or, more specifically, genes encoding them) to act as therapeutic agents in what is referred to as passive immunization.

Despite the formidable challenges, the outlook is promising for continued advances in HIV vaccine development during the next few years (Box 2.3). The RV-144 regimen has shown preventing the acquisition of HIV infection in humans is possible. Recent observations that simian immunodeficiency virus vaccines can elicit immune responses that control and, in some cases, even clear simian immunodeficiency virus infection have raised the prospect for comparable HIV vaccines. A small percentage of the people living with HIV (called "elite neutralizers") develop broad and potent neutralizing antibodies against HIV, which demonstrates that eliciting such neutralizing antibody responses by immunization should be possible. In addition, a small percentage of the people living with HIV (known as "elite controllers") are capable of controlling HIV infection without ARV drugs. This appears to be associated with components of the adaptive immune system, which suggests that vaccination could control HIV infection.

Box 2.3. Why do we not yet have an HIV vaccine?

Despite global commitment and years of intensive research, an effective HIV vaccine has yet to be achieved. The difficulty stems especially from the variability and resilience of HIV. As a retrovirus, HIV integrates into the host genome, leaving a very brief window of opportunity for immune intervention. After that, HIV typically overpowers the capacity of humans' natural immunity to rid itself of the virus, with the implication that an effective HIV vaccine will probably need to perform "better than nature". Achieving such a vaccine is proving very complicated, especially because of the difficulty of inducing durable immune protection in the mucosa, the main entry site for HIV into the host, and because the prime target of HIV – the body's $CD4^+$ T cells – is normally tasked with orchestrating vaccine-induced immune responses. Add to this the remarkable degrees of genetic variability displayed by HIV and it becomes clearer why an effective HIV vaccine is proving so elusive. Nevertheless, recent research has yielded strong, new grounds for optimism, especially the breakthrough discovery made during the RV-144 HIV vaccine trial in Thailand that preventing HIV infection with a vaccine is indeed possible.

Chapter 3. ELIMINATING NEW HIV INFECTIONS AMONG CHILDREN

Key Messages

Too many children are still being newly infected with HIV

The move to provide ART for all pregnant women living with HIV is invigorating efforts to eliminate mother-to-child transmission of HIV. In 2013 more pregnant women living with HIV were tested and started on ARV drugs to prevent mother-to-child transmission and for their own health, and new infections in children declined further. But efforts need to accelerate considerably to reach the Global Plan targets.

- Close to one million pregnant women with HIV received ARV drugs for PMTCT of HIV in 2013, representing two thirds (67%, range 62%–73%) of all pregnant women with HIV – an increase in coverage of over 40% since 2009 – up from 47% in 2009 and 56% in 2011.
- ART has become the standard for pregnant women living with HIV, and all 22 priority countries of the Global Plan now have guidelines officially endorsing Option B or B+, in accordance with the 2013 WHO consolidated ARV guidelines.
- In the most severely affected subregion – eastern and southern Africa – almost three in four (74%) pregnant women were tested for HIV in 2013 and know the result. However, because testing rates are lower in some regions and in large population countries with low prevalence, the estimated overall HIV testing rate in low- and middle-income countries was only 44% in 2013.
- The estimated number of children acquiring HIV infection in low- and middle- income countries fell by 40% from about 400 000 in 2009 to 240 000 in 2013. But the pace of this progress will need to accelerate to meet the Global Plan target for 2015 (less than 40 000 new infections in children).
- Elimination of mother-to-child transmission of HIV may soon be validated in some countries in which the number of children newly infected with HIV is at a very low level.
- Early infant diagnosis was performed in less than half of HIV-exposed infants, and this low level is one of the major reasons for the low ART coverage among infants generally.

Implementation of the Global Plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive *(1)* since 2011 has added powerful impetus to efforts to reduce the mother-to-child transmission of HIV, especially in low- and middle-income countries with a high prevalence of HIV infection.[1]

In 2013, an estimated 240 000 [210 000–280 000] children were newly infected with HIV in low- and middle-income countries overall, about 160 000 fewer than the estimated 400 000 [370 000–450 000] who acquired HIV infection in 2009. This represents a 40% decline in the number of children newly infected since 2009, the baseline year for the Global Plan. Progress continued in 2013 but will need to accelerate to meet the ambitious Global Plan targets for 2015 (which include reducing new HIV infections in children to less than 40 000).

Globally, there were still more than 1.4 million [1.3 million – 1.6 million] pregnant women with HIV in 2013 (all of whom needed interventions for PMTCT of HIV) in low- and middle-income countries, of whom and estimated 67% [62%–73%] received ARV drugs for preventing mother-to-child transmission (PMTCT) of HIV. The number of pregnant women with HIV has remained relatively stable since 2009, but the proportion receiving recommended ARV regimens for PMTCT of HIV has increased steadily, as has the proportion receiving more effective regimens. The estimated overall rate of mother-to-child transmission of HIV in 2013 declined to about 17% [14–19%] in low- and middle-income countries overall, an impressive drop from 26% [23–29%] in 2009.

The 22 priority countries selected for the Global Plan accounted for about 90% of the estimated global number of children newly infected with HIV in 2009. Twenty-one of the 22 countries (all except India) are in the WHO African Region, and progress in these priority countries strongly shapes global trends for PMTCT of HIV. Significant progress has been made in these countries during 2009–2013,

[1] The 22 priority countries in the Global Plan are Angola, Botswana, Burundi, Cameroon, Chad, Côte d'Ivoire, Democratic Republic of the Congo, Ethiopia, Ghana, India, Kenya, Lesotho, Malawi, Mozambique, Namibia, Nigeria, South Africa, Swaziland, Uganda, United Republic of Tanzania, Zambia and Zimbabwe.

with rising numbers of pregnant women knowing their HIV status and receiving increasingly effective regimens, and growing numbers of HIV-exposed infants receiving a virological test in the first two months of life. In the 21 Global Plan countries in the African Region, the estimated mother-to-child transmission rate decreased from about 26% [23–28%] in 2009 to 16% [13–18%] in 2013, and the corresponding number of children newly infected with HIV fell from an estimated 350 000 [310 000–380 000] in 2009 to 200 000 [170 000–230 000] in 2013.

Although encouraging, the recent progress still leaves many countries well short of the goal of reducing the number of children newly infected with HIV by 90% in 2015 compared with the 2009 baseline. It also leaves them short of achieving country-level mother-to-child transmission rates lower than 5% or less than 2% in non-breastfeeding settings. Both the reduction in the number of children newly infected with HIV and the reduction in the transmission rate are key targets of the Global Plan *(2)*.

Achieving these targets will entail significantly scaling up coverage of the most effective ARV interventions for PMTCT of HIV (options B and B+) for the required duration, as recommended in the WHO 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection *(3)* (Box 3.1). It will also require additional prevention strategies to reduce the number of pregnant women living with HIV, including primary HIV prevention for women (for reducing the number of women acquiring HIV infection) and access to contraception and other family planning services (reducing unintended pregnancies, including among women living with HIV).

Box 3.1. The 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection and PMTCT of HIV

The WHO 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection *(3)* include important recommendations for simplifying and further scaling up HIV interventions among pregnant and breastfeeding women living with HIV, their HIV-exposed infants and children living with HIV, including the following.

- ART should be offered to all pregnant and breastfeeding women living with HIV, regardless of CD4 count, and ART for pregnant and breastfeeding women should be simplified by using a standardized one-pill-daily, fixed-dose combination of three ARV drugs (TDF + 3TC (or FTC) + EFV), which is the same as for first-line general adult treatment.

- ARV drug regimens for adults living with HIV and for pregnant and breastfeeding women living with HIV should be harmonized. Previous WHO ARV guidelines recommended different adult ARV regimens for PMTCT of HIV and for treatment. The 2013 consolidated guidelines recommend the same, fixed-dose, single-pill, triple-drug regimen for all adults and adolescents, including for pregnant women, as first-line therapy. This will simplify the forecasting, supply and delivery of ART and enable pregnant women living with HIV to continue on the same drug regimen for their own health.

- ART delivery should be expanded in antenatal, maternal and child health settings. The 2013 consolidated guidelines recommend that, in many settings, including generalized epidemics, lifelong ART (option B+) be initiated and maintained for all pregnant and postpartum women and infants and for all children younger than five years in maternal, newborn and child health care settings, with linkage and referral to ongoing HIV care and ART clinics where appropriate. In some settings, ART is to be provided to all pregnant women living with HIV throughout the duration of the mother-to-child transmission risk period (until the end of breastfeeding) and then should be continued lifelong in women who meet other treatment eligibility criteria (for example, CD4 cell counts <500 cells/mm^3, option B). Expansion of nurse-initiated ART, decentralization and integration will facilitate access to effective ARV interventions in maternal, newborn and child health services.

- Existing systems need to be strengthened and new technologies should be incorporated to expand infant testing. In addition to further scale-up of dried blood spot polymerase chain reaction testing in central laboratories, point-of-care virological tests, which are expected to become available in late 2014, should help the early identification of HIV-infected infants and promote more rapid linkage to treatment and care. Final diagnosis of infants in settings for PMTCT of HIV, and broader provision of provider-initiated testing and counselling outside settings for PMTCT of HIV to identify HIV-exposed or -infected infants who are not being followed up for PMTCT of HIV, should also continue to be emphasized.

- Immediate, lifelong ART is recommended for all children living with HIV younger than five years of age, regardless of CD4 count. This should facilitate more rapid access to treatment for children diagnosed with HIV infection.

The key improvement needed to achieve low HIV transmission rates from mother to child is to identify the maximum number of pregnant women living with HIV, reach them with highly effective ARV drugs and assure that they take those drugs during the risk period.[2]

There has been a rapid shift in all regions and in many countries to the 2013 recommendations for PMTCT of HIV on initiating ART for all pregnant and breastfeeding women diagnosed with HIV, regardless of their clinical or immune status (option B or B+). By June 2014, almost half the 58 WHO focus countries had followed Malawi's early lead by adopting option B+, a move that is expected to further reduce the rates of mother-to-child HIV transmission, protect the health of greater numbers of mothers living with HIV and provide additional prevention benefit against the sexual transmission of HIV.

The rapid transition to more-effective ARV regimens in countries with the highest burden of HIV is evident in Table 3.1, which shows that all 22 Global Plan countries have now adopted either option B or B+, and two thirds of these countries are implementing option B+. The table shows the implementation phases, from early implementation to scale-up and eventually national coverage. Four countries have reported achieving national coverage with option B+ (Ethiopia, Lesotho, Malawi and Uganda). Implementing and scaling up options B and B+ involve a process that requires intensive efforts and planning, including adequate training of health workers, adjusting drug forecasting and procurement, introducing new services to peripheral sites and ensuring that PMTCT and ART programmes are integrated.

Table 3.1. ARV regimen policies for PMTCT of HIV among pregnant women living with HIV in the 22 Global Plan priority countries, as of June 2014

Country	Policy on regimens for PMTCT of HIV after WHO 2010 ARV guidelines[a]	Health ministry guideline policy on PMTCT of HIV, as of June 2014[a]	Implementation status of option B+ as of June 2014[b]	Implementation of option B[c]
Angola	B	B+ (2013)	Scale-up	
Botswana	B	B (2011)	...	National
Burundi	B	B (2010)	...	National
Cameroon	A	B+ (2012)	Planning, pilots and early implementation	
Chad	B	B (2010)	...	National
Côte d'Ivoire	B	B		National
Democratic Republic of the Congo	A	B+ (2013)	Planning, pilots and early implementation	
Ethiopia	A	B+ (2013)	National	
Ghana	A	B	...	National
India	A	B+ (2014)	Scale-up	
Kenya	A	B+ (2014)	Planning, pilots and early implementation	
Lesotho	A	B+ (2013)	National	
Malawi	B+	B+ (2011)	National	
Mozambique	A	B+ (2013)	Scale-up	

[2] The Global Plan includes three targets for ARV prophylaxis and therapy: 90% of pregnant women living with HIV receive perinatal ART or prophylaxis; 90% of pregnant women living with HIV eligible for ART for their own health receive lifelong ART; and 90% of breastfeeding mother–infant pairs (either mother or baby) receive ART or prophylaxis.

Country	Policy on regimens for PMTCT of HIV after WHO 2010 ARV guidelines[a]	Health ministry guideline policy on PMTCT of HIV, as of June 2014[a]	Implementation status of option B+ as of June 2014[b]	Implementation of option B[c]
Namibia	A	B+ (2014)	Planning, pilots and early implementation	
Nigeria	A/B	B (2014)	...	National
South Africa	A	B (2013) (option B+ in the Western Cape Province)	...	National
Swaziland	A	B+ (2014) (new guidelines with option B+ due for mid-2014 release)	Planning, pilots and early implementation	
Uganda	A	B+ (2013)	National	
United Republic of Tanzania	A	B+ (2013)	Scale-up	
Zambia	A	B+ (2013)	Planning, pilots and early implementation	
Zimbabwe	A	B+ (2013)	Scale-up	

The guideline policy is based on a formal health ministry circular or a full guideline outlining the national policy. The implementation status of option B+ (once the policy has been adopted) is categorized as follows.

[a] **Planning, pilots and early implementation:** option B+ operational plans and training in development, piloting at select sites and early implementation.
[b] **Scale-up:** operational plans and training in place, option B+ programme scaling up to multiple regions and facilities (including final phase of scale-up, which is a transition to the national level), some sites still providing option A or option B services.
[c] **National:** option B+ policy implemented at all sites for PMTCT of HIV or for maternal, newborn and child health. ART can be provided on site (preferred) or through referral at some facilities, according to the service delivery models in the country.
... Not applicable

3.1 Reducing HIV transmission from mother to child

About 89% of the estimated 240 000 children who were newly infected with HIV in 2013 were in the WHO Africa region, 8% were in the WHO South-East Asia Region, 1% in the WHO Eastern Mediterranean Region and in the WHO Region of the Americas, and less than 1% in the WHO European and Western Pacific Regions.

Nearly all young children newly infected with HIV are infected through mother-to-child transmission. Countries that have expanded their programmes for PMTCT of HIV can expect final mother-to-child transmission rates to decrease from around 25–40% (assuming no interventions) to less than 2% (in the absence of breastfeeding) or less than 5% (with very high coverage of effective ARV drugs), depending on the duration of breastfeeding among HIV-exposed infants.

Rapidly expanding services for PMTCT of HIV and the wider use of more efficacious regimens have led to a substantial decline in overall mother-to-child transmission rates and the annual number of children newly infected with HIV in low- and middle-income countries.[3] The estimated overall rate of mother-to-child transmission of HIV in 2013 declined to about 17% [14–19%] in low- and middle-income countries overall, an impressive drop from 26% [23–29%] in 2009. This trend mirrors the progress seen in the 21 Global Plan countries in the African Region (see Table 3.1)

Some of the 22 Global Plan priority countries are approaching the low HIV transmission rates among children that have been achieved in high-income countries. Botswana, South Africa and Swaziland have demonstrated consistently high coverage of effective

[3] To ensure that limited resources are allocated for the most impact, WHO has identified 58 focus countries for its HIV programme activities in 2014–2015. These include the 38 high-impact countries identified by UNAIDS, the 22 Global Plan countries and other countries identified by WHO regional offices as having strategic importance. Additional countries will be supported depending on needs and available resources. The 2014–2015 focus countries are: Angola, Bolivia, Botswana, Brazil, Burundi, Cambodia, Cameroon, Central African Republic, Chad, China, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Dominican Republic, Ecuador, El Salvador, Ethiopia, Ghana, Guatemala, Haiti, Honduras, India, Indonesia, Islamic Republic of Iran, Jamaica, Kazakhstan, Kenya, Kyrgyzstan, Lesotho, Libya, Malawi, Morocco, Mozambique, Myanmar, Namibia, Nepal, Nigeria, Pakistan, Papua New Guinea, Paraguay, Philippines, Russian Federation, Rwanda, Somalia, South Africa, South Sudan, Sudan, Swaziland, Tajikistan, Thailand, Uganda, Ukraine, United Republic of Tanzania, Uzbekistan, Viet Nam, Yemen, Zambia and Zimbabwe.

Table 3.2. Overview of the impact of services for PMTCT of HIV in the 21 Global Plan priority countries in the WHO African Region, 2005–2013

Year	Estimated number of pregnant women living with HIV [range]	Estimated mother-to-child transmission rate of HIV [range]	Estimated number of children newly infected with HIV [range]	Estimated cumulative number of infections averted by PMTCT [range][a]
2005	1 410 000 [1 320 000–1 520 000]	33% [31–36%]	470 000 [430 000–510 000]	41 000
2006	1 390 000 [1 290 000–1 490 000]	32% [30–35%]	450 000 [420 000–490 000]	73 000
2007	1 370 000 [1 270 000–1 470 000]	31% [29–33%]	420 000 [390 000–460 000]	130 000
2008	1 360 000 [1 260 000–1 450 000]	29% [27–31%]	400 000 [360 000–430 000]	200 000
2009[b]	1 340 000 [1 250 000–1 430 000]	26% [24–28%]	350 000 [310 000–380 000]	320 000
2010	1 330 000 [1 230 000–1 420 000]	23% [21–25%]	300 000 [280 000–330 000]	480 000
2011	1 310 000 [1 210 000–1 400 000]	21% [20–23%]	280 000 [250 000–300 000]	660 000
2012	1 290 000 [1 190 000–1 380 000]	17% [16–19%]	220 000 [200 000–250 000]	880 000
2013	1 260 000 [1 170 000–1 360 000]	16% [15–17%]	200 000 [170 000–230 000]	1 120 000

Sources: UNAIDS/WHO estimates.

[a] Compared with the counterfactual scenario where no ARVs are provided for mother-to-child transmission.
[b] Baseline year for the Global Plan.

Box 3.2. Main criteria for validating the elimination of mother-to-child transmission of HIV and syphilis

The Global Plan focuses on specific policy and programmatic measures that can ensure rapid progress towards eliminating new HIV infections among children by 2015. Ten Global Plan targets were set as milestones for tracking progress towards eliminating mother-to-child HIV transmission at the global level, including a 90% reduction in the number of children acquiring HIV infection and reducing vertical transmission rates of HIV to less than 5% in breastfeeding population or less than 2% in non-breastfeeding populations.

As countries advance towards the Global Plan targets, they will increasingly approach the elimination of HIV among children as a major public health concern. Validating the elimination of mother-to-child transmission of HIV then becomes a critical step for countries.

Since no internationally standardized processes and criteria existed to validate the actual elimination of mother-to-child transmission of HIV and syphilis, WHO together with UNICEF, UNAIDS and other partners has developed a set of global criteria and processes, which are outlined in the *Global guidance on criteria and processes for validation: elimination of mother-to-child transmission of HIV and syphilis (6).*

The elimination impact targets for validation are:

- for HIV, fewer than 50 infants acquiring HIV infection per 100 000 live births and a transmission rate of either less than 5% in breastfeeding populations or less than 2% in non-breastfeeding populations; and
- for syphilis, fewer than 50 cases of congenital syphilis per 100 000 live births.

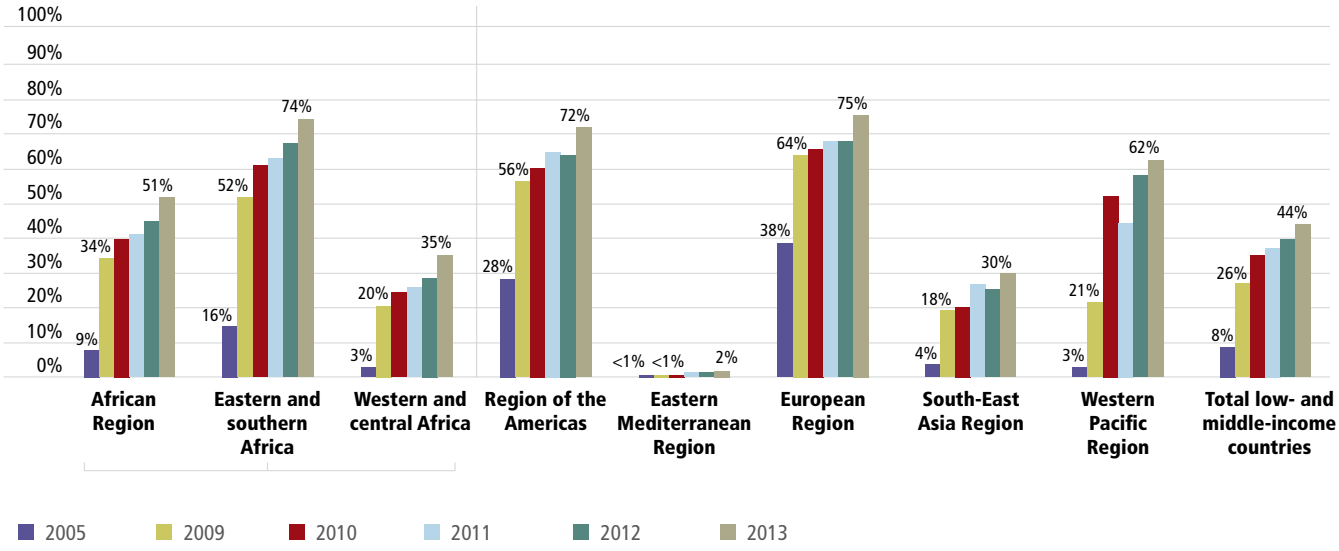
Specific levels of service delivery coverage indicators also need to be met to validate the elimination of mother-to-child transmission of HIV and syphilis, and four process targets have been proposed for validation:

- antenatal care coverage (at least one visit) of at least 95%;
- coverage of HIV and/or syphilis testing of pregnant women of at least 95%;
- ART coverage of pregnant women living with HIV of at least 90%; and
- treatment coverage of syphilis-seropositive pregnant women of at least 95%.

A broader set of recommended indicators for the PMTCT of HIV and syphilis will be reviewed during the validation process. WHO regional offices and headquarters, in partnership with UNAIDS, UNFPA, UNICEF and other key partners and experts, will perform the regional and global validation committee functions. The sustaining of the elimination of mother-to-child transmission of HIV and syphilis will be monitored annually, using existing routine global reporting mechanisms.

ARV drugs for PMTCT among pregnant women of about 90% or higher for the four years between 2010 and 2013. These achievements are translating into modelled mother-to-child transmission rates of about 10% or less in those countries (these are the "final" or overall rates of transmission; six-week transmission rates are lower). However, lack of accurate data on adherence to ARV drugs during the postpartum period still complicates accurate modelling of the overall mother-to-child transmission rates. In addition, complete data on the outcomes of PMTCT of HIV for children are not routinely available, and loss to follow-up remains a major issue for HIV-exposed infants. Despite these limitations, in some countries better data are being collected through case reporting and from laboratory data on HIV tests among children as well as from special surveys to help improve country estimates. Nationally representative surveys in South Africa evaluating the effectiveness of programmes for PMTCT of HIV have showed that mother-to-child transmission at 4–8 weeks improved from 3.5% in 2010 (4) to 2.7% in 2011 *(5)*. Similar results were observed for the 2012–2013 cohort, and follow-up studies are underway to assess postpartum transmission and final transmission rates.

Fig. 3.1. Estimated HIV testing and counselling coverage among pregnant women, low- and middle-income countries overall and by WHO region, 2005 and 2009–2013



Sources: number of pregnant women tested reported by countries: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS); estimated number of live births as a proxy for the number of pregnant women: Population Division, United Nations Department of Economic and Social Affairs.

Some countries, such as Cuba and Panama in the WHO Region of the Americas, have low numbers of pregnant women with HIV and have implemented highly successful programmes for PMTCT of HIV and are reporting very few children newly infected with HIV by mother-to-child transmission. WHO has led the development of a framework and operational tools for validating and certifying whether a country has succeeded in eliminating mother-to-child transmission as a significant public health concern (Box 3.2). Gathering reliable data for assessing final transmission outcomes among all HIV-exposed infants will become increasingly important to validate that the mother-to-child transmission of HIV has been eliminated.

3.1.2 More pregnant women are being tested for HIV and know their HIV status …

As with previous guidance, the WHO 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection *(6)* recommend universal HIV testing for all pregnant women as part of the basic package of services for antenatal care. Testing is the key first step and entry point to services for PMTCT of HIV. An estimated 44% of pregnant women in low- and middle-income countries had an HIV test and received their results in 2013 (including those with known HIV-positive status) – up from 8% in 2005 and 26% in 2009, but well short of the desired 95% coverage among pregnant women (Fig. 3.1).

Countries with a high national prevalence of HIV generally tend to have high HIV testing coverage among pregnant women. In seven of the Global Plan priority countries (Botswana, Mozambique, Namibia, South Africa, Uganda, Zambia and Zimbabwe), about 95% or more pregnant women knew their HIV status in 2013, but coverage was less than 40% in Angola, Chad, the Democratic Republic of the Congo and Nigeria. The estimated prevalence of HIV infection in the adult population is estimated to exceed 10% in six countries with very high testing coverage and to be less than 5% in four countries with low coverage. However, there are large numbers of pregnant women living with HIV in the Democratic Republic of the Congo and Nigeria, countries with large overall populations (Table 3.2).

At the regional level, the proportion of pregnant women tested in the WHO African Region increased from 34% in 2009 to 51% in 2013. However, stark differences persist within the region: 74% of the pregnant women in eastern and southern Africa knew their HIV status in 2013, compared with only 35% of pregnant women in western and central Africa. The HIV testing coverage among pregnant women is improving in most other regions as well. However, the HIV testing rates for pregnant women in the WHO Eastern Mediterranean Region are extremely low.

Further, low testing coverage in some countries with large numbers of pregnant women decreases the overall testing coverage among the estimated 126 million pregnant women globally, even though excellent progress is being made towards universal coverage of testing of pregnant women in several countries with smaller populations and a high prevalence of HIV infection. For example, the proportion of pregnant women who knew their HIV status in 2013 was estimated at 37% (of about 26 million women) in India, 25% (of 7.2 million women) in Nigeria, and 0.1% (of 4.6 million women) in Pakistan.

Testing is a vital first step for linking women living with HIV into care, and it is recommended that all pregnant women living with HIV start ART. Achieving full coverage of HIV testing for pregnant women remains the top priority, along with assuring the quality of rapid testing. Other opportunities for greater progress involve expanding testing interventions to include retesting women later in pregnancy if they had initially tested HIV-negative (particularly in high-prevalence settings), promoting couples testing and providing ART for HIV-serodiscordant couples. Making HIV testing and counselling part of the basic package of services for antenatal care and testing women of unknown serostatus at delivery or postpartum – as recommended in the recent WHO consolidated guidelines *(3)* – should contribute further to expanded testing coverage.

3.1.3 … coverage of ARV medicines to reduce mother-to-child transmission of HIV is expanding

All pregnant and breastfeeding women living with HIV are eligible for and need ARV drugs to prevent mother-to-child transmission, and with option B+ all these women are eligible and need lifelong ART. A core target of the Global Plan is to provide ARV drugs to 90% of the world's pregnant women living with HIV by the end of 2015.

Globally, an estimated 966 000 women, or about two thirds (67%, range 62–73%) of the pregnant women living with HIV in low- and middle-income countries, received at least some effective ARV drugs in 2013. This marks an increase in PMTCT ARV coverage from 47% [29%–33%] in 2009 and 56% [52%–61%] in 2011, and reflects rising PMTCT ARV drug enrolment rates and a slight decline in the numbers of pregnant women living with HIV (Fig. 3.2). These aggregate data include the provision of several recommended regimens (options A, B and B+) and only reflect the initiation of the ARVs. Nevertheless, the data do show a shift towards more effective regimens and longer durations of coverage.

A very large proportion of pregnant women living with HIV who need ARV drugs for PMTCT of HIV continue to receive it in the WHO European Region. Recent coverage levels have been sustained in the WHO Region of the Americas, where coverage was high, and in the WHO African Region. There was strong progress in the WHO Western Pacific Region and, to a lesser extent, in the South-East Asia Region. Achieving the global 90% coverage target will require accelerating this positive trend, especially in countries with a high HIV burden and low ARV drug coverage.

Coverage of ARV drugs among pregnant women with HIV varies significantly across regions. In 2013, coverage of ARV drugs remained high in the WHO European Region, followed by the WHO Region of the Americas (93%, range 51–>95%), and the WHO African Region (68%, range 62–74%). All the other regions have also made progress, but overall coverage in 2013 in the WHO Western Pacific Region was still relatively low at 58% [41%–77%]. Coverage was 26% [19%–31%] in the WHO South-East Asia Region as well as 26% [18%–39%] in the WHO Eastern Mediterranean Region.

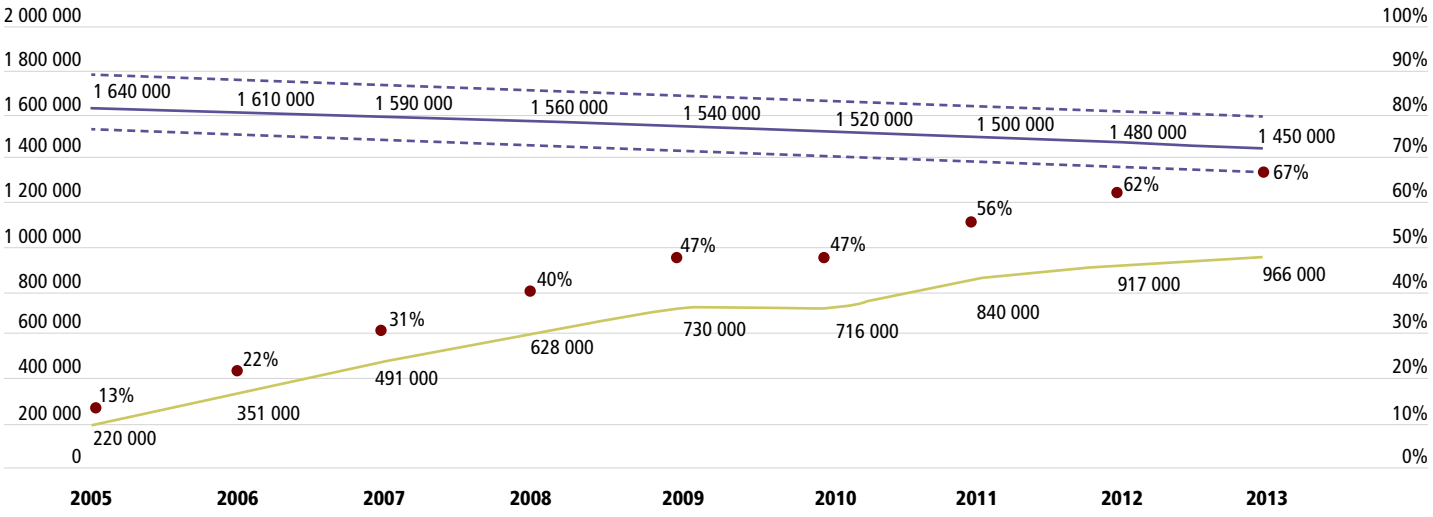
The total number of women receiving ARV drugs for PMTCT of HIV is strongly influenced by developments in the WHO African Region, which is home to about 87% of the pregnant women living with HIV in low- and middle-income countries. In the 21 Global Plan priority countries in the WHO African Region, the number and percentage of pregnant women living with HIV and receiving ARV drugs has been increasing since 2009. Since more effective ARV drug regimens have been provided during the past three years and the increased

Table 3.3. HIV prevalence among pregnant women (2013), number of births (2013) and HIV testing and counselling coverage among pregnant women (2005, 2009 and 2013) in the 22 Global Plan priority countries

Country	Estimated HIV Prevalence among pregnant women (2013)	Estimated live births (2013)	Estimated percentage of pregnant women who knew their HIV status		
			2005	2009	2013
Angola	2%	950 000	1%	23%	33%
Botswana	23%	48 000	90%	93%	>95%
Burundi	1%	450 000	1%	28%	74%
Cameroon	5%	830 000	15%	37%	52%
Chad	2%	590 000	<1%	6%	34%
Côte d'Ivoire	3%	740 000	6%	50%	74%
Democratic Republic of the Congo	1%	2 890 000	3%	9%	9%
Ethiopia	1%	3 110 000	2%	16%	42%
Ghana	2%	800 000	4%	50%	63%
India	not available	25 600 000	2%	22%	37%
Kenya	5%	1 550 000	31%	65%	88%
Lesotho	23%	57 000	10%	53%	52%
Malawi	9%	650 000	11%	53%	76%
Mozambique	9%	1 010 000	11%	70%	>95%
Namibia	17%	60 000	46%	88%	>95%
Nigeria	3%	7 170 000	<1%	13%	25%
South Africa	25%	1 100 000	47%	>95%	93%
Swaziland	31%	37 000	39%	71%	79%
Uganda	7%	1 630 000	18%	65%	>95%
United Republic of Tanzania	6%	1 930 000	14%	66%	70%
Zambia	12%	620 000	14%	95%	>95%
Zimbabwe	13%	450 000	26%	41%	>95%
Total for Global Plan priority countries	2%	52 270 000	6%	29%	45%

Sources: HIV prevalence among pregnant women is based on Spectrum estimates 2013. The number of pregnant women who know their HIV status as reported by countries for the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS). The number of pregnant women is based on the estimated live births as reported by: Population Division, United Nations Department of Economic and Social Affairs *(8)*.

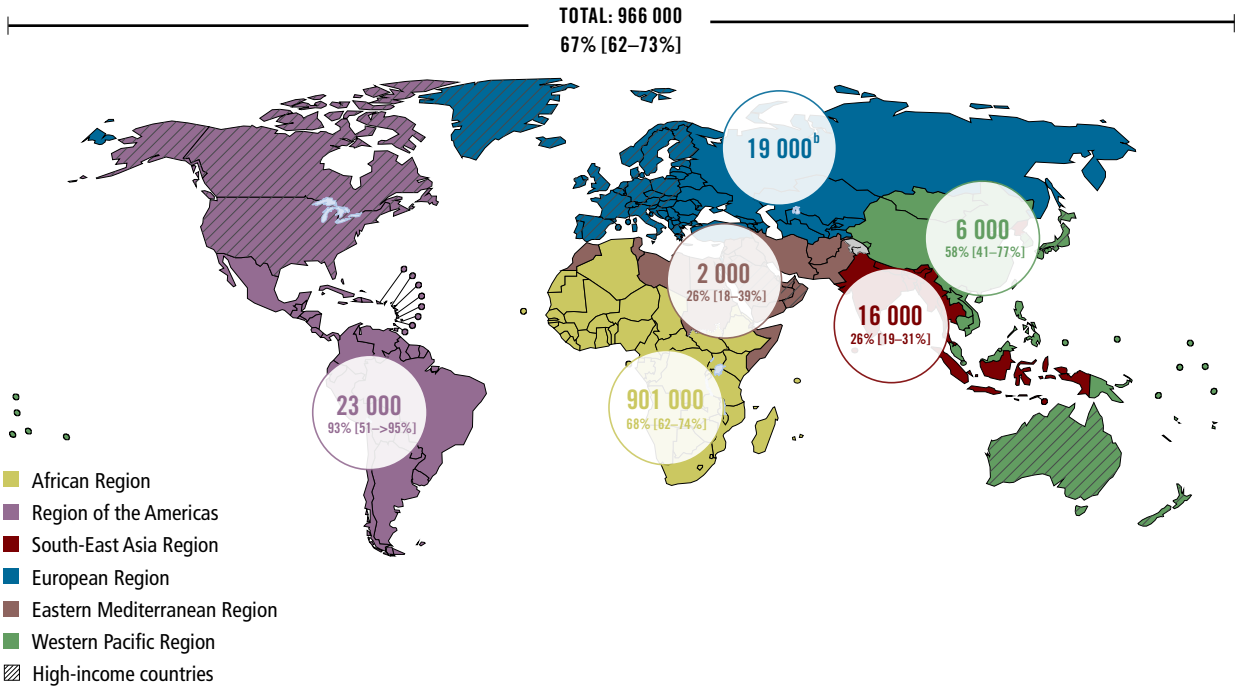
Fig. 3.2. Number of pregnant women living with HIV in low- and middle-income countries and the number and percentage of those women receiving ARV drugs for PMTCT of HIV, 2005–2013



Single-dose nevirapine is included in the data for 2005 to 2009.

Sources: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) and validation process for the number of pregnant women living with HIV receiving ARV drugs for PMTCT, and UNAIDS 2013 estimates for the number of pregnant women living with HIV.

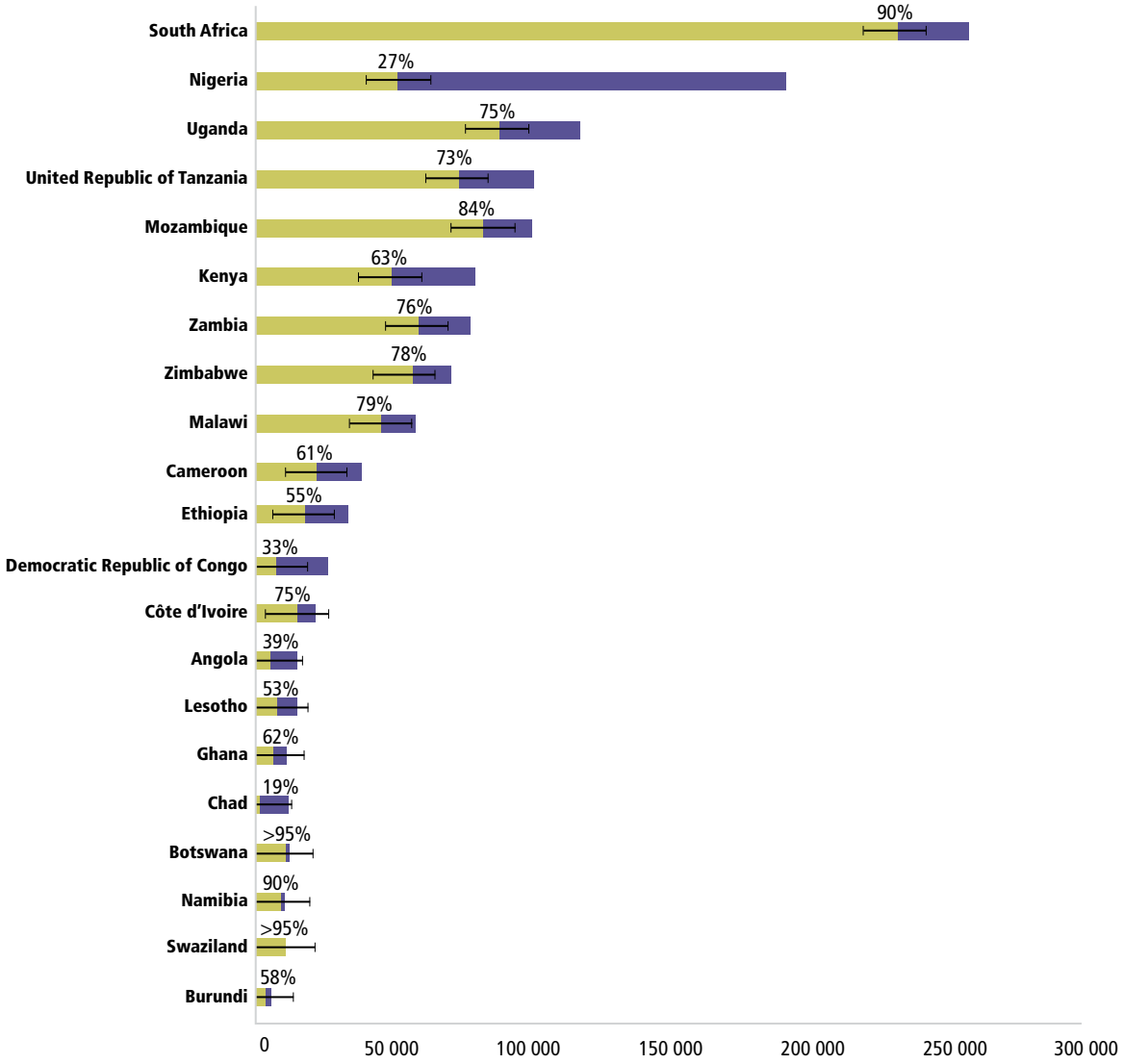
Fig. 3.3. Number and percentage of pregnant women living with HIV who received ARV drugs in low- and middle-income countries globally and by WHO region, 2013[a]



[a] Country income classification by the World Bank at the time of the 2011 Political Declaration on HIV and AIDS.
[b] Coverage estimates for the WHO European region are not available due to inconsistencies between programme coverage and estimated PMTCT need.

Sources: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) and 2013 UNAIDS/WHO estimates.

Fig. 3.4. Number and percentage of pregnant women living with HIV receiving ARV medicines for PMTCT of HIV in the 21 Global Plan priority countries in the WHO African Region, 2013



Source: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS).

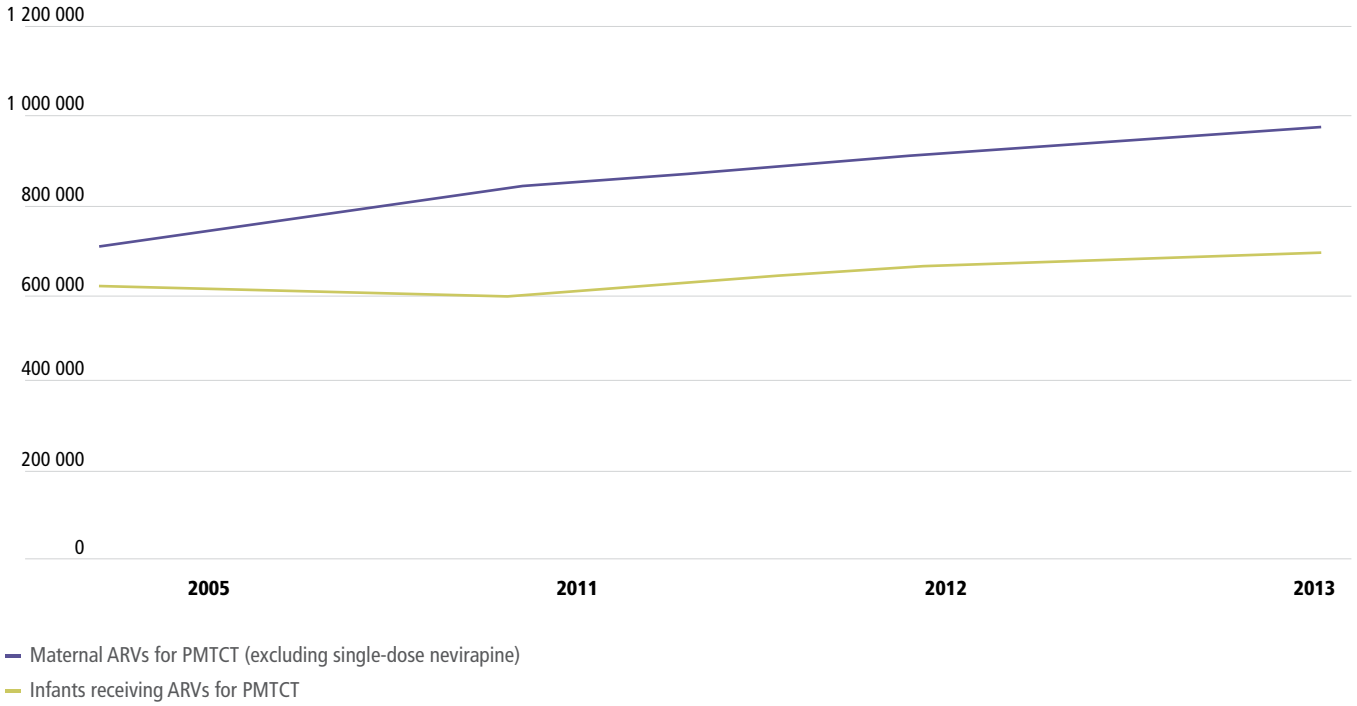
ARV drug coverage also reflects the use of more effective regimens, this improvement is compounded. On the other hand, the ARV coverage indicator reflects initiation or provision of ARV drugs in earlier stages of the pregnancy, or intention to treat, and does not necessarily indicate continued ARV drug coverage throughout the entire mother-to-child transmission risk period (which includes the breastfeeding period in some settings, including in most high-burden settings).

Several Global Plan priority countries have made strong progress in scaling up their programmes for PMTCT of HIV: Botswana, Namibia, South Africa and Swaziland have reached or are estimated to be close to reaching the 90% maternal ARV drug coverage target.

Nevertheless, considerable improvement is needed in the priority countries (Angola, Chad, Democratic Republic of the Congo and Nigeria) in which less than 40% of pregnant women living with HIV received ARV medicines for PMTCT of HIV in 2013. Overall, the 21 Global Plan priority countries in the WHO African Region accounted for 82% of the estimated global number of children newly infected with HIV in 2013.

In addition to providing ARV drugs to pregnant women living with HIV, which remains the mainstay of ARV drug interventions for PMTCT of HIV, infants born to women living with HIV should receive 4–6 weeks of ARV drugs from birth *(3)*. In 2013, about 700 000 infants born to women living with HIV in low- and middle-income

Fig. 3.5. Estimated number of pregnant women living with HIV receiving ARV drugs and of infants receiving ARV drugs for PMTCT of HIV in low- and middle-income countries, 2005–2013



Sources: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS).

countries were reported to have received the infant prophylaxis component of the PMTCT ARV regimen (Fig. 3.5), about 36 000 more than in 2012. These 700 000 infants represented only about half of all infants born to women living with HIV in 2013.

3.1.4 … and coverage of ART is expected to keep increasing

The 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection *(3)* recommend that all pregnant women living with HIV initiate ART regardless of CD4 cell count (options B and B+) and that, in most settings, women continue with lifelong treatment (option B+).

Of the over one million women who received any ARV drug for PMTCT of HIV in 2013 (this includes an additional 44 000 women who received single-dose nevirapine), about 70% received a triple ARV regimen (option B or option B+). They included women who received lifelong ART as well as those who received ART prophylaxis only during the MTCT risk period. The remaining 27% of women received maternal zidovudine-based regimens (option A), while about 44 000 women (<5%) were reported to have received single-dose nevirapine, which WHO no longer recommends (Fig. 3.6).

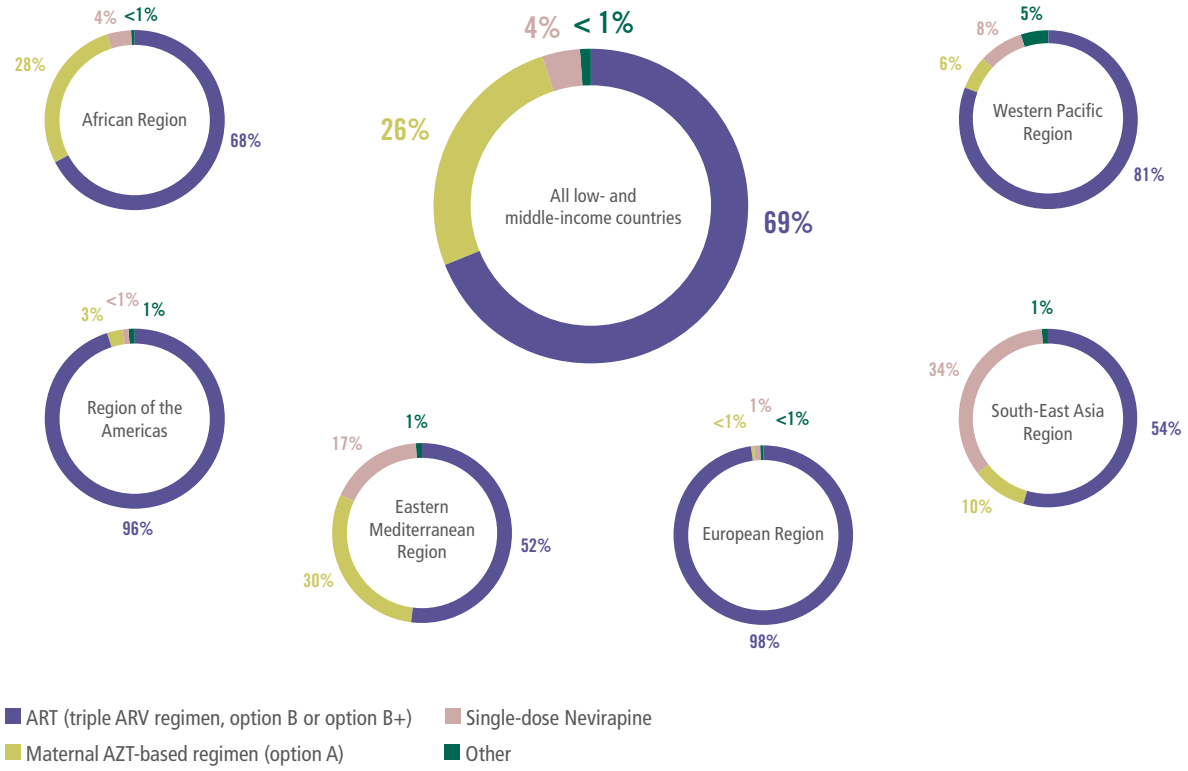
An important rationale for adopting option B+ is the need to improve the mother's health by initiating lifelong ART, regardless of other eligibility criteria. Further implementation of option B+ and adoption of the 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection *(3)* should streamline, simplify and expand the delivery of ARV medicines to pregnant women living with HIV. The provision of lifelong treatment is expected to expand further with the rapid scaling up of option B+ in 2014.

Adherence to ART is critically important for effective treatment for the mother and for preventing HIV transmission to the infant. However, studies indicate that poor adherence is an important issue in some regions *(9,10)*. A review of studies that included more than 20 000 women (from Kenya, South Africa, the United States of America and Zambia) reported that, although 76% of pregnant women adhered to ARV regimens during pregnancy, only 53% did so postpartum *(11)*. The reasons for poor adherence to ART after childbirth appear to include a lack of motivation to continue ART, economic and emotional stress, stigma and ART dosing frequency or pill burdens. Resolving these issues is important to realize the full benefits of option B+ *(10,11)*.

National-level data describing the adoption of option B+ are available from Malawi and are expected to become available in more countries in the next few years. After adopting option B+, Malawi achieved a 7.5-fold increase in the number of pregnant women living with HIV receiving ART over a 15-month period in 2011–2012 *(12)*. The retention in care at 12 months among women starting ART under option B+ was comparable to the

retention rates achieved in the country's adult ART programme overall *(12)*. The national programme data from Malawi for the fourth quarter of 2013 indicated 73% retention at 12 months and 71% retention at 24 months among pregnant and breastfeeding women starting ART under option B+. Analysis of the data revealed that most of the women lost to follow-up had failed to return after initiating ART, whereas retention was high among the women who returned at least once *(13)*. Although retention rates may be context-specific, data from project sites in various countries confirm that early dropout rates and retention among pregnant women are frequent concerns. This highlights a need to understand the reasons for loss to follow-up and to implement strategies to increase and regularly monitor retention.

Fig. 3.6. Regimen distribution of all ARV medicines for PMTCT of HIV in low- and middle-income countries, 2013



Sources: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) and validation process for the number of pregnant women living with HIV receiving ARV drugs for PMTCT.

3.1.5 Preventing the transmission of HIV from mothers to children during breastfeeding is still a challenge

Without any interventions, an estimated 5–20% of infants born to mothers living with HIV will acquire HIV through breastfeeding *(14)*. As increasing numbers of women living with HIV initiate ART, including during pregnancy, the risk of HIV transmission during pregnancy, labour and delivery is declining. However, a concern remains that a growing proportion of children acquiring HIV may now be infected postpartum, during breastfeeding.

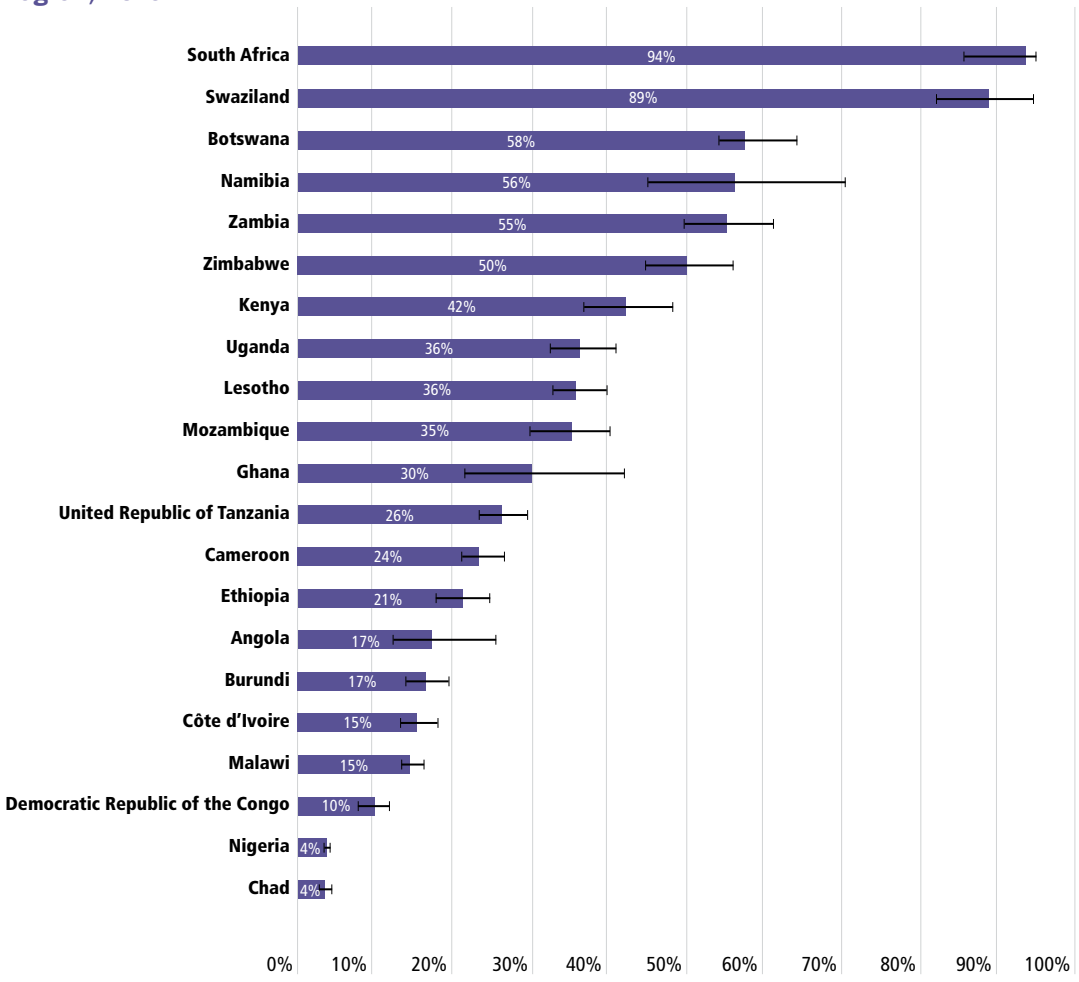
Unfortunately, accurate national-level data on ARV drug coverage during the breastfeeding period are not yet widely available. Although the 21 Global Plan countries in the WHO African Region deem these data relevant for their programmes, only 10 countries were able to report programme data on the number of women who were breastfeeding and receiving ARV drugs, and nine of these countries estimated that 40% or less breastfeeding infants were being protected by ARV drugs. Estimates of postpartum ARV drug coverage are important inputs for the Spectrum model[4] in countries where a majority of HIV-exposed children breastfeed. Estimates of mother-to-child transmission rates and of the number of children newly infected with HIV during the postpartum period can be improved through the enhanced collection of programme data.

[4] Spectrum is an HIV modelling software programme that is used to estimate the number of people living with HIV as well as the outcomes and impact of HIV programmes, such as mortality, mother-to-child transmission rates, new HIV infections and more.

3.1.6 Not enough infants born to women living with HIV are receiving virological tests for HIV

WHO recommends that infants born to mothers living with HIV (HIV-exposed infants) be tested within their first two months of life, using a virological test, which is currently done mostly with polymerase chain reaction testing of dried blood spots *(15)*. ART should be started as soon as an infant (or any child younger than five years) is diagnosed with HIV, regardless of clinical and immune system status. Diagnosing HIV in infants and young children and linking those living with HIV to ART continues to pose difficulties in many countries. Although early infant diagnosis programmes have been expanding

Fig. 3.7. Percentage of infants born to pregnant women living with HIV receiving a virological test for HIV within two months of birth in the 21 Global Plan countries in the WHO African Region, 2013



Source: number of infants receiving a virological test for HIV within two months of births reported by countries: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS); number of pregnant women living with HIV as a proxy for HIV-exposed infants: UNAIDS 2013 estimates.

in most countries, slightly more than 520 000 HIV-exposed infants, or about 44%, received a virological test in the 88 low- and middle-income countries reporting these data in 2013. In some regions, notably the WHO European Region and Western Pacific Region, improvements from 2011 to 2013 have stemmed from the increased numbers of infants being tested in some countries with the largest burdens of HIV infection. However, some key countries from each region did not report data; accurate estimates of regional early infant diagnosis coverage for 2013 therefore are not yet available.

Among the 21 Global Plan priority countries in the WHO African Region, three achieved substantial increases in the number of infants receiving early HIV testing: Burundi, Malawi and Zimbabwe. Only six of those 21 countries were providing early infant diagnosis to more than 50% of HIV-exposed infants in 2013: South Africa (94%), Swaziland (89%), Botswana (58%), Namibia (56%), Zambia (55%) and Zimbabwe (50%). In the remaining Global Plan countries, the number of infants (Fig. 3.7) receiving virological testing was less than 50% and was unchanged or decreased slightly from previous years.

Countries are receiving support to scale up early infant testing and to implement more effective follow-up of HIV-exposed infants until a definitive HIV diagnosis can be made once the infants are 18 months old.

Until very recently, sequential HIV testing after cessation of breastfeeding to determine the child's final HIV status has been poorly monitored, and this has limited countries' abilities to measure the overall impact of their programmes for PMTCT of HIV. Stronger efforts are also needed to increase provider-initiated testing and case-finding of children who have potentially acquired HIV, both through routine child health services and at other venues that offer opportunities for children to receive HIV testing.

WHO recommends provider-initiated testing for all children attending health facilities. Evidence from the WHO African Region suggests that such routine HIV counselling and testing in inpatient settings could be more effective than community-based testing for identifying infants with more severe, rapidly progressing HIV disease *(16)*. In 2012, only 55% of 84 countries reporting in the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) said they had a national policy requiring the routine offer of HIV testing and counselling for children.

Low coverage of early infant diagnosis is mirrored in the low HIV care coverage for infants and children. In some settings, only about one third of the infants with HIV who are identified through virological testing are promptly referred to treatment facilities to start ART *(17)*. Improvements are possible, as seen in South Africa, for example. Analysis of public sector laboratory data from South Africa's Western Cape Province shows that the proportion of infants linked to care increased from 54% to 71% between 2005 and 2011, and delays in linkage declined from 146 days to 33 days *(18)*. The study confirms that broad-based programmes for definitive HIV diagnosis among HIV-exposed infants and successful linkage to care are feasible in resource-limited settings.

To improve the outcomes for children, programmes need to increase the coverage of early infant diagnosis and reduce delays between collecting specimens, laboratory testing and sharing the results with families (for example, by using mobile phone technologies). Promising new point-of-care technologies for polymerase chain reaction testing could also help increase testing coverage and reduce the gap between testing, confirming HIV status and initiating ART.

3.2 Countries are seizing opportunities to prevent the mother-to-child transmission of syphilis

Untreated syphilis in pregnancy results in adverse outcomes among more than half the infected women. Modelling based on data reported through the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) and on previously published methods *(19)* indicates that there were about 950 000 maternal syphilis infections in 2012 and that these resulted in 360 000 adverse outcomes, including 150 000 early fetal deaths or stillbirths, 50 000 preterm or low-birth-weight infants, 60 000 neonatal deaths and 110 000 infants with congenital infection.

From 2008 to 2012, maternal syphilis infections and adverse pregnancy outcomes declined by 33%. More than one third (37%) of that decline occurred in India because of improved data quality and efforts to control sexually transmitted infections. However, even when India was excluded from the analysis, the prevalence of maternal syphilis declined by 11% and there were 10% fewer adverse pregnancy outcomes during that same period *(20)*. These data indicate a critical need for combining syphilis control efforts in the general population, routine antenatal testing for syphilis and appropriate treatment of women who have syphilis.

Syphilis testing during pregnancy is a valuable intervention for preventing HIV infection among pregnant women. Initiatives for the dual elimination of the mother-to-child transmission of HIV and syphilis in the WHO Region of the Americas, African Region, Western Pacific Region and South-East Asia Region recognize the role that syphilis plays in increasing the mother-to-child transmission of HIV and the opportunities that exist for common solutions and interventions. Of the 127 countries responding in the Global AIDS Response Progress Reporting round for 2013, 47% noted that they had a national plan for eliminating the mother-to-child transmission of syphilis that was integrated with HIV or other elimination initiatives, 13% had a stand-alone plan and 40% had no such national plan.

Since WHO and various partners launched a global initiative in 2007 to eliminate congenital syphilis as a public health concern *(21)*, there has been heartening progress toward eliminating the mother-to-child transmission of syphilis. In the 84 countries reporting these data for 2013 in the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS), 84% of women in antenatal care were tested for syphilis during their first visit versus 78% in 2008 (see Table 3.3). About 0.6% of these women tested positive, of whom reportedly 94% received treatment, although variation was marked by country and region. However, country-specific data highlight the need for increasing the coverage of syphilis testing among antenatal care attendees in many countries, in particular in the WHO African Region.

In 2013, 14 countries reported testing coverage for syphilis during antenatal care of at least 95% and similar levels of coverage for treatment of antenatal care attendees

[5] Belarus, Chad, Cuba, Grenada, Kazakhstan, Malaysia, Malta, Mauritius, Republic of Moldova, Slovakia, Thailand, Tuvalu, Ukraine and United Kingdom.

Table 3.4. Proportions of pregnant women in antenatal care who were tested for syphilis, who tested positive and who received treatment, 2008/2010 and 2013

WHO Region	Indicator 1: Percentage of antenatal care attendees tested for syphilis				Indicator 2: Percentage of antenatal care attendees tested who are positive for syphilis				Indicator 3: Percentage of antenatal care attendees who tested positive for syphilis and who received treatment			
	2008		2013		2008		2013		2010		2013	
	Number of reporting countries	Median value reported	Number of reporting countries	Median value reported	Number of reporting countries	Median value reported	Number of reporting countries	Median value reported	Number of reporting countries	Median value reported	Number of reporting countries	Median value reported
African Region	18	59%	23	58%	30	2.3%	30	2.2%	15	100%	16	96%
Region of the Americas	14	73%	25	83%	14	0.9%	26	0.6%	16	85%	18	82%
Eastern Mediter-ranean Region	3	–	4	–	4	–	7	0.0%	0	–	2	-
European Region	9	100%	13	99%	9	0.3%	14	0.1%	3	–	9	100%
South-East Asia Region	3	–	8	75%	6	1.3%	5	0.3%	3	–	4	–
Western Pacific Region	4	–	11	96%	8	0.3%	12	0.2%	7	98%	4	–
Global	51	78%	84	84%	71	1.4%	94	0.6%	44	99%	52	94%

The regional median is not shown if fewer than five countries reported.

Surce: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS).

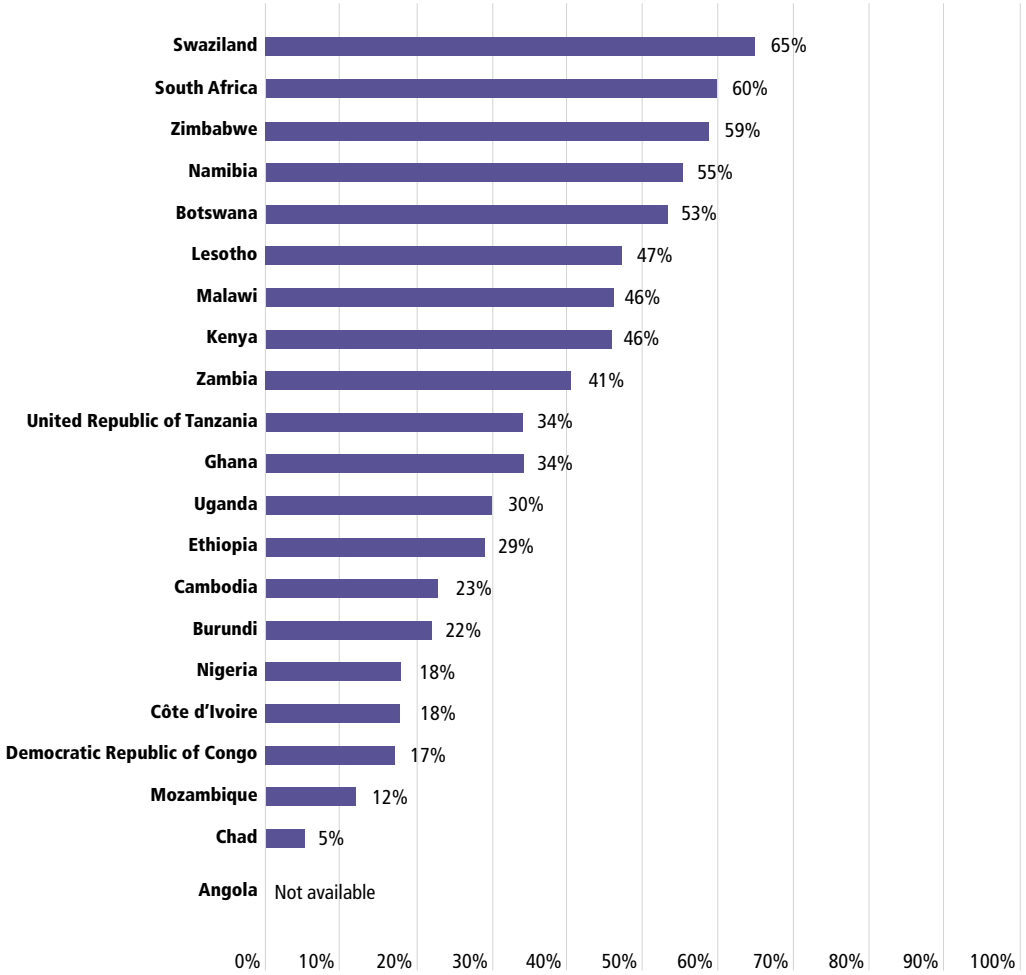
who tested positive for syphilis: two of the four criteria for validating the elimination of the mother-to-child transmission of syphilis *(22)*.[5] Forty-seven countries reported congenital syphilis rates in 2014, a new Global AIDS Response Progress Reporting indicator. Actual elimination cannot be validated, however, until formal regional and global processes for validation have been completed, including an assessment of antenatal care coverage, congenital syphilis rates and data quality.

3.3 Primary prevention among women and girls of childbearing age needs to be stepped up

Preventing HIV infection among women and girls of childbearing age (prong 1 of the Global Plan) and helping women and girls who are living with HIV to avoid unwanted pregnancies (prong 2) are vital for preventing children from acquiring HIV infection. Progress in these areas has to speed up and data need to be improved to monitor progress more accurately. Continued efforts are needed to achieve comprehensive HIV prevention programming for women and girls, including pregnant women in antenatal care.

The unmet need for family planning services among women living with HIV varied only slightly between 1990 and 2010, from 15% to 12% *(23)*, and continues to undermine

Fig. 3.8. Contraceptive use among married women 15–49 years old in the 21 Global Plan priority countries in the WHO African Region, 2006–2012



Source: Multiple Indicator Cluster Surveys, Demographic and Health Surveys and other nationally representative sources, 2006–2012.

efforts to eliminate new infections among children *(24)*. UNAIDS data indicate that, in eastern and western Africa, the unmet need for family planning services was about 20% throughout that decade, with little improvement (7). This means that more than one in five women in stable relationships expressing the desire to delay or stop childbearing were not using contraception. Similarly, 15 of the 20 Global Plan priority countries in the WHO African Region that have recent nationally representative survey data reported that less than half the married women 15–49 years old were using any contraceptive method at the time of the survey (Fig. 3.8) *(25)*.

Preventing HIV and unwanted pregnancies among women and girls of childbearing age requires access to rights-based, non-coercive family planning for all women, especially via entry points such as maternal and child health and sexual and reproductive health services as well as primary health care services. Ultimately, successful progress in prongs 1 and 2 would lead to a reduction in the total number of pregnant women with HIV. Estimates from 2001–2013 show that the total number of pregnant women living with HIV in low- and middle-income countries decreased from about 1.7 million [1.5 million–1.8 million] to about 1.4 million [1.3 million–1.6 million]. However, in some regions, such as the WHO Eastern Mediterranean Region, the estimated number of pregnant women with HIV may have increased, which is a concern. Even if vertical transmission of HIV is controlled, the number of pregnant women with HIV needs to decrease if mother-to-child transmission of HIV is to be eliminated. Intensified efforts and greater success with respect to prongs 1 and 2 of the Global Plan will be critically important for achieving that goal.

Table 3.5. Estimated number of pregnant women with HIV in low- and middle-income countries by WHO region, 2001–2013

	2001	2005	2009	2013
African Region	1 500 000 (1 400 000 – 1 700 000)	1 500 000 (1 400 000 – 1 600 000)	1 400 000 (1 300 000 – 1 500 000)	1 300 000 (1 200 000 – 1 400 000)
Region of the Americas	42 000 (38 000 – 51 000)	38 000 (34 000 – 46 000)	34 000 (29 000 – 44 000)	32 000 (25 000 – 53 000)
Eastern Mediterranean Region	4 400 (2 900 – 6 600)	5 700 (4 300 – 7 700)	6 700 (5 100 – 8 900)	7 900 (5 300 - 12 000)
European Region	not available	not available	not available	not available
South-East Asia Region	80 000 (71 000 – 110 000)	78 000 (72 000 – 100 000)	68 000 (62 000 – 86 000)	62 000 (51 000 – 85 000)
Western Pacific Region	10 000 (8 600 – 12 000)	12 000 (9 900 – 13 000)	11 000 (9 000 – 13 000)	10 000 (8 000 – 15 000)
All low- and middle-income countries	1 700 000 (1 500 000 – 1800 000)	1 600 000 (1 500 000 – 1800 000)	1 500 000 (1 400 000 – 1 700 000)	1 400 000 (1 300 000 – 1 600 000)

Source: UNAIDS 2013 HIV estimates.

Chapter 4. EXPANDING HIV TESTING AND COUNSELLING

Key Messages

More people are taking HIV tests

But too many people remain unaware of their HIV infection or are not being linked to HIV care after learning of their status.

- The number of people tested in 2013 in 77 reporting countries increased by about one third compared with 2009.
- But in the majority of countries reporting data, less than half the people living with HIV have ever had an HIV test and received their test result.
- More diverse testing approaches are available and are being used. Almost all reporting countries have explicit policies for provider-initiated testing and counselling in health facilities.
- Partner testing is expanding rapidly – by June 2014, more than half the 58 WHO HIV focus countries had adopted policies for couples testing and treatment of the HIV-positive partners.
- Testing services are being moved closer to communities: 85 of 119 countries were using community-based testing approaches in 2013.
- Self-testing is being used increasingly as an additional testing option. France, Hong Kong Special Administrative Region, Kenya, the United Kingdom and the United States of America have already developed policies on self-testing.
- In countries with a high HIV prevalence or generalized HIV epidemics, testing rates are generally lower for men than for women.
- The use of HIV testing and counselling services is especially low among adolescents and some key populations.
- The proportion of individuals who are lost to follow-up between HIV diagnosis and ART initiation remains high in many countries.

Maximizing the impact of HIV treatment and care starts with identifying more people who need ART, doing so before their health declines and linking them reliably to care services. Countries in all regions have been diversifying testing approaches and introducing effective testing technologies, including rapid diagnostic tests *(1)*.

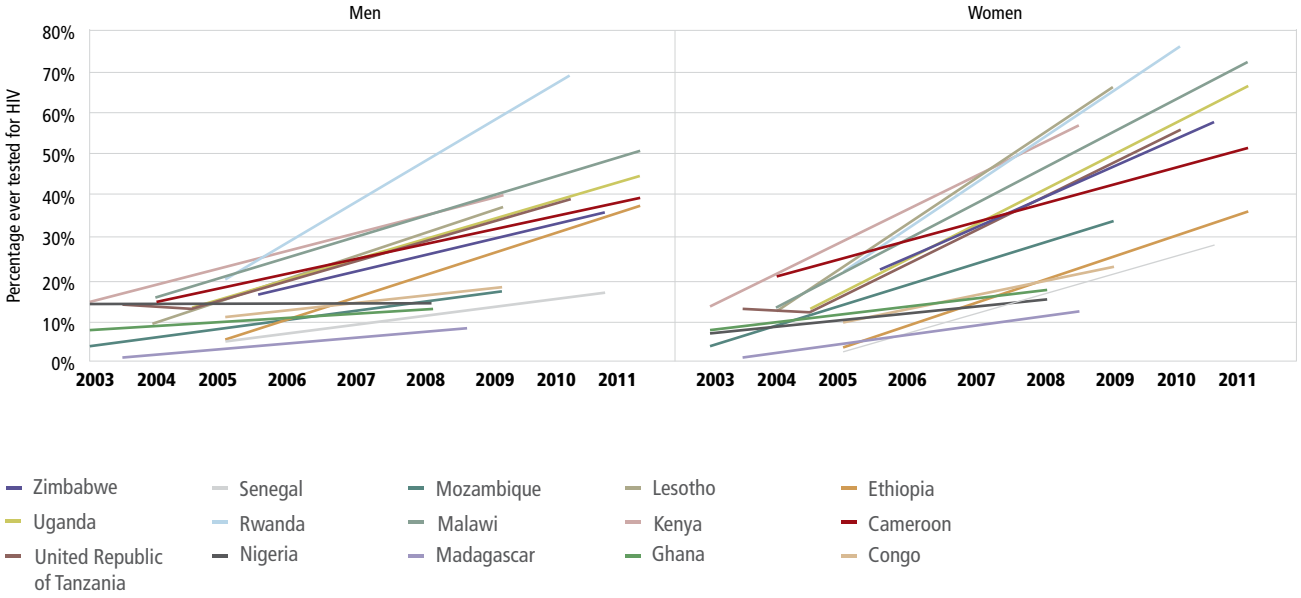
4.1 More people are taking HIV tests

The Global AIDS Response Progress Reporting shows that overall uptake of HIV testing and counselling increased by about 33% between 2009 and 2013 in the 77 countries reporting data across that period, with testing uptake expanding especially strongly in the WHO African Region (Fig. 4.1).

Although impressive, the increases in HIV testing do not necessarily mean that the people living with HIV are increasingly accessing testing and counselling service. However, as Table 4.1 indicates, in some countries that conducted population-based surveys with HIV testing in the WHO African Region, adults living with HIV indeed were more likely than HIV-negative adults to have taken an HIV test and received the results. Further, many adults living with HIV in these countries were unaware that they had acquired HIV, and men were less likely than women to know their serostatus. Adolescents and key populations also appear to have especially low uptake of HIV testing and counselling. Access to and coverage of these services vary greatly by country, but Demographic and Health Surveys and Multiple Indicator Cluster Surveys from 2008 to 2012 in the WHO African Region, for example, indicate that fewer than one in five adolescent girls aged 15–19 years were aware of their HIV status.

In countries with low HIV prevalence or concentrated HIV epidemics, much testing and counselling still tends to occur in antenatal services and does not necessarily reach key populations. Based on data from the Global AIDS Response Progress Reporting and the European Centre for Disease Prevention and Control, the WHO Regional

Fig. 4.1. Percentage of people 15–49 years old who were ever tested for HIV and received their result in 15 selected countries in the WHO African Region, 2003–2011



Source: Staveteig S et al. *(2)*.

Table 4.1. Percentages of women and men aged 15–49 years who have ever been tested for HIV and received their results by serostatus, various countries, 2010–2012

Country	Source	Year of survey	HIV-positive		HIV-negative	
			Women	Men	Women	Men
Benin	DHS	2011–2012	50%	7%	31%	11%
Côte d'Ivoire	DHS	2011–2012	42%	40%	34%	23%
Gabon	DHS	2012	77%	59%	67%	47%
Guinea	DHS	2012	16%	(26%)	10%	12%
Haiti	DHS	2012	62%	46%	46%	29%
Niger	DHS	2012	(49%)	[a]	20%	8%
Senegal	DHS	2010–2011	(34%)	[a]	27%	17%
United Republic of Tanzania	AIS	2011–2012	73%	61%	62%	47%

[a] The figures are based on fewer than 25 unweighted cases and have been suppressed. The figures in parentheses are based on 25–49 unweighted cases.

Source: DHS Program [website] *(3)*.

Office for Europe estimates that, by 2012, for example, at least 50 million people in the WHO European Region had been tested for HIV. However, testing coverage among key populations was only 37–53%, well short of the 90% target for 2015. Stigma and a range of social, logistical and legal barriers continue to hinder the access of key populations to testing and counselling services *(4)*. Meanwhile, in many countries the HIV testing and counselling data collected for key populations, including for sex workers, are often based on small samples from limited settings and therefore do not necessarily provide accurate pictures of overall testing uptake in these populations.

According to Demographic and Health Surveys and AIDS Indicator Surveys, countries with high HIV prevalence or generalized HIV epidemics generally have lower testing

rates for men than for women, largely because (according to the Global AIDS Response Progress Reporting) testing and counselling especially focuses around reproductive health services, where routine offers of HIV testing are becoming the norm. In the WHO African Region, that disparity was evident in 24 of the 30 countries that conducted Demographic and Health Surveys or AIDS Indicator Surveys between 2003 and 2012. The pattern highlights the need for strategies that increase men's uptake of HIV testing and counselling, including providing testing in settings that are more accessible and acceptable to men and devising ways to encourage more men to test with their partners in clinical settings.

4.2 Testing and counselling approaches are diversifying

The overall increase in testing uptake stems from expanding provider-initiated testing and counselling in clinical services, introducing more community-based testing approaches and strengthening support for the testing of partners and family members of people living with HIV. Almost all countries provide HIV test results on the same day of the test in at least some settings (Table 4.2) *(4)*.

At the end of 2013, 78% (89 of 117) of low- and middle-income countries stated in the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) that their national HIV testing and counselling policy or guidelines recommended provider-initiated testing and counselling in all patient encounters, regardless of the presenting symptoms or type of facility (Table 4.2). Country studies suggest that provider-initiated counselling and testing (especially through antenatal clinics and in TB services) has had an especially strong effect on increasing HIV testing coverage *(15,16)*. Coverage exceeding 80% has been reported at antenatal care and TB clinics in some countries with a high burden of HIV infection, including Botswana, Ethiopia, Malawi, Uganda and Zimbabwe *(17)*. Provider-initiated testing and counselling is not yet a routine feature of other clinic services, however *(1)*.

Couples and partner HIV testing and counselling can potentially increase HIV testing among men and lead to stronger uptake of and adherence to ART and to interventions to prevent mother-to child transmission *(18)*. Methods as basic as couples-oriented, post-test HIV counselling have been shown to increase partner testing rates in countries as diverse as Cameroon, the Dominican Republic, Georgia and India *(4,19)*.

According to the WHO HIV Country Intelligence Database, by June 2014, close to half the 58 surveyed focus countries had adopted policies for couples testing and treatment of the partners living with HIV. However, few countries have achieved couples HIV testing and counselling rates exceeding 20% in antenatal care settings. Hindrances include male partners' perceptions that antenatal care services are not male-friendly, the often-conservative beliefs that many men have about gender roles and hierarchies and the facilities' lack of expectations and opportunities for fathers to participate in antenatal care visits *(20)*. In addition, fears of negative consequences that may stem from learning one's HIV status – including stigma, blame, physical abuse or partner separation – remain discouraging factors, especially for women *(21,22)*. Some studies have found a marked preference among women for individual versus couples HIV testing and counselling in antenatal care settings *(18)*.

Combining couples HIV testing with prevention, screening and treatment for other common causes of morbidity and mortality appears to be an attractive option. In a study conducted in Zambia, such combinations of services led to increased follow-up testing rates among couples, although overall testing rates remained low *(23)*.

Community-based testing is becoming more widespread, with 85 of 119 countries reporting that their national HIV testing and counselling policies support the provision of HIV testing by community services (Table 4.2). Community-based testing is highly acceptable and effective in reaching large numbers of first-time testers, diagnosing people living with HIV sooner after they acquire HIV infection and linking them to care *(24)*. WHO therefore recommends that community-based testing approaches complement provider-initiated testing and counselling. In addition, WHO recommends community-based HIV testing and counselling for key populations in all HIV epidemics, with linkage to prevention, care and treatment services *(25)*. HIV testing strategies in countries increasingly appear to recognize the specific needs of key and vulnerable populations: 100 of 119 countries reported that their HIV testing and counselling policies address adolescents, and 113 stated that these policies address key and vulnerable populations (Table 4.2).

Almost all countries (109 of 119) are offering rapid HIV testing with provision of results on the day of testing in at least some settings, and many (85 of 119) are drawing on community-based services. Door-to-door home-based testing, using rapid diagnostic tests, has been shown to increase the reach and uptake of HIV testing services in countries in the WHO African Region *(26)*. Home-based HIV testing and counselling led by lay counsellors significantly increased testing uptake by individuals and couples in a large study in a rural part of South Africa with high levels of HIV-related stigma *(27)*. A study in southern Zambia had similar findings *(28)*. Home-based testing may also be an effective method for encouraging more male partners of pregnant women to take HIV tests and for promoting uptake of services for preventing

Table 4.2. Policies and practices related to HIV testing and counselling in low- and middle-income countries, 2013

	National HIV testing and counselling policy or guidelines				
	Ensure provider-initiated testing and counselling in all patient encounters	Address HIV testing and counselling for key populations	Address HIV testing and counselling for adolescents	Support rapid testing with same-day results	Support HIV testing and counselling provided by community
Yes	89	113	100	109	85
No	20	5	14	7	28
Other	8	1	5	3	6
Countries reporting	117	119	119	119	119

Source: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS).

mother-to-child transmission. In a study in Kenya, the home-based model more than doubled the number of male partners who took an HIV test compared with an approach based at a health facility *(29)*.

Community campaigns that combine HIV testing and counselling with screening or prevention services for multiple diseases are also proving effective in the WHO Region of the Americas and the African Region. However, these may be expensive, and their long-term impact on linking with and uptake of the various services being offered should be carefully evaluated *(30)*. Other approaches being implemented include combining stand-alone sites, mobile outreach (including couples testing, testing in workplaces, schools and universities and accessible and safe venues for key populations), special testing events and campaigns, and self-testing (Box 4.2) *(4)*.

Service delivery approaches to HIV testing and counselling: a strategic policy framework (31) provides an overview of the diversity of HIV testing and counselling approaches and strategies.

Box 4.1. Supporting the right to know while protecting the right to say no

The shift towards provider-initiated testing and counselling has increased the numbers of people taking HIV tests, but there are concerns that many individuals may perceive such routine testing as being de facto mandatory *(5–7)*. In some surveys in African countries, many people who agreed to be tested said afterwards that they believed they could not have declined the test *(8)*. The apparent discordance between stated consent and a perceived inability to decline an offer of HIV testing has raised important questions about how to determine "genuine" consent.

However, a cross-sectional survey in Burkina Faso, Kenya, Malawi and Uganda found that retrospectively enquiring whether individuals could have refused to test for HIV tends to overestimate coercion and that individuals expressed agency even when reporting some pressure to test. The findings suggest that offering HIV testing at health facilities does not jeopardize informed consent *(5)*.

On the other hand, there continue to be reports of mandatory and coerced testing of some key populations (such as prisoners *(9)*, migrants (*10*) and ethnic minorities), including in clinical settings (*11*). Some countries, including Uganda, are pursuing new legislation supporting mandatory HIV testing for pregnant women and their partners *(12)*. In addition, some countries acknowledge that many HIV tests are performed in non-voluntary circumstances, such as pre-travel, pre-marriage or as part of screening prospective employees. WHO has reiterated its opposition to mandatory testing (*13*) and emphasizes that all forms of HIV testing and counselling should be voluntary and adhere to the "five C's": consent, confidentiality, counselling, correct test results and connections to care, treatment and prevention services *(4,14)*.

Box 4.2. HIV self-testing is gaining favour

HIV self-testing is showing considerable promise for reaching people who may otherwise not test for HIV. In this approach, a person tests himself or herself for HIV and interprets the result in private. Although experience with self-testing for HIV remains limited, it appears to be highly accurate *(32,33)* and acceptable *(4,34,35)*, especially among health workers and couples, and among key populations and other individuals who are at high risk of HIV infection or who require regular retesting *(33,36)*.

France, Hong Kong Special Administrative Region, Kenya, the United Kingdom and the United States of America have already developed policies on self-testing. Notably, the United States Food and Drug Administration in 2012 approved the sale and use of the first over-the-counter HIV self-test kit to meet current international standards *(37,38)*. Brazil, Malawi, South Africa and Zimbabwe are among other countries that are considering introducing or updating HIV self-testing policies.

Despite the potential of HIV self-testing, there are concerns about possible errors in performing the tests or interpreting the results *(25,39)* and about possible ethical and social risks associated with self-testing, especially the risk of emotional stress, intimate partner violence and misuse. However, these and other concerns have been raised for all forms of HIV testing and counselling, and no serious adverse events or harm involving HIV self-testing have been reported so far *(25,33)*. Nevertheless, reporting and monitoring systems for self-testing are not plentiful. Research is ongoing to gather more data from diverse settings before self-testing for HIV infection can be globally recommended and implemented *(32)*.

4.3 Linking of HIV testing to care and treatment needs to strengthen further

All HIV testing and counselling approaches should include effective methods for linking people who are diagnosed with HIV infection to prevention, care and treatment services *(4)*. However, the proportion of individuals who are lost to follow-up between HIV diagnosis and initiating ART remains high in many countries. A recent review of studies from the WHO African Region has found high rates of mortality and loss to follow-up from HIV diagnosis to ART initiation, especially among children. The main reasons include weak referral linkage; poor health-seeking behaviour; fear of stigma and discrimination; lengthy and unnecessary delays before initiating ART; shortages of health workers, especially in rural settings; and distances to be travelled to health facilities *(40)*.

Several approaches for improving pre-ART retention are showing promise. They include strengthening the community base of testing and treatment, reducing the number of clinic visits required, cutting waiting times at clinics (by streamlining work flows), using point-of-care CD4 testing and providing therapeutic services and other benefits (including free co-trimoxazole prophylaxis) as part of pre-ART care *(41–45)*.

When point-of-care CD4 cell count tests were used at four primary health clinics in Mozambique, loss to follow-up before initiating ART fell from 64% to 33%, and the proportion of enrolled people living with HIV who started ART increased from 12% to 22% *(46)*. Introducing more flexible staffing models could further increase the impact of point-of-care diagnostics on reducing loss to follow-up, increasing treatment initiation and, ultimately, increasing survival. Studies also show that integrating ART services in TB, maternal, newborn and child health, and opioid substitution therapy settings tends to improve treatment initiation in these populations *(47)*.

Chapter 5. CATALYSING HIV TREATMENT, CARE AND SUPPORT

Key Messages

Provision of ART accelerated further in 2013

The number of people receiving ART continued to rise rapidly in 2013. But ART for children is not expanding as quickly, and thus the treatment gap between children and adults continues to widen.

- About 12.9 million people were receiving ART globally at the end of 2013, 11.7 million of them in low- and middle-income countries. With an increase of 2 million people receiving ART, the growth in HIV treatment provision in 2013 was bigger than in any previous year.
- At current trends, the target of placing 15 million people on ART by 2015 in low- and middle-income countries might be exceeded.
- ART scale-up has resulted in a 25% drop in mortality from an estimated 2.0 million [1.8 – 2.1 million] in 2009 to 1.5 million [1.4 – 1.7 million] in 2013.
- Reaching the goal of treatment for all, however, remains a huge challenge. About 85% of all people living with HIV are eligible for ART, according to the treatment criteria in the 2013 WHO consolidated ARV guidelines.
- The 11.7 million people receiving ART in low- and middle-income countries represent only 36% [34–38%] of the estimated 32.6 million [30.7 – 34.8 million] people living with HIV in these countries.
- Treatment coverage for children lags: only 23% [21–25%] of all children (0–14 years) living with HIV are receiving ART. The provision of ART is expanding faster among adults than among children.
- Many adolescents are not accessing the HIV treatment system, and HIV has emerged as the second-largest cause of death among adolescents globally.
- Available data suggest that key populations with HIV continue to be underrepresented among people receiving ART even though their treatment access has improved.

5.1 Access to HIV treatment is expanding rapidly for adults

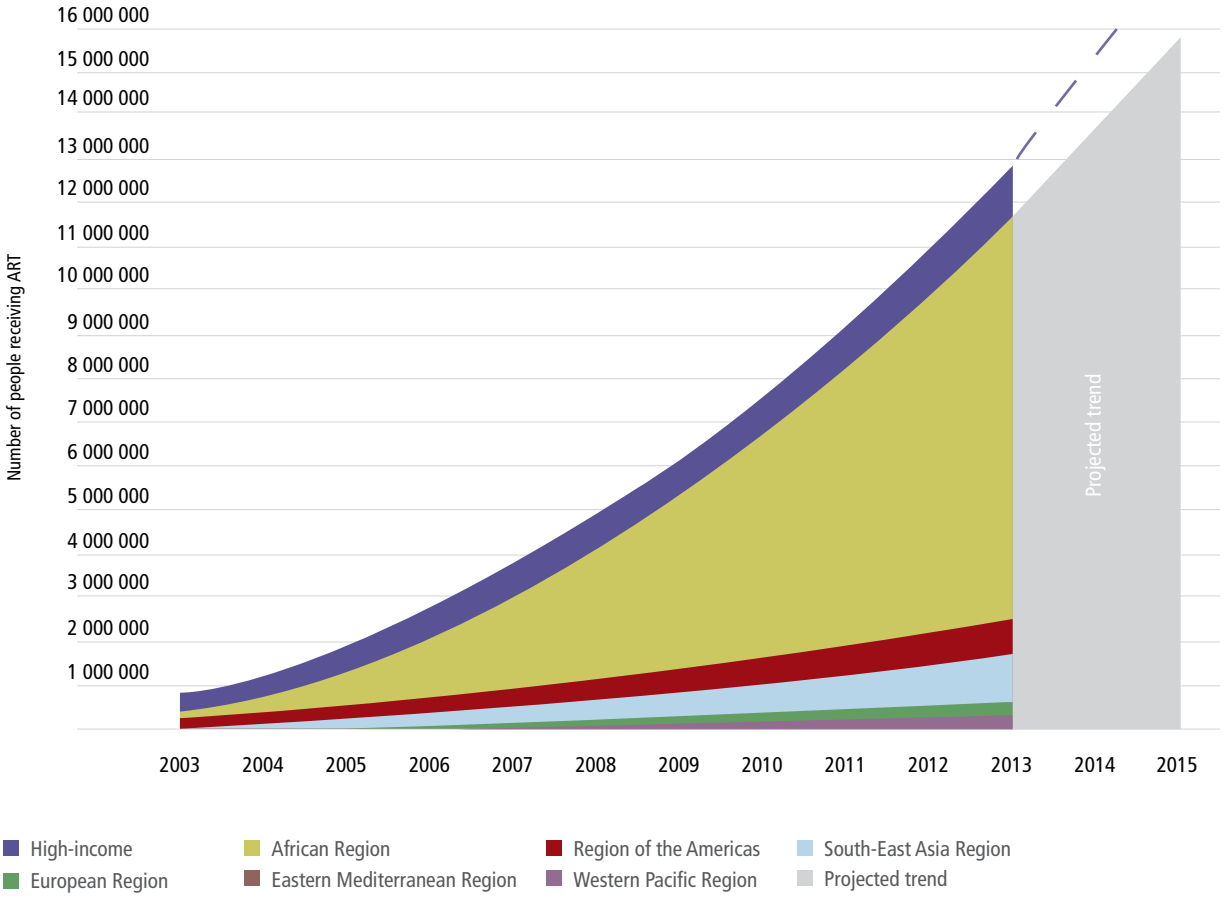
Access to ART continues to increase at a remarkable pace. At the end of 2013, 12.9 million people living with HIV were receiving ART globally, 11.7 million of them in low- and middle- income countries (Fig. 5.1).[1] In these countries, the number of people receiving ART rose by 2.0 million – 21% more than in 2012, and the largest annual increase ever.

This means that low- and middle-income countries remain on track to have 15 million people receiving ART in 2015 and may even exceed that target – a feat many observers deemed improbable when the target set was announced as part of the Political Declaration on HIV and AIDS: Intensifying Our Efforts to Eliminate HIV and AIDS in June 2011 *(2)*. These accomplishments show the political resolve of leaders, the community mobilization, the commitment of health care workers and managers, the technical innovation and the domestic and international funding that continue to power the global scaling up of ART.

Guiding the 15 million target was an assessment of ART needs based on the 2010 WHO guidelines on HIV treatment *(3)*. WHO revised the global consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection in 2013 *(4)*, calling for earlier treatment initiation and, for specific groups, treatment initiation regardless of immune status. As a consequence, it is estimated that as many as 85% of all people living with HIV would be eligible for ART under current WHO treatment guidelines *(5)*.

[1] For reasons of comparability and consistency, the country income categories refer to the World Bank classification *(1)* of countries that was valid when the United Nations General Assembly adopted the 2015 targets in 2011.

Fig. 5.1. Actual and projected numbers of people receiving antiretroviral therapy in low- and middle-income countries by WHO region and in high-income countries across WHO regions, 2003–2015[a]



[a]Country income classification by the World Bank at the time of the 2011 Political Declaration on HIV and AIDS.

Source: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS)

In 2013, an estimated 36% [34–38%] of the 32.6 million [30.7 – 34.8 million] people living with HIV in low- and middle-income countries were receiving ART.[2]

Although uptake of ART[3] has increased in every region, the proportion of people living with HIV enrolled in ART varies considerably between regions.

Most people receiving ART are in the WHO African Region, where 9.1 million people with HIV were getting ART at the end of 2013 (Fig. 5.2), up from 3.9 million in 2009 – a remarkable achievement. More than three quarters (78%) of all people receiving ART live in the African Region. The region is also home to almost two thirds (64%) of people living with HIV who are not receiving ART. Half of all people living with HIV who are not receiving ART live in just six countries, five of which are in the WHO African Region (Fig. 5.3).

The expansion of ART provision in the African Region grew even stronger in 2013. The number of people receiving ART in the Region increased by more than 1.5 million in 2013, compared with an increase of a little more than 1.3 million in 2012. An estimated 37% [35–39%] of people living with HIV in this region were receiving ART in 2013. Eastern and southern Africa continues to have higher ART coverage (41% of 7.7 million people living with HIV were receiving ART in 2013) than the western and central Africa subregion (22% of 1.3 million people living with HIV were receiving ART). This coverage gap appears to have grown in recent years.

In the low- and middle-income countries of the WHO European Region, only about 22% [19–25%] of people living with HIV were receiving ART at the end of 2013. However, the overall number of people receiving

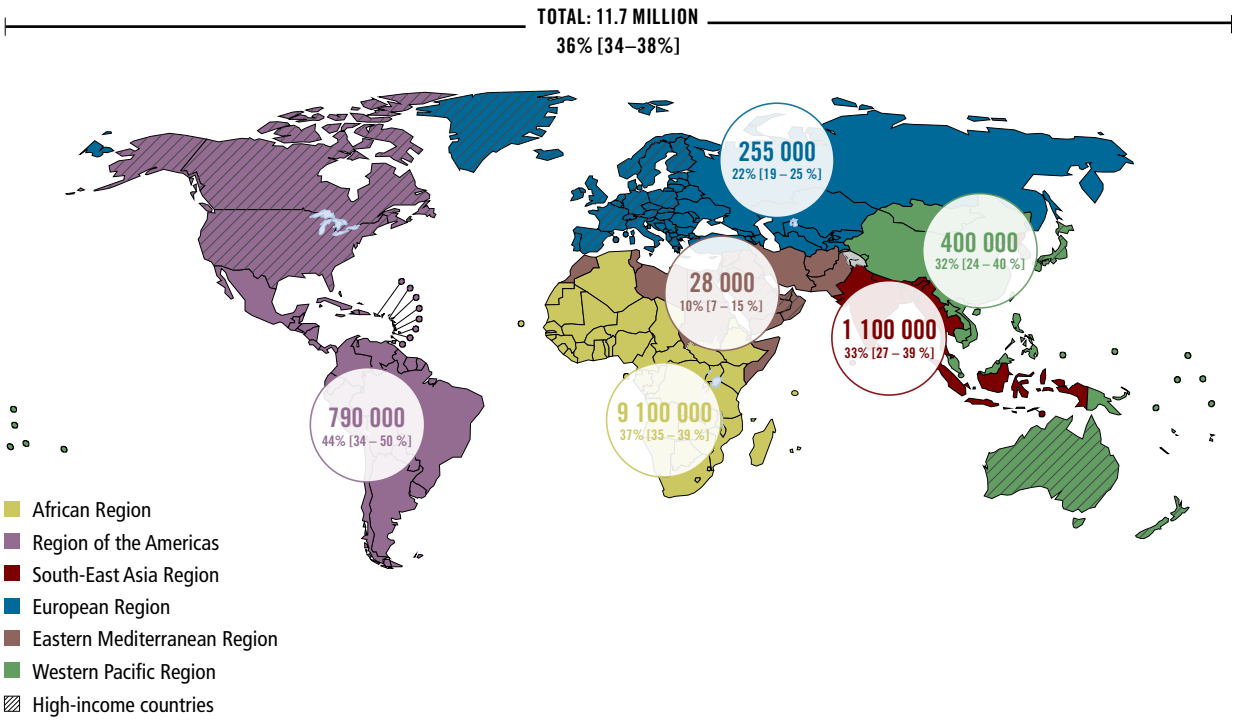
[2] In order to facilitate comparisons of access to ART following the changes in the 2013 WHO consolidated ARV guidelines, while recognizing that countries are at different stages of adapting their national treatment guidance, coverage of ART in this report is expressed in relation to the estimated total number of people living with HIV. In previous reports, ART coverage was expressed in relation to the number of people eligible for ART according to the WHO 2010 ART guidelines. That eligibility number was much smaller than the total number of people living with HIV, and coverage rates therefore were much higher than those cited in this report.

[3] The 12.9 million people receiving ART in all countries (including in high-income countries) represented 37% [33–39%] of the 35.0 million [33.1 – 37.2 million] people living with HIV globally.

treatment in the Region has more than doubled, from 109 000 in 2009 to 255 000 in 2013. Most people initiating ART in the eastern part of the Region received a WHO-recommended first-line regimen, and fixed-dose combinations of antiretroviral drugs were widely used. Most countries in the western part of the region have achieved high ART coverage rates.

In recent years, the WHO Eastern Mediterranean Region has been the region with the lowest access to ART, with a mere 10% [7–15%] of people living with HIV receiving ART. In response to persistent low coverage, WHO and UNAIDS in 2013 launched a regional initiative to end the HIV treatment crisis in the region, and health ministers are being urged to set more ambitious HIV treatment targets and to quickly develop and implement

Fig. 5.2. Number of people receiving ART and percentage of all people living with HIV receiving ART in low- and middle-income countries overall and by WHO region, 2013[a]



[a]Country income classification by the World Bank at the time of the 2011 Political Declaration on HIV and AIDS.

Source: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) and 2013 UNAIDS/WHO estimates.

acceleration plans. In 2013, the total number of people on ART increased by 29% in this region, compared with 2012, a positive sign that enrolment in ART is acquiring new momentum.

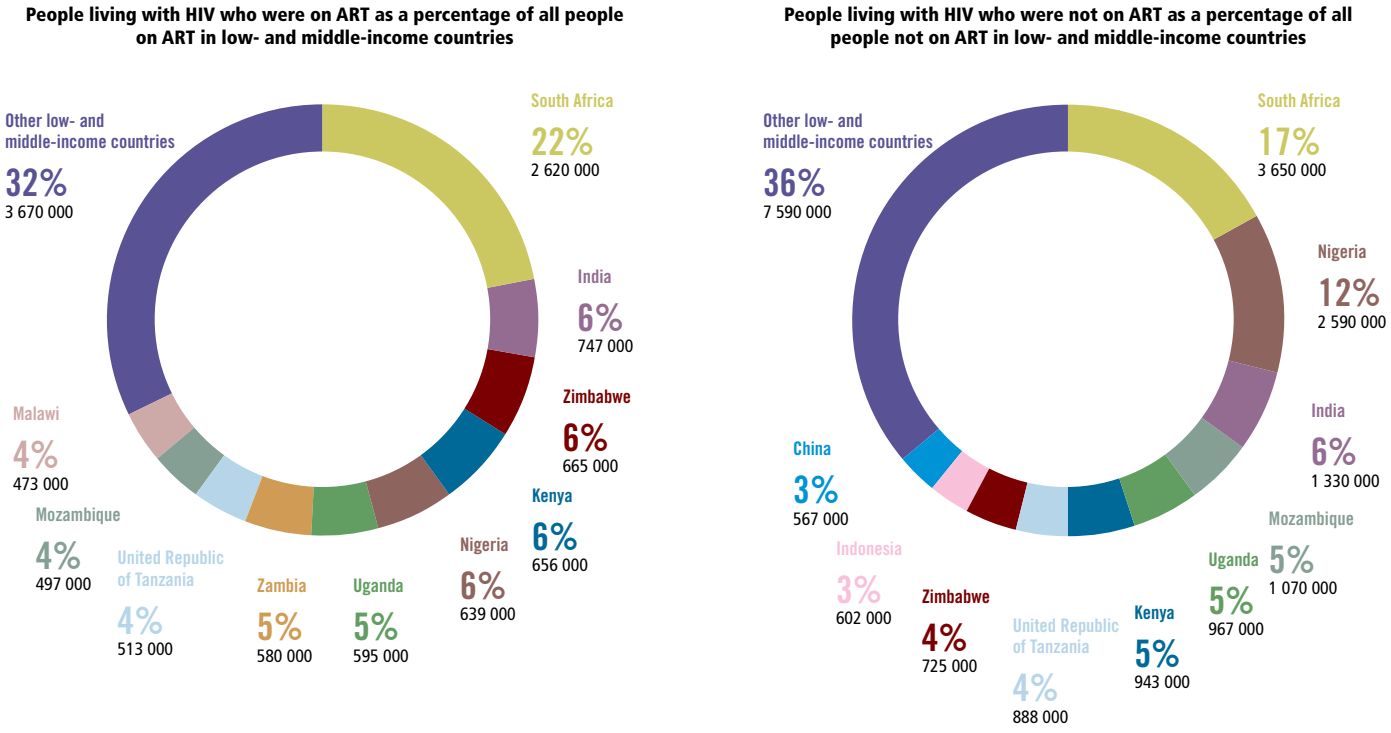
In the South-East Asia Region, an estimated 1.1 million people – or 33% [27–39%] of all people living with HIV – were receiving ART at the end of 2013, with the vast majority residing in India, Indonesia, Myanmar, Nepal and Thailand. The percentage of people with HIV receiving ART varied widely, however – from about 52% in Thailand to about 36% in India, 35% in Myanmar and only 11% in Bangladesh.

An estimated 400 000 people were receiving ART in the Western Pacific Region at the end of 2013. ART coverage across the region was estimated at 32% [24–40%] of all people living with HIV.

In the Region of the Americas, the number of people receiving ART approached 800 000 at the end of 2013, about 60 000 more than in 2012. With 44% [34–50%] of people living with HIV receiving ART, the Region of the Americas remains the region with the highest coverage of ART among low- and middle-income countries.

Despite the impressive global scaling up of ART, important disparities persist in access to ART. In most regions, including the African Region, men eligible for ART generally are less likely to be receiving it than women and are more likely not to be retained in care *(6)*. Limited available data also suggest that the improvements in access to treatment are not reaching enough children, adolescents (see below) and key populations who face a higher risk of HIV infection (including sex workers, people who inject drugs, men and transgender women who have sex with men) (see Chapter 7) *(7–9)*.

Fig. 5.3. Ten low- and middle-income countries with the largest numbers of people living with HIV who were receiving or who were not receiving ART, 2013



Source: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) and 2013 UNAIDS/WHO estimates.

Box 5.1. Countries are adopting new recommendations for earlier ART

The consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection released in mid-2013 reflect several recent scientific studies that demonstrate the important benefits of starting ART early to reduce mortality, morbidity and infection *(4)*. They recommend initiating ART earlier at CD4 cell count ≤500 cells/mm^3 or regardless of CD4 count. Immediate ART, regardless of CD4 cell count, is recommended for HIV serodiscordant couples, pregnant and breastfeeding women living with HIV, people with TB and HIV, people coinfected with HIV and hepatitis B infection with severe chronic liver disease and children living with HIV who are younger than five years-old. The new guidelines also promote using more effective, less toxic and simpler regimens and recommend adopting a single first-line regimen for all adults and adolescents living with HIV (tenofovir (TDF) + lamivudine (3TC) or emtricitabine (FTC) + efavirenz (EFV)). First-line ART should ideally be provided as a fixed-dose combination, which improves adherence and simplifies prescribing *(10)*.

According to the WHO HIV Country Intelligence Database, by June 2014, 28 of 58 surveyed WHO HIV focus countries had adopted at least one of the major clinical components of the 2013 guidelines (ART for adults, ART for children and/or services to prevent mother-to-child transmission), and another 25 countries were in the process of doing so. Notably, 23 of the focus countries have adopted a CD4 cell count level of ≤500 cells/mm^3 as the threshold for initiating ART, and 45 have moved to TDF + 3TC (or FTC) + EFV as the preferred first-line regimen (Table 5.1).

Table 5.1. Policies on initiating ART in 58 WHO HIV focus countries, by WHO region, 2014

CD4 cell count ≤350 cells/mm³	CD4 cell count ≤500 cells/mm³
African Region: Angola, Botswana, Burundi, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Democratic Republic of the Congo, Ghana, Kenya, Lesotho, Malawi, Mozambique, South Africa, Swaziland	African Region: Ethiopia, Namibia, Nigeria, Rwanda, South Sudan, Uganda, Zambia, Zimbabwe
Region of the Americas: Dominican Republic, Jamaica, Paraguay	Region of the Americas: Bolivia (Plurinational State of), Brazil, Ecuador, El Salvador, Guatemala, Haiti, Honduras
Eastern Mediterranean Region: Iran (Islamic Republic of), Libya	Eastern Mediterranean Region: Yemen[a], Sudan, Pakistan, Morocco, Djibouti
European Region: Kazakhstan, Kyrgyzstan, Russian Federation, Tajikistan, Ukraine	European Region: Uzbekistan
South-East Asia Region: Indonesia, Myanmar, Nepal, Thailand	South-East Asia Region: India
Western Pacific Region: Cambodia, Papua New Guinea, Philippines, Viet Nam	Western Pacific Region: China

[a]Policy to provide ART to people living with HIV regardless of CD4 cell count

Source: WHO HIV Country Intelligence Database, as of June 2014.

5.2 People are starting ART earlier

ART scale-up has resulted in a 25% drop in HIV mortality in recent years – from 2.0 million [1.8 – 2.1 million] in 2009 to 1.5 million [1.4 – 1.7 million] in 2013. A clear shift is underway toward initiating ART earlier. The median CD4 cell count when ART is started has been rising in all WHO regions (and especially among women in several of them) – an improvement that stems from greater uptake of HIV testing and counselling and strengthened links between HIV diagnosis and initiating ART.

- A recent multicohort analysis spanning six continents found that median CD4 cell counts at ART initiation rose between 2002 and 2009 in most of the countries studied, although the increases were modest in low-income countries *(11)*.

- Data from 13 countries in Asia show median CD4 cell counts at ART initiation rising from 115 cells/mm³ in 2008 to 302 cells/mm³ in 2011. However, 36% of the people living with HIV were still starting ART late in 2011 *(12)*.

- Another recent analysis of data from eastern and southern Africa has shown steady reductions in the proportions of people starting ART with CD cell counts <100 cells/mm³: from about 42% to 29% between 2006 and 2011. The median CD4 cell counts, however, were still <200 cells/mm³ in 2011 *(13)*.

Overall, however, about one in four people in low-income settings overall initiate ART late, with CD4 counts <100 cells/mm³, according to cohort data from almost 380 000 people across all WHO regions. Generally, men are more likely to begin treatment late than women *(11)*. In the WHO European Region, an estimated 50% of people with newly diagnosed HIV infection present for testing with CD4 cell counts <350 cells/mm³, and no marked improvement in earlier diagnosis has been observed since 2010 *(14)*.

Starting ART early is vital for successful treatment outcomes. In a study conducted in the United Kingdom, presentation for treatment with a CD4 cell count of less than 350 cells/mm³ was the most important predictor of dying of AIDS, with 60% of all-cause mortality and 81% of HIV-related deaths attributable to such late diagnosis *(15)*. Even seemingly minor delays acquire critical importance. Data from three treatment cohorts in South Africa showed that when people living with HIV presented with a CD4 cell count between 50 and 100 cells/mm³, a 10-week delay in starting ART was associated with a relative increase of 34% in mortality (from 11% to 15%) *(16)*.

Conversely, significant increases in the median CD4 cell count of people starting ART tends to be associated with steep drops in early mortality among them. In a study among 19 000 people receiving ART in South Africa's KwaZulu-Natal province, a rise in median CD4 cell counts

was accompanied by a 46% decrease in early mortality among people starting ART in 2011–2012 compared with 2008–2009 *(17)*.

People living with HIV start ART late when they either do not take HIV tests or discover their serostatus but are not retained in care until they become eligible for treatment in accordance with WHO guidelines. Indeed, many adults and children are still dropping out of care at various points along the treatment cascade, from HIV diagnosis to long-term retention in care *(18–21)*.

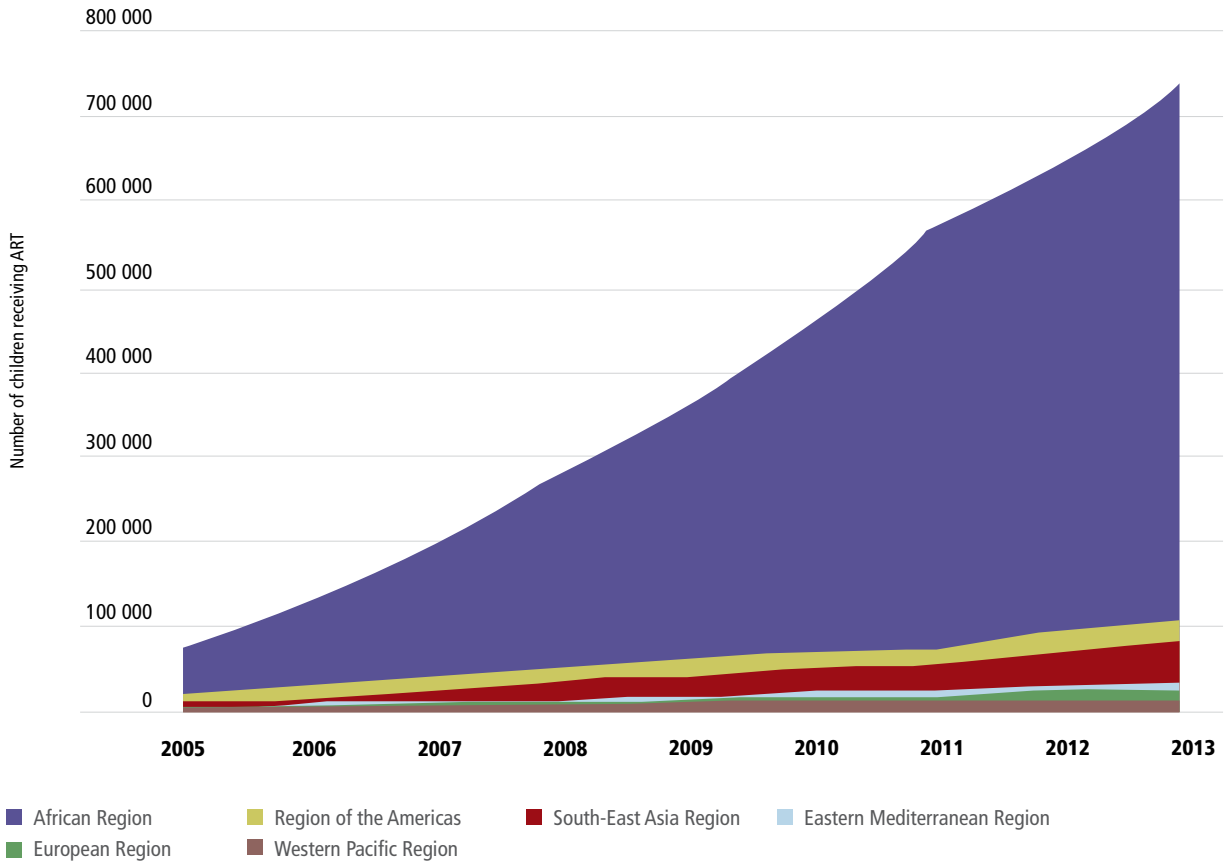
Several approaches for improving pre-ART retention are showing promise, however. They include reducing the number of clinic visits that are required to monitor people's disease status, cutting waiting times at clinics, using point-of-care CD4 testing and providing therapeutic services and other benefits (including co-trimoxazole prophylaxis free of user charges) as part of pre-ART care *(22–25)*.

Easier, and more affordable and reliable access to HIV treatment also appears to improve retention. In Chennai, India, for example, delays between HIV diagnosis and ART initiation were substantially reduced as the use of generic ARV drugs increased and the rollout of free ART progressed *(26)*. However, data from high-income countries suggest that shifts towards initiating ART earlier are neither automatic nor self-sustaining *(27)*. Sustained use of innovative strategies is needed to identify people early in the course of HIV infection and to link them promptly to care.

5.3 HIV treatment for children is expanding – but not quickly enough

Although services for preventing mother-to-child transmission are expanding and improving, large numbers of infants continue to be exposed to HIV: globally, almost 1.5 million [1.3 million–1.6 million] pregnant women were living with HIV in 2013. Identifying the infants and children who have acquired HIV and linking them to treatment and care therefore remains vitally important. The number of children (younger than 15 years) receiving ART in low- and middle-income countries more than doubled from 2009 to 2013, from 355 000 to 740 000 (Fig. 5.4).

Fig. 5.4. Number of children (younger than 15 years) receiving ART in low- and middle-income countries by WHO region, 2005–2013

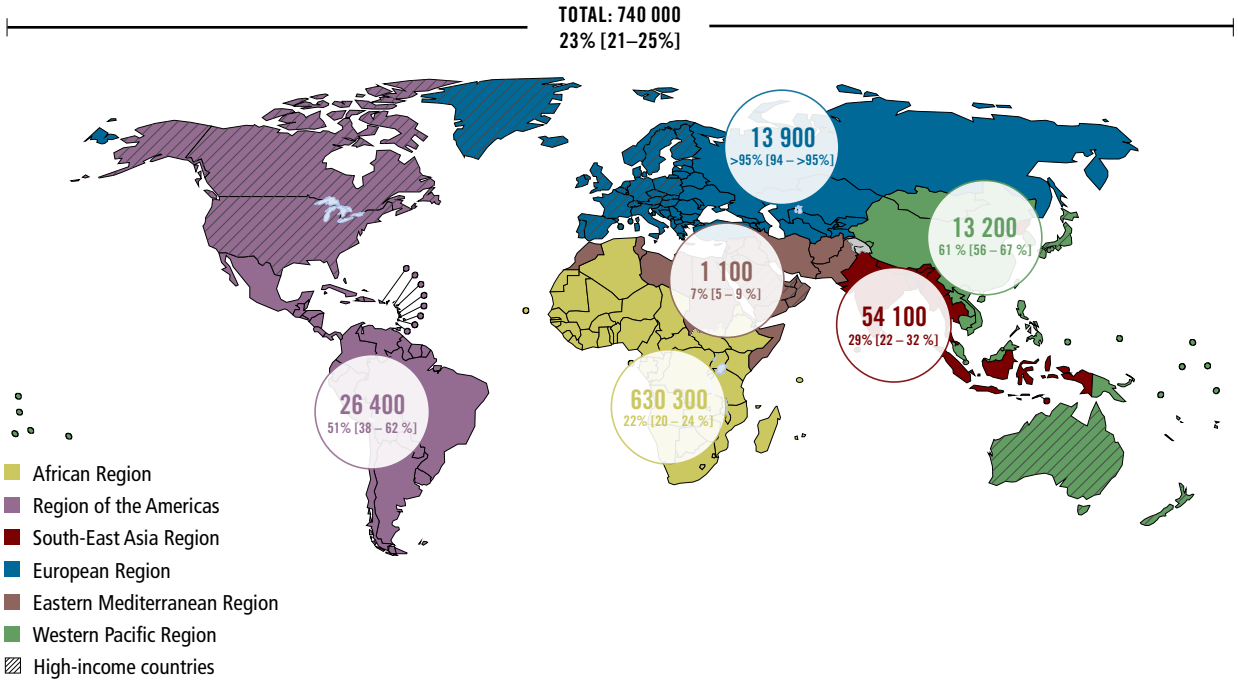


Source: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS).

The WHO 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection recommend that all children living with HIV younger than 15 years receive ART; for children older than five years, the criteria for initiating ART are the same as for adults *(4)*.

At the end of 2013, less than one quarter (23%, range 21–25%) of children living with HIV were receiving ART in low- and middle-income countries (Fig. 5.5) compared with more than one third (37%, range 35–39%) of adults living with HIV. This reflects a persistent and significant ART coverage gap between children and adults. The number of children receiving ART increased by about 15%, from 640 000 in 2012 to 740 000 in 2013, less than the increase in the number of adults receiving ART (which rose from 9.1 million in 2012 to 10.9 million in 2013, equivalent to a 20% increase). ART coverage for children is not expanding at a sufficient pace to close the treatment gap between adults and children in the foreseeable future.

Fig. 5.5. Number of children receiving ART and percentage of all children living with HIV receiving ART in low- and middle-income countries by WHO region, 2013[a]



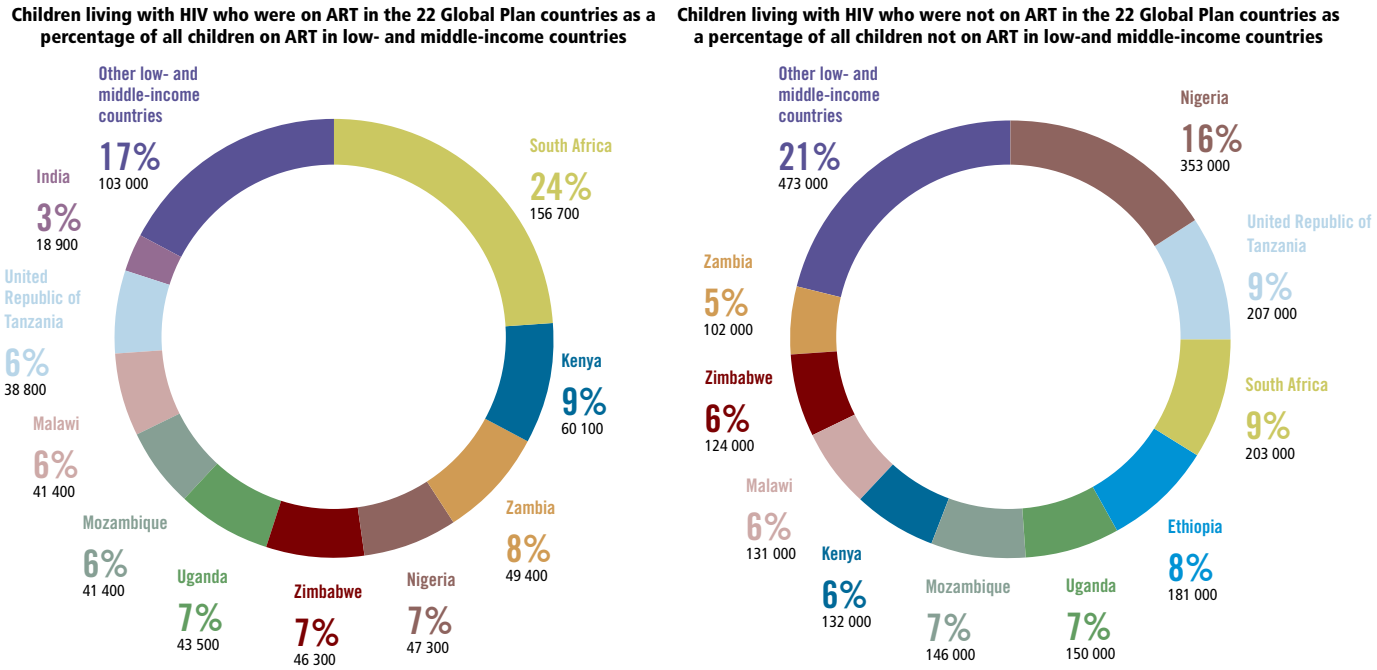
[a]Country income classification by the World Bank at the time of the 2011 Political Declaration on HIV and AIDS.

Source: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) and 2013 UNAIDS/WHO estimates.

Developments in the 22 priority countries for the Global Plan towards the elimination of new HIV infections among children by 2015 and keeping their mothers alive are especially important, since these countries are home to almost 90% of all children living with HIV. Except for India, all of these countries are in the WHO African Region, in which 22% [20–24%] of all children living with HIV were receiving ART at the end of 2013. Among these countries, Namibia, South Africa and Swaziland have made significant progress in increasing ART coverage for children, enrolling close to 50% of the children living with HIV on ART, but they are yet to emulate the >80% coverage achieved in Botswana. The progress has been achieved largely with dynamic programmes for preventing mother-to-child transmission, improved early infant diagnosis and decentralization of paediatric ART services. The remaining treatment gaps are now concentrated in a few countries with large numbers of children living with HIV who are not receiving ART (Fig. 5.6).

An estimated 190 000 [170 000–250 000] children were living with HIV in the WHO South-East Asia Region at the end of 2013, the vast majority in India. Overall, the Global AIDS Response Progress Reporting shows that about 54 000 or 29% [22–32%] of the children living with HIV in this region were receiving ART in 2013, with coverage ranging from 62% in Thailand and 43% in Myanmar to 30% in India and 21% in Bangladesh. In the WHO Western Pacific Region, about 13 200 children younger than 15 years were receiving ART in 2013 – about 61% [55–67%] of the estimated 21 000 [20 000–24 000] children living with HIV in that region. In the WHO Region of the Americas, 51% [38–62%] of the estimated 52 000 [42 000–70 000] children living with HIV were receiving ART. Much smaller numbers of children are living with HIV in the WHO European and Eastern Mediterranean Regions, but ART coverage among them in 2013 differed widely – from more than 95% in the European Region to a mere 7% [5–9%] in the Eastern Mediterranean Region.

Fig. 5.6. Number of children living with HIV who were receiving or were not receiving ART in the 22 priority countries of the Global Plan, 2013



Source: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) and 2013 UNAIDS/WHO estimates.

Overall, greater progress is possible, including in resource-constrained settings, as shown in Botswana, where most children living with HIV are receiving ART. The 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection *(4)* recommend initiating ART immediately for all children younger than five years who are diagnosed with HIV, irrespective of CD4 cell count. As of June 2014, WHO's HIV Country Intelligence Database showed that 21 of 58 focus countries had adopted such a policy (Table 5.2). A few countries (including Ethiopia, Namibia and Zambia) are considering providing treatment to all children living with HIV younger than 15 years, and the Russian Federation and Uganda have already begun implementing this *(28)*. WHO does not currently promote this approach but is encouraging monitoring of the policy's outcomes to inform possible changes to future recommendations.

Numerous factors affect the delivery of timely, effective ART for children. Early infant diagnosis, although expanding, is available mostly in urban areas, and elsewhere it tends to involve significant delays *(29)*. According to the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS), only 42% of HIV-exposed infants in the 22 Global Plan priority countries received timely virological testing in 2013, and coverage was less than 5% in two of these countries.

Linking infants diagnosed with HIV to care remains a challenge, and new efforts are needed to achieve timely initiation of ART *(30)*. Elsewhere, the lack of universal provider-initiated testing and counselling in settings with concentrated epidemics (especially places such as hospital children's wards or malnutrition clinics) hinders the effective identification of HIV cases *(31,32)*. Recently published evidence from Malawi *(33)* indicates that routine HIV counselling and testing of hospitalized children at health facilities could be more effective than community-based testing for identifying infants with more severe, rapidly progressing disease.

Additional challenges include hesitancy among non-specialized health care workers in dealing with HIV among children, limited availability of fixed-dose combinations and a lack of a palatable formulation suitable for young children and infants. Market fragmentation also makes it difficult for national HIV programmes to procure ARV drugs for children in ways that can ensure reliable supply chains. Significant improvements are needed also to boost the impact of new products, including efforts to simplify and harmonize treatment recommendations and tools for streamlining the ARV drugs for children (Boxes 5.2 and 5.3).

When children with HIV are diagnosed early enough and linked to care, good outcomes can be achieved. A recent report from China's national ART programme for children, which is free of user charges, showed that almost all (94%) the children enrolled in the programme were still receiving ART three years after starting it. The high retention in care has been attributed to China's household registration system and to robust systems for tracking and following up people on ART *(34)*.

Table 5.2. Policies on initiating ART among children diagnosed with HIV adopted in the 58 WHO HIV focus countries

ART for all children with HIV <2 years	ART for all children with HIV <5 years	Other policies
African Region: Burundi, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Democratic Republic of the Congo, Ghana, Kenya, Namibia, Nigeria, United Republic of Tanzania	African Region: Botswana, Lesotho, Malawi, Mozambique, Rwanda, South Africa, South Sudan, Zambia, Zimbabwe	African Region: Angola, Ethiopia, Swaziland, Uganda
Region of the Americas: Bolivia (Plurinational State of), Dominican Republic, Ecuador	Region of the Americas: Honduras, Jamaica, Paraguay	Region of the Americas: Brazil, Guatemala
Eastern Mediterranean Region: Iran (Islamic Republic of), Somalia	Eastern Mediterranean Region: Pakistan, Yemen	Eastern Mediterranean Region: Morocco
European Region: Kazakhstan, Tajikistan	European Region: Kyrgyzstan	European Region: Russian Federation, Ukraine, Uzbekistan
South-East Asia Region: Myanmar, Nepal	South-East Asia Region: India, Indonesia	South-East Asia Region: Thailand
Western Pacific Region: Papua New Guinea, Viet Nam	Western Pacific Region: Cambodia, China	Western Pacific Region: Philippines

Source: WHO HIV Country Intelligence Database, as of June 2014.

Box 5.2. Improvements that can enhance HIV treatment for children

WHO and its partners spearheaded several initiatives in 2013 to enhance ART for children. WHO and UNICEF updated the optimal list of paediatric ARV formulations, reducing the optimal drugs and formulations in that list to 10 *(37)*. In addition, the Paediatric Antiretroviral Drug Optimization Conference in October 2013 identified medium- and long-term priorities for the development of drugs and formulations for infants and children. Also underway are activities to gather pharmacokinetic data and enable the development of fixed-dose combinations for first-line regimens for children aged 0–3 years and 3–10 years, with new formulations expected to become available soon.

WHO recently conducted a technical review to improve guidance on early diagnosis of HIV infection among infants and young children. Innovations being considered for improving case identification and speeding up linkage to care and treatment include new diagnostic platforms (that can be positioned close to the point of care) and new strategies to optimize the timing of testing for HIV-exposed infants and children *(38)*.

In a joint effort with UNICEF and other partners within the Interagency Task Team on the Prevention and Treatment of HIV Infection in Pregnant Women, Mothers and Children, WHO has also promoted the double dividend as a framework for accelerating progress towards the dual goals of improving child survival and closing the gap in HIV and AIDS among children. Fostering integration and collaboration between HIV and maternal, newborn and child health programmes is considered to be critically important for reaching the common goal of improving maternal and child outcomes *(39)*.

Box 5.3. Taking full advantage of treatment options

Co-trimoxazole prophylaxis is vital for increasing survival among HIV-exposed and HIV-infected children *(40)* and has been recommended since 2006 *(41)* as an essential component of the HIV care package.

A total of 517 000 HIV-exposed infants in the low- and middle-income countries that reported these data received co-trimoxazole in 2013. Substantial increases in the number of children receiving co-trimoxazole were reported in a few countries with high burdens of HIV, including Cameroon, Malawi and Mozambique. India provided co-trimoxazole to more than 6000 infants in 2013, a significant improvement over previous years. However, overall less than half of HIV-exposed infants are started on co-trimoxazole before reaching two months age. For many countries in all regions, the numbers of children receiving this treatment remained steady or decreased in 2013, which indicates that stronger efforts are required to increase coverage of this feasible, well-tolerated, cost-effective and life-saving intervention for children with HIV.

WHO recently revised recommendations for the use of co-trimoxazole prophylaxis among children, adolescents and adults living with HIV. The new guidance recognizes the additional role of co-trimoxazole prophylaxis in reducing morbidity – even in the context of effective scaling up of ART and especially in settings with high prevalence of malaria and severe bacterial infections *(42)*. The updated recommendations will be published in the forthcoming supplement to the WHO consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection *(4)*, which is due in the second half of 2014.

Models for delivering HIV services for children have relied heavily on providing specialized, centralized care delivered by specialists or doctors in HIV clinics for children or adults. However, as with HIV care and treatment generally, there are substantial advantages in decentralizing ART for children and providing it at the same sites and with the same providers as other primary health services in settings with substantial need for treatment for children. A study of more than 17 000 children enrolled in HIV care at 274 public facilities in Kenya, Lesotho, Mozambique, Rwanda and the United Republic of Tanzania found that when HIV care for children was decentralized into primary health care centres, the numbers of children receiving ART increased, and the rates of loss to follow-up and mortality declined compared with the services at secondary and tertiary facilities *(35)*. In addition, according to a recent systematic review *(36)*, task shifting ART delivery for children from specialists to non-physicians can result in outcomes comparable to routine physician care and should be a priority for improving access (see Chapter 9).

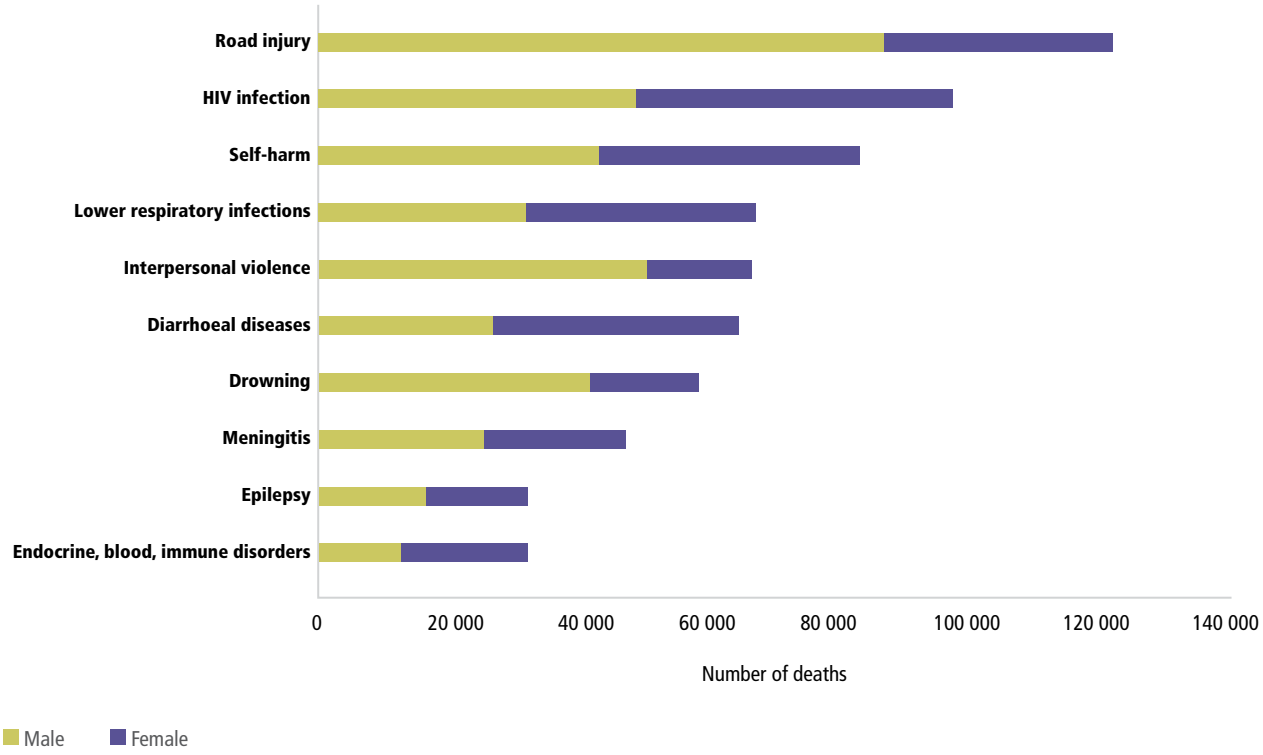
5.4 Adolescents are not benefiting enough from the expansion of treatment

An estimated 2.1 million adolescents (10–19 years of age) globally were living with HIV in 2012 *(43)*. The proportion of adolescents eligible for ART according to WHO guidelines who are receiving ART overall has not been reliably estimated. However, specific studies in Malawi, Uganda, the United Republic of Tanzania and Zimbabwe have indicated that adolescents' uptake of treatment is often lower than for other age groups *(44,45)*. Further, a substantial increase in HIV-related deaths among adolescents indicates the inadequacy of current ART services for this age group. Globally, HIV is now believed to account for the second largest number of deaths among adolescents (Fig. 5.7) *(46,47)*.

Uptake of testing among adolescents is low, even in countries with a high prevalence of HIV infection. Population-based survey data from 2006 to 2012 in the WHO African Region indicate that fewer than one in five adolescent girls and an even smaller proportion of adolescent boys (15–19 years old) were aware of their HIV status (Fig. 5.8) *(47)*. In other regions, although data are scarce, reported access to and uptake of HIV testing and counselling by adolescents consistently appears to be lower than for many other age groups. Consequently, many adolescents living with HIV do not know that they have acquired HIV.

HIV programmes generally struggle to reach and retain adolescents and tend to lack adolescent-friendly services *(49,50)*. This is especially the case for adolescents from key populations, who are more vulnerable to abuse, stigmatization and exclusion than other adolescents and who are believed to experience poor access to HIV (and other health) services because of social and

Fig. 5.7. Top 10 causes of death among adolescents globally, by sex, 2013



Source: Health for the world's adolescents *(48)*.

legal barriers. However, data describing adolescent key populations' access to HIV services (especially ART) are limited *(51,52)*.

Linking individuals living with HIV to clinical care early is essential to take full advantage of the treatment and prevention benefits of ART. Compared with adults, adolescents living with HIV are more likely to be identified later in the course of HIV infection and to delay entry into clinical care. Late diagnosis of HIV infection is a particular issue for adolescents from key populations, who are often reluctant to seek services because of stigma, discrimination and the possibility of punitive consequences. In addition, HIV testing and counselling services do not always meet their needs for special services and support.

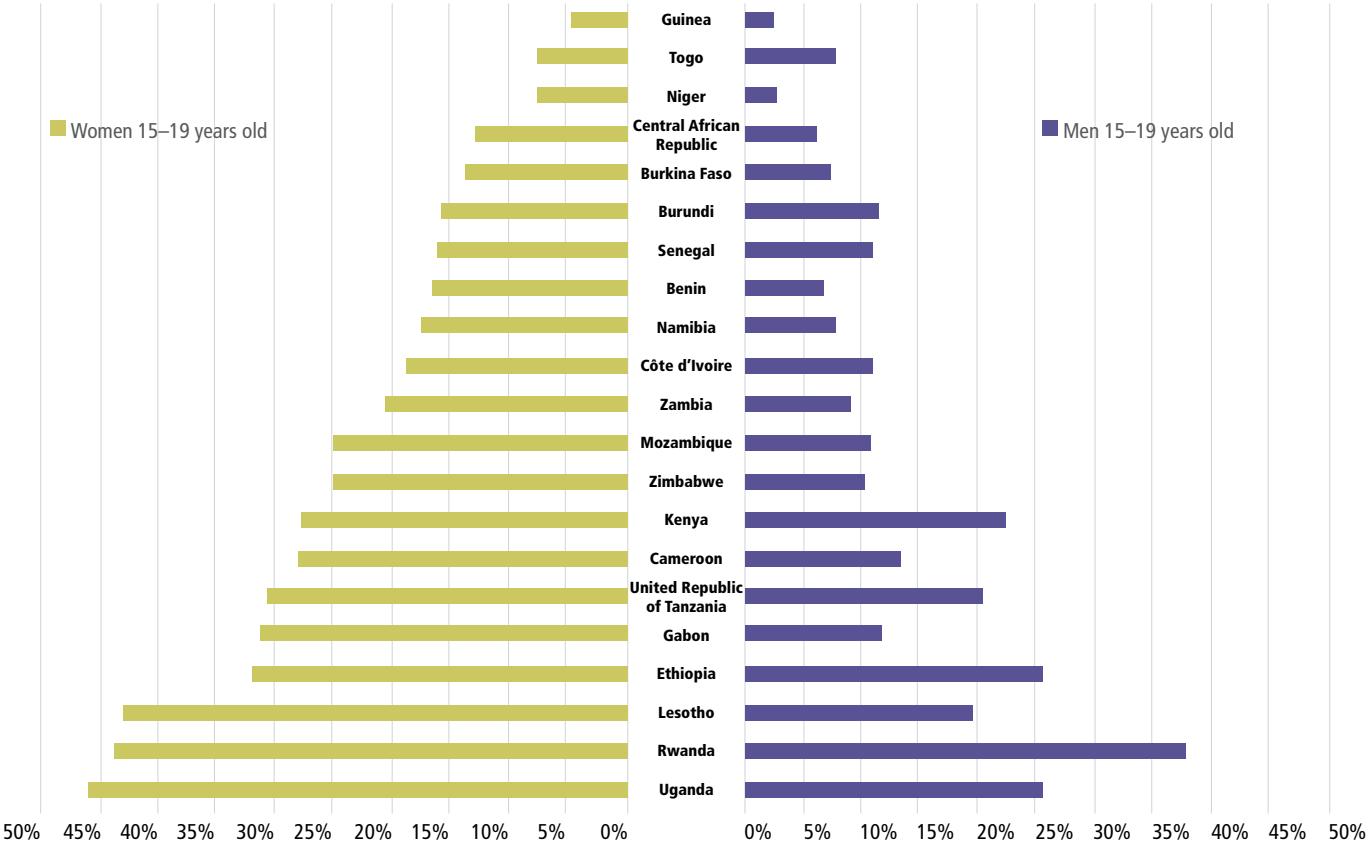
Adherence to ART has been shown to be the single-most important factor in achieving viral suppression among young people living with HIV. Nevertheless, many adolescents encounter special difficulties in adhering to treatment. Some studies show that the adolescents living with HIV who start ART are more likely to drop out of care and have lower viral suppression rates than both adults and younger children *(53,54)*. A recent systematic review of data from 53 countries *(55)* found that 62% of the adolescents and young adults receiving treatment were at least 85% adherent to ART.[4] In addition, a recently published cohort study at 160 HIV clinics in Kenya, Mozambique, Rwanda and the United Republic of Tanzania *(56)* found that attrition rates both before and after ART initiation were substantially higher among people 15–24 years old than for other age groups.

Indeed, adherence poses unique challenges for adolescents. For example, they may refuse to take medication as part of otherwise normal efforts to assert their autonomy. Adolescents living with HIV have cited depression, a lack of parental and social support, regimen fatigue, side effects, weak health care systems, a lack of youth-friendly services, and misinformation as the main barriers to ART adherence *(57–59)*. Stigmatization and harassment may further comprise adherence for adolescents from key population groups.

These factors can be improved. Reviewing laws and policies on consent to services are and incorporating more tailored approaches for adolescents in national HIV responses may reduce some of the hindrances. The adjustments would include giving appropriate priority to adolescents in national HIV strategies and making available youth-friendly HIV testing and counselling and treatment services (Box 5.4). Improvements can start by involving adolescents more closely in developing services that better match their

[4] Adherence to ART in the studies was measured by subjective measurement (self-reported adherence), pharmacological measurements (pill count, pharmacy refill records) or physiological methods (viral suppression).

Fig. 5.8. Percentage of women and men 15–19 years old who have ever been tested for HIV and received the results, selected countries (based on data availability) in the WHO African Region, 2006–2012



Source: Adapted from: Towards an AIDS-free generation: children and AIDS – sixth stocktaking report, 2013 *(47)*.

Box 5.4. WHO's recommendations for HIV testing and counselling for adolescents

The guidelines WHO published in 2013 on HIV testing and counselling and care for adolescents living with HIV propose a comprehensive range of strategies for scaling up HIV testing and counselling for adolescents and strengthening linkage to care *(43)*. They recommend that all adolescents in generalized epidemics, as well as adolescents from key populations in concentrated or low-level epidemic settings, should be offered HIV testing and counselling with linkage to prevention, treatment and care. In addition, WHO recommends that:

- HIV testing and counselling, with linkage to prevention, treatment and care, be made accessible to all adolescents in low-level and concentrated epidemics;
- adolescents be counselled about the potential benefits and risks of disclosing their HIV status to others and should be empowered and supported to decide when and how they disclose;
- community-based approaches can be used to improve treatment adherence and retention in care for adolescents living with HIV; and
- health care workers receive training to enhance treatment adherence and improve retention in care for adolescents living with HIV.

An interactive tool has been developed to accompany the WHO guidance. It supplements the formal guidelines with practical guidance for reaching adolescents with more appropriate, appealing and effective HIV services *(64)*.

special needs and circumstances *(53)*. In the four-country study cited above, attrition was considerably lower for adolescents and young adults who attended clinics that provided sexual and reproductive health services (including condoms) or that had adolescent support groups *(56)*.

Other necessary improvements include transitioning adolescents who are in treatment and care programmes into services that are more appropriate for their age-related needs and circumstances. In some high-prevalence settings, an increasing number of adolescents who acquired HIV perinatally remain undiagnosed for many years *(60)*: it is estimated that more than one in three infants living with HIV have slow-progressing infection, with a median survival of 16 years without treatment *(61)*. However, estimates of survival in the WHO African Region are lower. Untreated infants living with HIV in the African Region have an estimated 20–30% probability of surviving to at least their tenth birthday *(62,63)*. Many children infected with HIV during infancy therefore present for treatment for the first time as adolescents and with mounting health problems. As more children and adolescents living with HIV survive into adulthood, the transition of these young people into adult care is emerging as an overlooked priority *(64)*.

Examples of successful provision of comprehensive and supportive HIV prevention, treatment and care services for adolescents need to be documented more frequently, so that good practices can be shared and replicated.

5.5 HIV treatment for key populations needs to expand and improve

The HIV epidemic disproportionately affects certain key populations, especially sex workers, men who have sex with men, transgender people and people who inject drugs. In many settings, prisoners and detainees, refugee populations, ethnic minorities, migrants and mobile workers are also at higher risk of HIV infection. However, very few data describe access to ART in these populations. Data relating to prisoners and detainees, refugee populations, migrants and mobile workers are often not integrated into general service data. In addition, there are human rights concerns about categorizing people who receive ART as members of specific key populations in the many countries that criminalize and stigmatize the behaviour associated with those populations.

Nevertheless, it is evident that key populations encounter formidable barriers in accessing health services generally and HIV services specifically. In many parts of the world, they are likely to face systematic exclusion along with both social and institutionalized stigma, discrimination and harassment *(65)*.

Globally, about 1.7 million [0.9 million – 4.9 million] of the estimated 12.7 million [9.0 million – 22.4 million] people who inject drugs globally are believed to have acquired HIV *(66)*. However, current reporting systems generally do not monitor how many of them are enrolled in ART programmes. Countries in the WHO European Region are an exception, with many enquiring about the mode of HIV transmission among people receiving ART. The WHO Regional Office for Europe has been monitoring access to HIV treatment for people who inject drugs since 2002 by comparing the share of people who inject drugs among all people diagnosed with HIV, based on HIV case reporting, and the share of people who inject drugs among those enrolled in ART *(67)*. Such data show that, although inequities in access appear to be decreasing over time, people who inject drugs continue to be underrepresented among people receiving ART (Fig. 5.9).

Indeed, many of the factors that put people who inject drugs at great risk of HIV infection also impede their ability to access and remain on HIV care and treatment – including stigma and discrimination in both health care settings and wider communities, and punitive laws and practices (see Chapter 7).

People belonging to key populations and who may need ART are often unaware that they have acquired HIV, since few HIV counselling and testing services are available or are tailored for them (Box 5.5). Late HIV diagnosis is therefore common *(68)*, and many people who inject drugs and test HIV-positive start ART with advanced clinical disease or very low CD4 cell counts *(69)*. In addition, some countries require that people undergo compulsory drug detoxification before they can access ART, which delays and even deters access to treatment *(70)*. People who do manage to access ART have to navigate additional barriers including a lack of quality adherence counselling, effective support or follow-up plans and lack of access to opioid substitution therapy *(71)*.

There have been encouraging developments, including in countries where there continue to be human rights concerns surrounding people who inject drugs. Viet Nam's national ART programme largely focuses on providing treatment to people who inject drugs. In Ho Chi Minh City, for example, 73% of the people receiving ART report a history of injecting drug use – which implies fairly equitable treatment coverage for this key population *(29)*. An evaluation of the first five years of Viet Nam's ART programme has shown fairly good retention rates: 88% at 6 months, 84% at 12 months, 79% at 24 months and 75% at 36 months *(72)*.

Data are lacking on the access of female sex workers to ART. One study in a rural part of southern India *(73)* found that the AIDS-related mortality rate for female

Fig. 5.9. People who inject drugs as a proportion of all people living with HIV with a known transmission route and the proportion of people who inject drugs who received ART in reporting countries, WHO European Region, 2006 and 2012–2013

Source: European Centre for Disease Prevention and Control, and WHO Regional Office for Europe *(14)*.

sex workers with HIV was 10 times higher than the national mortality rate among women of a similar age. Nevertheless, when sex workers are able to access ART, their treatment outcomes are generally good, and the available evidence disproves concerns about possible increases in high-risk sexual behaviour *(29)*. ART services that are tailored for sex workers are very rare, however, even in settings with very high HIV prevalence in this population group.

Access to ART services for men who have sex with men is also insufficiently documented. A biennial online survey conducted by the Global Forum on MSM and HIV is filling some of these data gaps. About 1000 men living with HIV around the world participated in the most recent self-administered survey, which indicated that men who have sex with men have limited access to HIV treatment in low- and middle-income countries *(29)*.

Gender disaggregation in routine ART reporting currently does not explicitly reflect transgender people. However, the available evidence indicates that they have poor access to ART – as shown in a study from India *(8)*. Research also suggests that transgender women who do start ART are less likely to have positive interactions with health care providers than other women with lower treatment adherence rates and poorer outcomes *(74)*.

Box 5.5. WHO publishes comprehensive guidance on HIV services for key populations

The new consolidated WHO guidelines on HIV prevention, diagnosis, treatment and care for key populations *(75)* bring together all existing guidance relevant to the five globally recognized key populations (men who have sex with men, people who inject drugs, people in prisons and other closed settings, sex workers and transgender people) and update selected guidance and recommendations. The new guidelines constitute a comprehensive package of evidence-informed HIV-related recommendations for all key populations. They are intended to increase awareness of the needs and priorities of key populations, to help improve access, uptake and coverage of effective and acceptable services and to catalyse greater national and global commitment to adequate funding and services.

5.6 Retention in care remains a challenge

Once people living with HIV are linked to care, the major challenges include retaining them in care and providing them with optimal drug regimens (see below). Significant numbers of adults and children drop out of care at various points along the treatment cascade, from HIV diagnosis to long-term retention in care.

A great deal of the attrition occurs between taking an HIV test and starting ART (see Chapter 4) *(18,19)*. The attrition continues once people initiate ART. Based on reported data, the median retention rate at 12 months globally is about 86% and then gradually decreases to 73% after 5 years (Fig. 5.10). However, limitations in national reporting systems on retention mean that these data might not be representative of all treatment sites.

About one quarter of patients temporarily interrupt treatment *(76)* and another quarter appear to drop out of care within three years, according to the latest available data *(77)*. Among those lost, up to half (46%) may have died, according to a systematic review of studies in the WHO African Region and in India *(78)*. Similar findings emerge from a recent systematic review of data on cohorts of people receiving ART in South Africa, the country with the largest ART programme in the world. About two thirds of the people who started ART remained in care four years later. About 40% of the attrition was attributable to known deaths, with the remainder classified as "lost to follow-up" *(79)*. However, some people may "transfer" their care from one facility to another, especially in a country such as South Africa, with its large migrant labour populations. Other studies from the WHO African Region have indicated that some people shift in and out of care. This suggests that the reported attrition rates might be slightly overestimated *(21)*.

Earlier analysis of data from South Africa showed higher risks of loss to follow-up among more recent people receiving ART than among those who had been treated for longer periods *(80,81)*. This has been interpreted as a possible sign of the increasing strain being placed on health services because ART has been rapidly scaled up. However, in the systematic review cited above, retention in care after 12 months remained fairly stable over time, at about 80% *(79)*.

Certain populations (including women initiating ART during pregnancy or while breastfeeding) may have an increased risk of dropping out of treatment programmes. Recent evidence from Malawi *(82)* suggests that women initiating ART (option B+) during pregnancy and postpartum during breastfeeding have a five-fold higher risk of being lost to follow-up within six months of initiation compared with women who were not pregnant or breastfeeding when they started ART. Although current data are limited, as more countries proceed with implementing options B and B+, the retention of women should be monitored closely, especially during the critical HIV transmission period from pregnancy until breastfeeding is completed.

Retaining children and adolescents in care is a special challenge, notably in the WHO African Region. A multi-site evaluation involving more than 13 000 children receiving ART found that the risk of loss to follow-up within 18 months of starting ART was 9% in southern Africa, 14% in eastern Africa, 22% in western Africa and 4% in Asia *(83)*. Studies from rural Swaziland and Uganda have found that, compared with adults, adolescents were more likely to drop out of care *(84)* and that children and adolescents were less likely to achieve a suppressed viral load *(85)*.

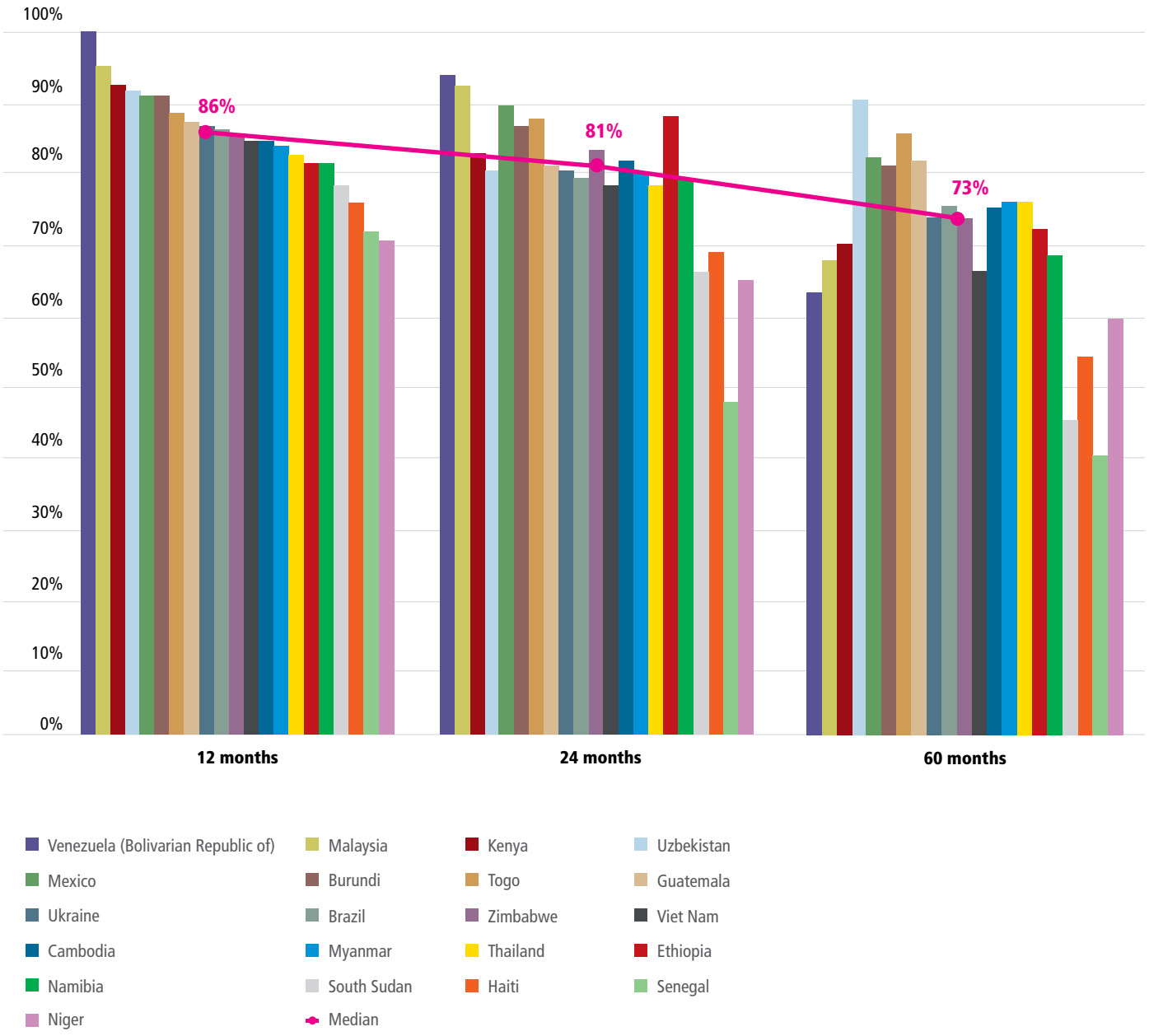
Several methods are being used to improve retention in care. Decentralizing ART services has proved effective *(86,87)* as has reducing clinic visits and waiting times *(88)* and using a model in which stable, long-term patients visit a clinician every six months and collect their medication every two months at a fast-track section of the clinic *(89)*. Other options include a national database and a medic alert-type card system[5] that would enable people to visit any health facility to access their medication *(90)*. Various types of adherence support are also highly effective, including patient education that is tailored for specific groups of patients, treatment support networks and adherence clubs, using mobile-phone text reminders and providing diary cards and food rations *(91,92)*. Adherence support that is tailored to the respective needs of children and adolescents would also improve retention.

In addition, several studies from the WHO African Region, most recently from Zimbabwe *(93)*, indicate that retention of people who start ART at primary health care facilities tends to be better than for people who start ART at higher levels of care, in particular at district or mission hospitals *(94,95)*. A recent systematic review found that interventions based on supporting self-management improve linkage to care and possibly also improve retention in care. Interventions aimed at delivery service design may also be effective, although the evidence appeared to be limited *(96)*.

The 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection *(4)* recommend using viral load testing as the preferred approach to monitoring the success of ART

[5] This involves using an electronic chip on a card that contains a person's medical information or a bar code on a card that links to an electronic medical record.

Fig. 5.10. ART retention rates (%) at 12, 24 and 60 months reported by selected low- and middle-income countries, 2013



Source: Global AIDS Response Progress Reporting (WHO/UNAIDS/UNICEF).

and diagnosing treatment failure, in addition to clinical and CD4 monitoring. According to the WHO HIV Country Intelligence Database, as of June 2014, 35 of the 58 focus countries surveyed by WHO had adopted the recommendation to conduct routine viral load monitoring (Table 5.3). Point-of-care CD4 testing technology is now available in most countries, and point-of care viral load technology is emerging. WHO is working with countries to determine and implement the appropriate combination of diagnostic approaches and technologies within a fully functional health laboratory system.

Table 5.3. Policies on CD4 point-of-care and viral load monitoring in 58 WHO HIV focus countries

Presence of CD4 point-of-care monitoring	Routine viral load monitoring recommended in national guidelines (although not necessarily implemented)
African Region: Burundi, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Democratic Republic of the Congo, Ghana, Kenya, Mozambique, Namibia, South Sudan, Swaziland, United Republic of Tanzania, Zambia, Zimbabwe	African Region: Angola, Botswana, Chad, Côte d'Ivoire, Ghana, Kenya, Lesotho, Malawi, Mozambique, Nigeria, Rwanda, South Africa, Uganda, Zambia, Zimbabwe
Region of the Americas: Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica	Region of the Americas: Brazil, Bolivia (Plurinational State of), Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Paraguay
Eastern Mediterranean Region: Djibouti, Morocco, Pakistan	Eastern Mediterranean Region: Pakistan, Yemen
European Region: Kazakhstan, Kyrgyzstan, Tajikistan	European Region: Kazakhstan, Kyrgyzstan, Russian Federation, Tajikistan, Ukraine
South-East Asia Region: India, Indonesia, Myanmar, Nepal	South-East Asia Region: Thailand
Western Pacific Region: Cambodia, Papua New Guinea, Philippines	Western Pacific Region: Cambodia, China

Source: WHO HIV Country Intelligence Database, as of June 2014.

5.7 More countries are using the simplest, most ideal and most tolerable drug regimens

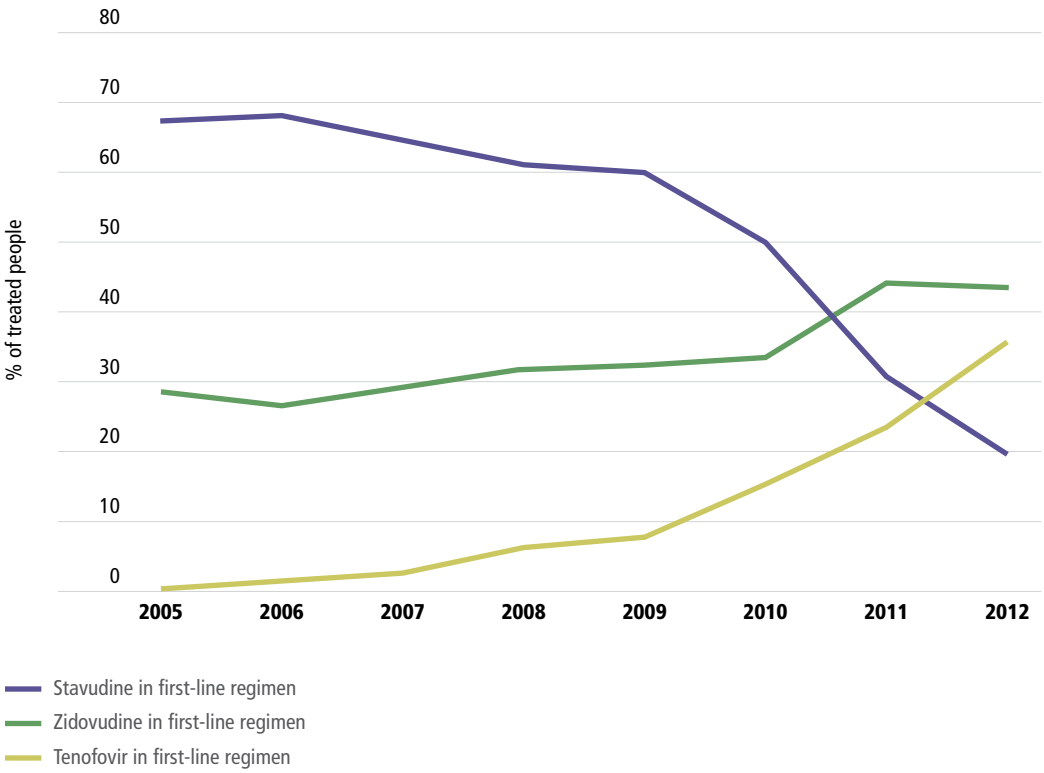
The 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection *(4)* recommend that people eligible in accordance with the guidelines receive a simplified, daily, single-pill regimen where possible and that countries use fewer first-line regimens. Fixed-drug combinations improve adherence and viral suppression and simplify procurement and supply management, which can reduce stock-outs *(29,97)*. A recent systematic review of the benefits of fixed-drug combinations for people and programmes *(97)* found advantages over multiple tablet regimens in terms of improved adherence, viral suppression, user preference and reduced stock-outs. In addition, reducing the number of first-line regimens can simplify prescribing and make the procurement process more efficient *(29)*.

At the end of 2012, more than 100 ARV regimens were being used to treat the more than 4.9 million people receiving adult first-line ART in the 69 countries that had detailed ART regimens. The minimum number of regimens used in any one country was two and the maximum 38; the median was eight, about the same as in 2011. Although too many different first-line regimens are still being used, most low- and middle-income countries have indicated that they plan to phase in the recommended first-line regimens, move towards a simplified formulary and procure fixed-dose combinations when available *(28)*. According to the WHO HIV Country Intelligence Database, by June 2014, 43 of 58 focus countries had moved to a recommended first-line regimen of TDF + 3TC (or FTC) + EFV.

The uptake of the preferred first-line treatment regimen is set to continue increasing: ARV procurement data compiled in the Global Price Reporting Mechanism of WHO show that 62% of all ARV regimens used in the second half of 2013 and the first quarter of 2014 contained TDF.

As Fig. 5.11 shows, the phasing out of stavudine (d4T), as recommended by WHO because of the high rates of toxicity associated with the use of this drug, continues at an encouraging pace. The proportion of people treated with

Fig. 5.11. Evolution of d4T, AZT and TDF in first-line antiretroviral therapy among adults and adolescents, 2005 to end-2012



Source: results of WHO ARV surveys from 2005 to 2013.

TDF-based regimens increased from less than 1% at the end of 2006 to 36% at the end of 2012, while the proportion treated with d4T-based regimens fell from almost 70% to less than 20% in the same period. Several WHO publications outline the phasing out of d4T, including the March 2014 supplement to the consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection *(98)* and a new policy brief on transitioning to new ARV regimens *(99)*. There are other indications that countries are rapidly implementing the recommendation to phase out d4T: ARV procurement data reported in the WHO Global Price Reporting Mechanism for the second half of 2013 and the first quarter of 2014 indicate that d4T was present in only 2% of the ARV regimens procured *(99)*.

Nevertheless, the fact that about 1 million people were still using d4T as part of first-line therapy at the end of 2012, mostly in countries with large numbers of people eligible for treatment in accordance with WHO guidelines, remains a concern *(28)*.

5.8 Drug resistance and toxicity are being monitored more closely

The goal of ART is to achieve and sustain viral suppression among everyone receiving ART. Studies show that very good outcomes can be achieved, including in resource-constrained settings. In a large study in Rwanda, for example, 86% of the people receiving ART had viral suppression 18 months after starting ART *(100)*; in a study in Senegal, about 80% of the people receiving ART were achieving viral suppression after five years *(101)*. Because of HIV's high mutation rate, some degree of HIV drug resistance is anticipated among people receiving treatment, even when appropriate regimens are provided and adherence is achieved *(102)*. In addition, as more people start ART earlier and remain on treatment for longer periods, preventing or minimizing serious drug reactions, and monitoring and managing ARV toxicity are increasingly prominent challenges (Box 5.6).

The most recent available data indicate that the global levels of HIV drug resistance among ART-naive people are modest but are increasing in some areas. Drawn from 36 WHO surveys in 12 low- and middle-income countries, the data show that the prevalence of HIV drug resistance to any drug among people starting ART ranged from 4.8% in 2007 to 6.8% in 2010 *(103)*.

Box 5.6. Monitoring drug resistance and toxicity issues

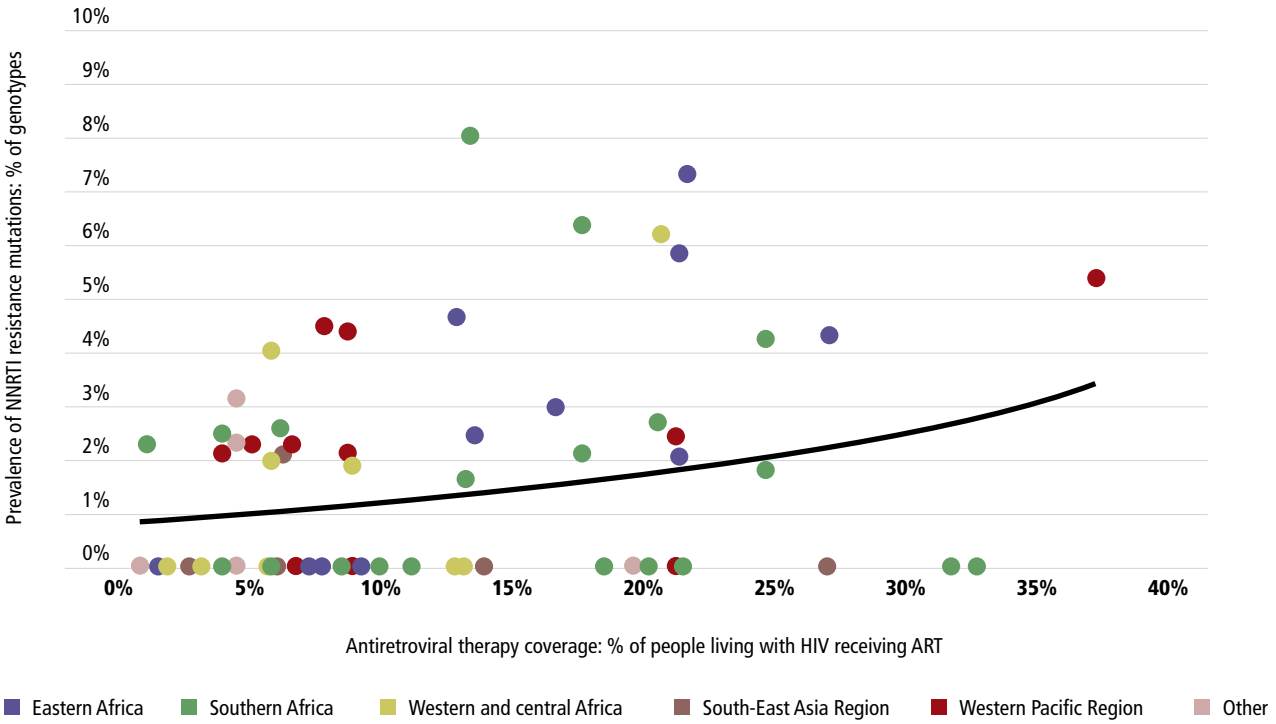
Monitoring the emergence of HIV drug resistance is essential for ensuring the best possible treatment outcomes. WHO and its partners have been monitoring the emergence of HIV drug resistance since 2004, using standardized protocols to support the identification of optimal first- and second-line treatment regimen choices and to select the most effective approaches for preventing mother-to-child transmission and for pre-exposure prophylaxis and post-exposure prophylaxis. Systems for monitoring early warning indicators and conducting surveillance of HIV drug resistance are important components of global and national strategies to minimize the emergence of preventable HIV drug resistance *(103)*. According to the WHO HIV Country Intelligence Database in June 2014, 25 of the 58 focus countries had an HIV drug resistance prevention and assessment strategy in place.

WHO has produced technical guidance and is supporting pilot projects to address gaps in toxicity data in several low- and middle-income countries *(104,105)*. The forthcoming WHO consolidated strategic information guide for HIV in the health sector (due in late 2014) will provide a basic framework that countries can use to integrate toxicity surveillance within national monitoring and evaluation systems.

Available data, depicted in Fig. 5.12, suggest an association between the improved coverage of ART and an increased prevalence of transmitted drug resistance to non-nucleoside reverse transcriptase inhibitors (NNRTI), such as nevirapine and efavirenz. Data from 82 surveys between 2004 and 2010, compiled in the WHO HIV drug resistance report 2012 *(103)*, found evidence of progressive increases in the levels of transmitted drug resistance to NNRTIs among people recently infected with HIV. In the areas surveyed in the WHO African Region, the prevalence of transmitted resistance to NNRTIs reached 3.4% [1.8–5.2%] in 2009 *(29)*. Similarly, a review of studies conducted from 2001 to 2011 found a significant increase in the prevalence of drug resistance parts of the WHO African Region, a trend apparently driven by NNRTI resistance in eastern and southern Africa *(106)*.

Reassuringly, the observed rise in HIV drug resistance has been modest, especially given the rapid expansion of treatment coverage (Box 5.7). This implies that the expansion of ART thus far has not triggered unexpected increases in transmitted drug resistance in the areas surveyed. The vast majority of people starting ART or switching ARV regimens are likely to respond to currently available first- and second-line therapy *(107)*.

Fig. 5.12. Relationship between transmitted resistance to NNRTI drugs and ART coverage, 2004–2010



Source: WHO HIV drug resistance report 2012.

Note: p-value adjusted for region: 0.039. Odds-ratio = 1.4 (95% CI 1.07-1.73)

Although WHO has determined that the risk of severe toxicity associated with the recommended ARV regimens is small, most toxicity reports tend to be based on limited sample sizes and have been conducted mainly in high-income countries. Nevertheless, treatment-related adverse events contribute to poor adherence and treatment outcomes: a recent systematic review found that adherence to ART was significantly lower among people who experienced an adverse event than among those who did not *(116)*.

Since 2011, WHO has supported pilot projects in toxicity surveillance for ARV drugs in six low- and middle-income countries (Côte d'Ivoire, Kenya, Lao People's Democratic Republic, Ukraine, United Republic of Tanzania and Viet Nam), along with capacity building in pharmacovigilance for ARV drugs, to strengthen reporting on ARV toxicity. The pilot projects are part of a collaborative project between WHO and the Bill & Melinda Gates Foundation and are aimed at producing technical guidance and building country capacity on the surveillance of the toxicity of ARV drugs.

Generating reliable data on the incidence of treatment-limiting toxicity within national HIV programmes requires new methods capable of deriving the data directly from emerging electronic patient-monitoring systems and from networks of sentinel hospitals that agree to report on all severe adverse drug reactions that require hospitalization.

Box 5.7. Simplifying the surveillance of HIV drug resistance

The current WHO HIV drug resistance monitoring and surveillance strategy *(108)* has been simplified into five main elements:

- monitoring early warning indicators of HIV drug resistance;
- surveillance of HIV drug resistance in adult populations that have recently acquired HIV (transmitted HIV drug resistance);
- surveillance of pre-treatment HIV drug resistance in adult populations that are initiating ART (pre-treatment HIV drug resistance);
- surveillance of acquired HIV drug resistance in populations of adults and children that are receiving ART (acquired HIV drug resistance); and
- surveillance of HIV drug resistance in treatment-naive children younger than 18 months of age.

Between 2004 and March 2014, 178 surveys of transmitted drug resistance, 111 surveys of acquired drug resistance (using previously recommended methods) and 13 surveys of HIV drug resistance surveys among children were implemented.

Between 2004 and March 2014, 178 surveys of transmitted drug resistance, 111 surveys of acquired drug resistance (using previously recommended methods) and 13 surveys of HIV drug resistance surveys among children were implemented.

Early warning indicators were revised in 2012 *(109)*, and WHO recently released methods for surveillance of transmitted, pre-treatment and acquired HIV drug resistance *(110,111)*. Countries may choose to introduce the various survey components in a phased approach. Nevertheless, it is desirable that all ART clinics annually report on their performance in accordance with the early warning indicators. HIV drug resistance data should be available to support national decision-making, and survey implementation should be planned to provide timely data whenever national ART guidelines are revised. Ideally, however, the pre-treatment and acquired drug resistance surveys should be repeated every three years.

As of March 2014, 185 rounds of adult early warning indicator assessments had been conducted using the WHO-recommended methods. The assessments covered more than 4900 clinics in 63 countries, with 47 countries having conducted more than one round of monitoring.

The assessments have provided a basis for several interventions, including strengthened record keeping systems in many countries *(112,113)* and defaulter tracing initiatives to track people with unknown outcomes and support their re-engagement into care. Funding has been secured for scaling up early warning indicators to more clinics, access to viral load testing has increased and routine reviews of pill collection have been introduced, along with a formal referral system to document transfers of care *(114)*. As a result, early warning indicators are now integrated in routine ART programme monitoring in several countries.

Results from HIV drug resistance early warning Indicators surveys completed and analyzed though mid-2012 are described in the HIV drug resistance report 2012 *(103)* and a special 2012 journal supplement *(115)*.

Chapter 6. REDUCING AND MANAGING COINFECTIONS AND OTHER COMORBIDITIES AMONG PEOPLE LIVING WITH HIV

Key Messages

Expanded HIV and TB services are saving lives, and other comorbidities are gaining attention

Expanded ART and TB services have put the target to reduce the annual number of TB-related deaths among people living with HIV by 50% by 2015 in reach. Other comorbidities, such as viral hepatitis and noncommunicable diseases, are moving onto the agenda.

- Expansion of TB and HIV co-management is having a powerful impact. ART provision for people coinfected with TB and HIV rose from less than 40% in 2009 to 70% in 2013, and the number of people dying from HIV-associated TB dropped by 36% from 2004 to 2011. Nevertheless, TB remains a leading cause of death among people living with HIV.
- HIV testing expanded further in 2013, when 48% of TB patients had a documented HIV status. The number of people living with HIV screened for TB has almost tripled since 2009.
- ART coverage among people with both TB and HIV was still low in some countries with very large burdens of HIV and TB coinfection, and services need to expand considerably.
- Viral hepatitis is a growing cause of mortality among people living with HIV. About 5–15% of all people living with HIV are coinfected with HCV and 5–20% with HBV. Hepatitis screening, prevention and treatment are getting more global attention.
- As people living with HIV live longer, they are more prone to noncommunicable diseases; chronic HIV care is a great opportunity to screen, monitor and manage chronic noncommunicable diseases.
- About 10% of adults living with HIV in low- and middle-income countries are 50 years or older, and few HIV programmes currently respond to their needs.
- Women living with HIV have a high risk of cervical cancer, which is preventable and curable. But in some places, including in the countries of eastern and southern Africa with a high burden of HIV infection, coordinated national efforts to address the disease are scarce.

People living with HIV are prone to a range of other infections and comorbidities, including TB, which remains the leading cause of death among people with HIV. The latest available data indicate that, in 2012, 1.1 million (13%) of the estimated 8.6 million [8.3 million–9.0 million] people who developed TB worldwide were living with HIV *(1)*. In addition, many other coinfections and comorbidities tend to be more severe for people living with HIV – notably malaria, viral hepatitis, cryptococcal meningitis and malnutrition.

HIV treatment and care programmes therefore need to include prevention (including immunization and prophylaxis for opportunistic infections), early diagnosis and treatment of opportunistic infections, mental health disorders and other comorbidities that are common among people living with HIV. Services for managing HIV and these various comorbidities also need to be integrated and linked further.

6.1 Fewer people living with HIV are dying from TB

The expanded provision – and increasing linkage and integration – of ART and TB services has resulted in a 36% drop from 2004 to 2011 in the estimated number of people dying from HIV-associated TB globally. This means that the world is on track to reach the 2015 target of reducing by 50% the annual number of TB-related deaths among people living with HIV (against the 2004 baseline). Nevertheless, 320 000 people died from

HIV-associated TB in 2012, most of them in the WHO African Region – equivalent to 1 in 5 of HIV-related deaths and 1 in 4 of TB deaths globally *(1,2)*.[1]

Further reducing deaths from HIV-related causes requires improved efforts to prevent HIV infection and TB (in the population as a whole and among people living with HIV), more timely case-finding for both HIV and TB and more prompt treatment of both diseases. Evidence *(3,4)* supports integrating HIV and TB services in a primary health care platform to achieve these goals.

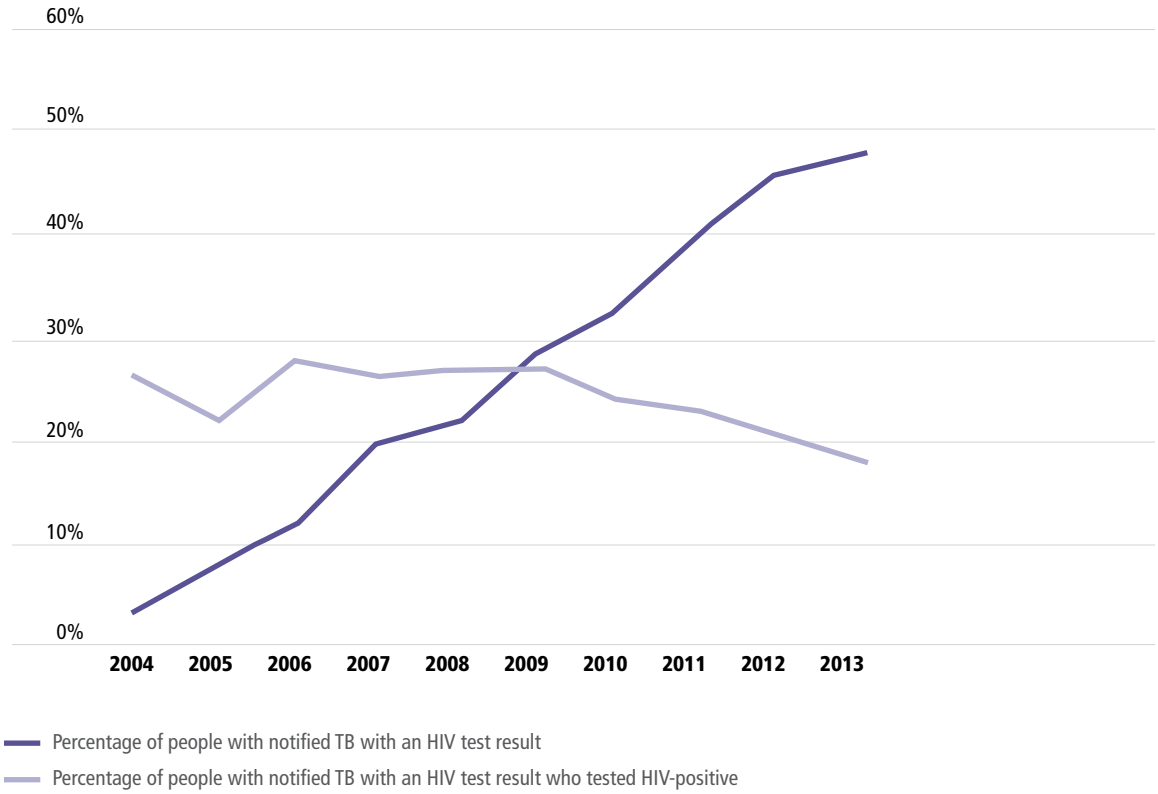
6.1.1 HIV testing among people with TB is increasing

HIV testing is the gateway for comprehensive prevention and care services for people living with HIV and TB. Offering HIV testing for TB patients and patients presumed to have TB is therefore a key entry point for HIV diagnosis. Provisional data reported by countries by June 2014 showed the following progress.

- The number of people with notified TB who had a documented HIV test result in 174 reporting countries rose to 2.9 million in 2013, equivalent to 48% of notified TB cases – up from 2.5 million (40% coverage) in 2011 and more than 15 times the 3% coverage reported in 2004 (Fig. 6.1).
- More than 85% of TB patients living in 22 of the 41 TB/HIV priority countries with the largest burdens of TB and HIV had a documented HIV status in 2013.
- HIV testing coverage was especially high in the WHO African Region, where 76% of TB patients had a documented HIV test result in 2013, up from 69% in 2011. About 40% of TB patients with an HIV test result in this region were HIV-positive.
- HIV prevalence among TB patients with an HIV test result ranged from 74% in Lesotho and Swaziland to less than 5% in Cambodia, India and the People's Republic of China *(5)*.

Although the scale-up in HIV testing among TB patients has been encouraging, overall coverage falls well short of the 100% target. There are also missed opportunities to test the partners of people with TB, as well as their household contacts, especially children. Research in diverse settings, including India and Kenya *(6)*, has shown that people with presumed TB also tend to have high rates of HIV infection, making it advisable also to offer them HIV testing in clinical settings.

Fig. 6.1. Percentages of notified TB patients with documented HIV status and who tested HIV-positive, 2004–2013



Source: provisional data from the Global Tuberculosis Programme Database, June 2014 *(5)*.

[1] The most recent available mortality data when this publication went to press were for 2012. The final data for 2013 will be released in the Global tuberculosis report 2014, due in the second half of 2014.

6.1.2 ART for people with both TB and HIV needs to expand further …

WHO recommends ART for all people living with HIV and active TB disease, irrespective of their CD4 cell counts. This approach, along with expanded uptake of ART at the population level, will reduce the overall risk of people living with HIV also developing and dying from TB *(7)*.

Although linking people with TB who test HIV-positive to HIV treatment and care can be a challenge, progress has been encouraging, with the number of people with both HIV infection and TB who received ART rising from very low levels in 2004 to more than 360 000 in 2013. Preliminary data for 2013 indicate that about 70% of people with notified TB who had a documented HIV-positive test result were receiving ART during TB treatment – up from less than 40% in 2009 (Fig. 6.2) *(5)*. However, this represents only 33% coverage among the estimated 1.1 million people with both HIV and TB worldwide in 2012 *(1)*.

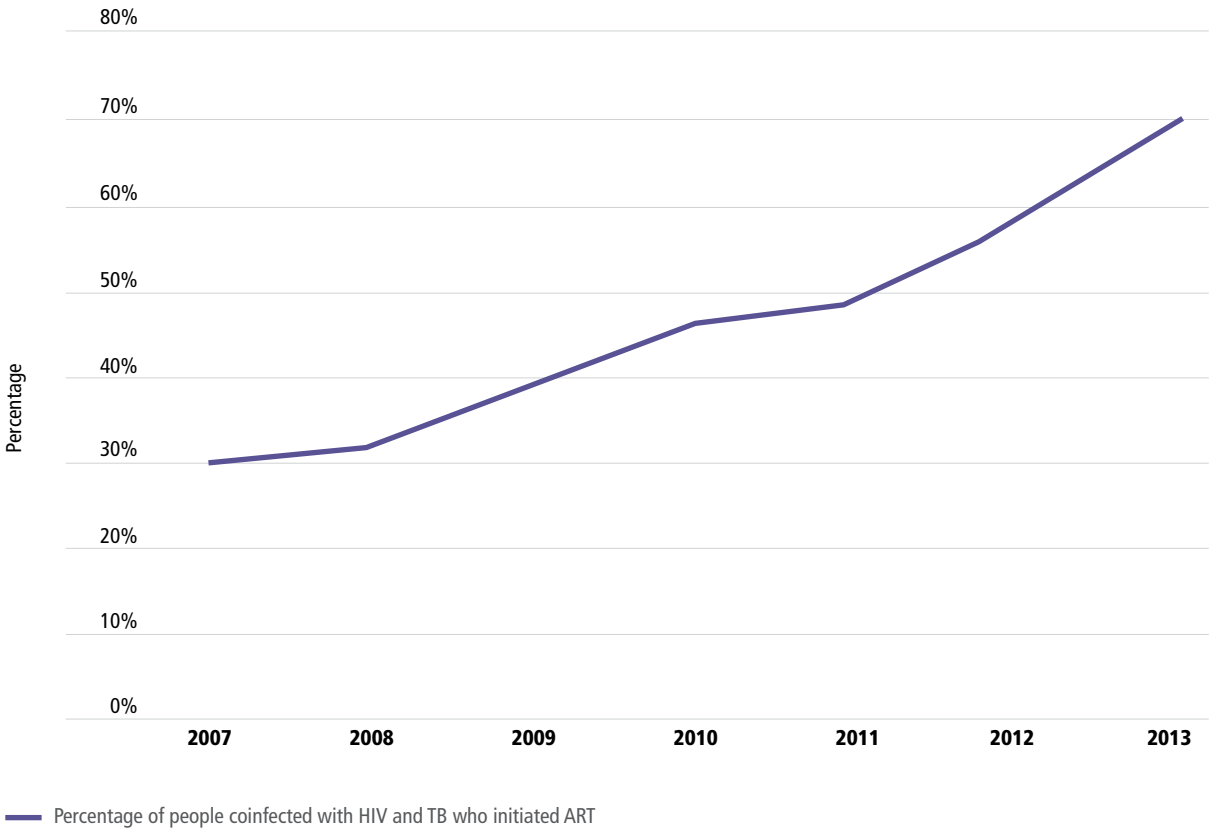
The benefits of this life-saving intervention are not being fully realized in several countries with very large burdens of HIV and TB coinfection. In the WHO African Region, provisional data from 41 reporting countries indicate that about 69% of people with notified TB in 2013 who had a documented HIV-positive test result were receiving ART, compared with 56% in 2012 *(5)*. However, only 28 of the 41 countries with the greatest burdens of HIV-related TB managed to initiate ART for more than half of the people with notified TB known to be living with HIV in 2012 *(1)*. Considerable progress is needed to reach the 2015 target of 100% coverage set in the Global Plan to Stop TB 2011–2015 *(1)*.

6.1.3 More people are receiving co-trimoxazole prophylaxis

Co-trimoxazole prophylaxis is another important intervention for protecting people living with HIV *(8,9)*. When provided to people coinfected with HIV and TB during routine TB care, co-trimoxazole prophylaxis has been shown consistently to reduce the risk of death and improve survival rates, as confirmed in a systematic review of 52 studies from the WHO African Region *(3)*. WHO recommends co-trimoxazole prophylaxis for all people living with severe or advanced HIV infection (WHO clinical stages 3 and 4), including those with active TB.

Globally, about 400 000 people with both TB and HIV were receiving co-trimoxazole prophylaxis in 2013, up from 16 000 in 2004. The coverage of co-trimoxazole prophylaxis among people with TB with a documented

Fig. 6.2. Percentage of people coinfected with HIV and TB who initiated ART, 2007–2013



Source: provisional data from the Global Tuberculosis Programme Database, June 2014 *(6)*.

HIV-positive test result in 131 reporting countries exceeded 80% in 2013 and has varied little since 2010. The WHO African Region and South-East Asia Region achieved especially high coverage: 83% and 88%, respectively. Based on provisional data from the 41 TB/HIV priority countries with the largest joint TB and HIV burden reporting by early June 2014, the percentage of people with both HIV and TB enrolled in co-trimoxazole prophylaxis in 2013 exceeded 90% in 15 countries *(5)*.

6.1.4 "The three I's" are being applied more widely

HIV infection increases the risk of progression to active TB. In countries with a high prevalence of HIV infection, TB control therefore poses a major challenge. In accordance with the findings of several systematic reviews, WHO updated its policy guidance on collaborative TB and HIV activities in 2012 *(10)*. WHO guidance now recommends initiating ART for all people living with HIV and active TB disease irrespective of their CD4 count, along with integrating "the three I's":

- intensified case-finding for active TB among people living with HIV;
- isoniazid preventive therapy among eligible people living with HIV; and
- TB infection control in health care settings to minimize the transmission of TB.

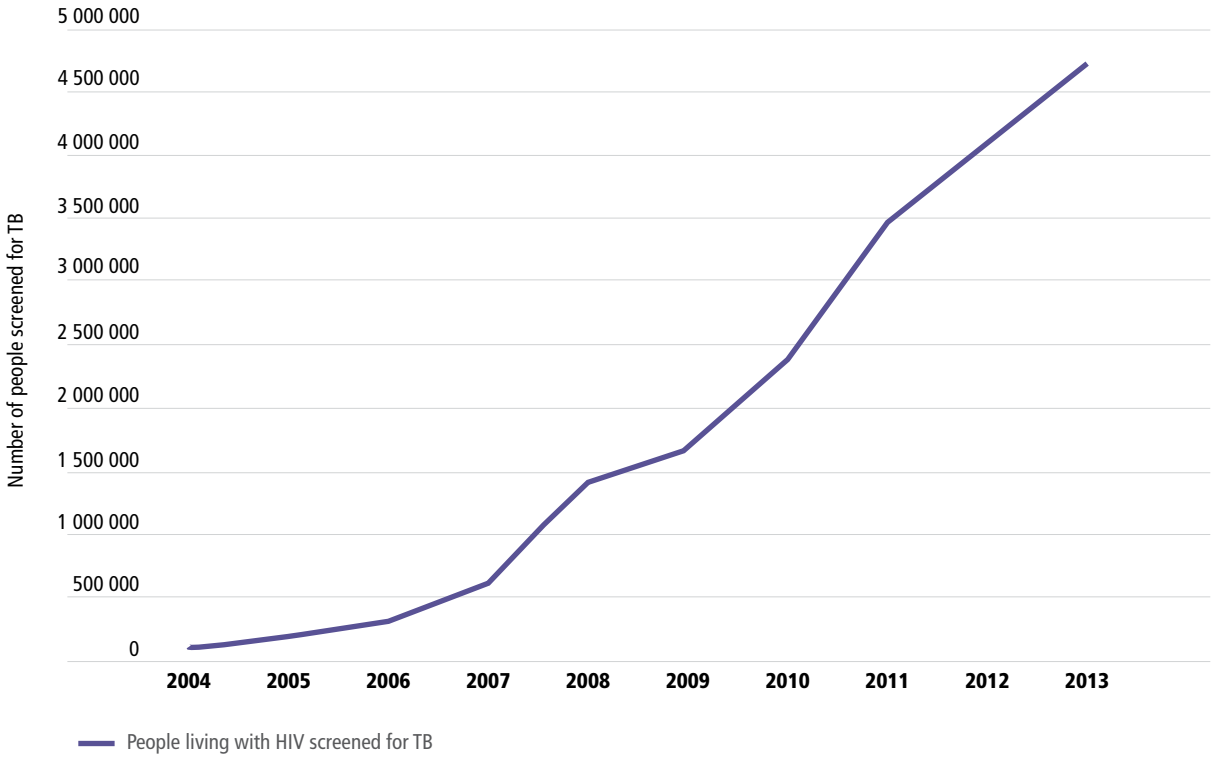
Recording and reporting of TB screening among people living with HIV and providing isoniazid preventive therapy to people without active TB are particular challenges in many countries, resulting in uneven progress in implementation of "the three I's" *(1)*.

Because people living with HIV face such high risks of developing TB disease, it is important to assess, at every clinical encounter, the TB status of people who are enrolled in HIV care by routinely enquiring about TB symptoms. WHO recommends using a simple screening of symptoms, since adults without current cough, fever, night sweats or weight loss are unlikely to have TB *(11)*.

In 2013, more than 4.7 million people enrolled in HIV treatment were screened for TB in the 61 countries that reported these data – almost three times the reported number of people screened in 2009 (Fig. 6.3) *(5)*. Not all countries have scaled up systematic screening, and even those that have done so may still encounter difficulties in reporting these data. The availability of a new molecular diagnostic test for TB (Xpert MTB/RIF) is a powerful tool for improving TB case-finding, including in HIV care settings, by improving sensitivity compared with smear microscopy *(12)*.

Considerable evidence supports the feasibility and efficacy of isoniazid preventive therapy for preventing TB among people with HIV *(3,13,14)*. Provisional data showed that isoniazid preventive therapy was initiated among almost 500 000 people newly enrolled in HIV care in 2013. One country – South Africa – accounted for almost 70% of the global total in 2013; about 80% of countries worldwide

Fig. 6.3. Intensified TB case-finding among people living with HIV in 61 reporting countries, 2004–2013



Source: provisional data from the Global Tuberculosis Programme Database, June 2014 *(5)*; 2014 Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS).

either did not implement or did not report the provision of isoniazid preventive therapy *(5)*. Reducing the dual burden of HIV and TB requires drastically improving the coverage of isoniazid preventive therapy.

People living with HIV are at high risk of acquiring TB in health care facilities and other crowded settings. National TB and HIV programmes (together with infection prevention and control programmes) should provide directives for implementing TB infection control in health care and congregate settings. Each health care facility needs a TB infection control plan that includes administrative, environmental and personal protection measures to reduce the transmission of TB and a system to address TB disease among health care workers. These workers should be given a package of HIV services (including confidential HIV testing and counselling and ART and isoniazid preventive therapy if they test HIV-positive and are eligible for treatment) to reduce their risk of acquiring TB in the workplace *(15,16)*.

6.2 Management of HIV and viral hepatitis needs to improve

Hepatitis C (HCV) is a viral infection that affects an estimated 5–15% of all people living with HIV worldwide (and up to 90% of the people who inject drugs) *(17,18)*. In the WHO European Region an estimated 44% of people who inject drugs have acquired HCV, with the burden highest in countries in the eastern part of the Region *(19)*. In 2013, an estimated 15.0 million adults in the eastern part of the Region had hepatitis C *(19)*. Recent data from cohort studies show that liver disease has emerged as a leading cause of death among people living with both HIV and HCV in Europe as a whole *(20)*. Chronic hepatitis B (HBV) infection affects an estimated 5–20% of people living with HIV worldwide *(17,18)*. The burden of coinfection with HBV is greatest in low- and middle-income countries, especially in the African and South-East Asia Regions.

Overall, hepatitis B and C are responsible for an estimated 1.3 million deaths globally each year, mostly among individuals who have not acquired HIV *(21)*. It is, however, a growing cause of morbidity and mortality among people living with HIV, including those receiving ART. Many people with chronic HBV or HCV infection develop liver cirrhosis and primary liver cancer, including people living with HIV. Nevertheless, viral hepatitis epidemics are still largely neglected. Most people with chronic HBV or HCV infection are unaware that they are infected and therefore do not seek health care, nor are they assessed to determine whether they would be eligible for hepatitis treatment, resulting in late diagnosis and poor treatment outcomes.

HBV vaccination is central to efforts to prevent HBV infection. Vaccination could prevent an estimated 4.8 million hepatitis B-related deaths over a 10-year period in 73 countries receiving vaccination support from the GAVI Alliance *(22)*. Although there is no vaccine for HCV, there are proven strategies for preventing HBV and HCV infection for the populations at higher risk, such as interventions for improving the safety of blood supplies, therapeutic injections and other medical procedures. Harm-reduction measures have been shown to drastically reduce HIV and HCV incidence among people who inject drugs *(23)*.

Highly effective treatments also exist for HCV infection. In addition to using interferon and ribavirin combination therapy for people with HCV infection, early initiation of ART can slow liver disease progression and the worsening of liver fibrosis *(20)*. New, directly acting antiviral drugs offer cure rates exceeding 90% for chronic HCV infection, with an all-oral, once-daily 12-week treatment regimen. Effective treatment is also available for chronic hepatitis B infection, although treatment needs to be lifelong. Such treatments have the potential to dramatically reduce morbidity and mortality among people living with HIV who are coinfected with HBV and/or HCV.

Screening to detect HCV among people living with HIV followed by treatment is especially important in settings in which many people inject drugs or have been exposed to contaminated blood or blood products or unsafe injection or surgical practices. WHO issued guidelines on the screening and treatment of HCV in early 2014 and will be launching guidelines on the screening and treatment of HBV in 2015. WHO guidelines on the use of ARV drugs provide guidance on managing HIV coinfection with HBV or HCV and cover issues related to screening, treatment, care and drug interactions. The first-line ART regimen recommended by WHO, which contains tenofovir (TDF) and lamivudine (3TC), has a significant antiviral effect on HBV, and ART initiation is recommended for all people coinfected with HIV and HBV and showing evidence of severe chronic liver disease, regardless of CD4 cell count.

6.2.1 The interaction of HIV with other coinfections is being addressed …

HIV, other sexually transmitted infections and non-sexually transmitted infections of the reproductive tract frequently coexist. Most of these infections are asymptomatic, especially among women. However, even asymptomatic sexually transmitted infections can cause complications, be transmitted to sexual partners and enhance HIV transmission. Preventing and controlling sexually transmitted infections are therefore important components of a comprehensive HIV prevention strategy, and screening, diagnosis and treatment of sexually transmitted infections should be offered routinely as part

of comprehensive HIV care among adults and adolescents.

WHO will release updated guidelines on treating and managing sexually transmitted infections in 2015. Recently issued guidelines include recommendations on periodic screening and presumptive treatment for asymptomatic sexually transmitted infections among sex workers as well as periodic testing for asymptomatic urethral and rectal Neisseria gonorrhoeae and Chlamydia trachomatis infections and asymptomatic syphilis infection among female sex workers, men who have sex with men and transgender people.

Cryptococcal meningitis is another major contributor to mortality among people living with HIV, both before and after ART is initiated. Cryptococcal meningitis accounts for an estimated 10–20% of HIV-related deaths in the WHO African Region *(24)*. Rapid advice issued by WHO in 2011 covers diagnosis; screening and prevention of cryptococcal infection; induction, consolidation and maintenance regimens; and the timing of ART *(25)*. A supplement to the WHO consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection *(15)* will be issued in late 2014 and will provide additional guidance on cryptococcal infection and on skin and oral manifestations of HIV infection, including Kaposi sarcoma, the most common HIV-related malignancy.

Malaria is one of the leading causes of childhood illness and death in the world, with 90% of malaria deaths occurring in the WHO African Region. Malaria is also an important cause of illness among adults with both HIV and malaria. People living with HIV face elevated risks of malaria infection and disease and are at high risk of experiencing complications from malaria *(26,27)*. People living with HIV with immunosuppression and living in malaria-endemic areas, all infants and children younger than five years of age and pregnant women are at particular risk of severe malaria and its complications. Some studies suggest that adults living with HIV may also have a poorer response to antimalarial therapy *(28)*. The impact of malaria on HIV infection is less clear, but evidence indicates that being infected with malaria can worsen the progression of HIV disease *(29)*.

Key interventions to control malaria include prompt and effective diagnosis and treatment with artemisinin-based combination therapies and using insecticide-treated nets and indoor residual spraying with insecticide to control the vector mosquitoes. Wider recognition of the interplay between the two diseases has led to an increase in efforts to combine malaria and HIV services. In an integrated mass campaign to provide commodities and services to decrease malaria, diarrhoea and HIV infection in western Kenya, for example, more than 440 disability-adjusted life-years were added for every 1000 campaign participants *(30)*.[2] The effectiveness of co-trimoxazole prophylaxis in reducing mortality and morbidity across varying levels of malaria prevalence is well established *(31)*. Expanded access to ART and the ongoing shift towards earlier initiation of ART has warranted an update of the existing WHO guidelines on co-trimoxazole prophylaxis, which is due to be published in 2014 *(32)*.

6.2.2 … but some comorbidities present new challenges

People living with HIV are at increased risk of developing a range of chronic noncommunicable diseases, including cardiovascular disease, diabetes, liver, kidney and lung diseases and some types of cancer *(33)*. With effective ART, people living with HIV are also living longer and experiencing noncommunicable diseases associated with ageing (see Chapter 7).

WHO is identifying a package of interventions to address chronic comorbidities along with recommendations for screening and treatment of major, chronic noncommunicable diseases for all individuals, irrespective of their HIV serostatus. Additional guidance on diagnosis and management of chronic comorbidities in people living with HIV is scheduled for 2015 as part of the pending full revision of the consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection. Chronic HIV care offers the opportunity for screening, monitoring and managing chronic noncommunicable diseases, especially through primary care. Integrating interventions such as nutritional assessment, dietary counselling and support, cessation of tobacco smoking, promoting exercise and monitoring blood pressure as part of HIV care provide opportunities for reducing the risks of noncommunicable diseases among people living with HIV.

Women living with HIV have a higher risk of pre-cancer and invasive cervical cancer, which is one of the leading causes of death among women in sub-Saharan Africa, Latin America and Asia *(34)*. Nevertheless, this type of cancer is not only preventable but also curable if diagnosed and treated early. Thus, all women with HIV should be screened for cervical cancer regardless of age, ART status or CD4 cell count and viral load. Immediate management for pre-cancerous and cancerous lesions should be provided. In the WHO African Region, cervical cancer screening and management remain rare, and coordinated national efforts to address the disease are scarce – including in the countries of eastern and southern Africa with a high burden of HIV infection *(35)*. Further integrating HIV and sexual and reproductive health services could improve the prevention and treatment of this type of cancer.

The human papillomavirus causes nearly all cases of cervical cancer *(36)*. WHO guidance covers human papillomavirus vaccination and prevention, screening

[2] The campaign involved providing HIV testing and counselling, water filters, insecticide-treated bed-nets, condoms and, for people living with HIV, co-trimoxazole prophylaxis and referral for ongoing care.

and treatment and palliative care for cervical cancer *(37)*. Concerns about safety or reduced efficacy among women who may be infected with HIV should not defer the initiation of large-scale human papillomavirus immunization, and HIV testing should not be a prerequisite before routine human papillomavirus immunization. Rwanda is among the countries to have implemented major human papillomavirus vaccination campaigns in recent years. In 2011–2012, it vaccinated more than 220 000 girls with all three doses of the vaccine, achieving three-dose coverage rates of 93–96% among eligible girls in that period. The country has also introduced nationwide screening and treatment programmes – evidence that these interventions are feasible in resource-limited settings *(38)*.

Chapter 7. PROVIDING COMPREHENSIVE SERVICES FOR KEY POPULATIONS

Key Messages

Key populations are missing out on the recent progress

Despite some improvements, HIV services are not reaching enough key populations, and the HIV prevalence among them remains very high in all regions.

- Punitive laws and practices and a lack of political will are still major barriers blocking access to prevention and treatment services.
- Studies show that men who have sex with men are 19 times and transgender women are almost 50 times more likely to have HIV than the general adult population, and female sex workers are 14 times more likely to have HIV than other women.
- Even though the incidence of HIV infection is declining overall, it appears to be rising in several places among men who have sex with men. In some countries, a hostile context makes it difficult and even dangerous for nongovernmental organizations to provide services for this population.
- The HIV needs of transgender people continue to be neglected or ignored, despite the high burden of HIV among them.
- Needle and syringe provision has expanded in some countries, but service coverage is not sufficient to stabilize or reverse HIV epidemics in this population.
- Worldwide, 79 countries reported offering opioid substitution therapy in 2013, but two thirds of them were providing it to 40% or less of the opioid-dependent people who inject drugs.
- HIV services are lacking in prisons and other closed settings. Needle and syringe programmes were available in prisons in only eight countries, and opioid substitution therapy was available in prisons in about 40 countries, mostly in Europe and the Americas. Very few countries provide ART in prisons.

A disproportionately high prevalence of HIV infection continues to be reported among key populations, especially men who have sex with men, transgender people, people who inject drugs, sex workers and prisoners. They represent most of the people affected by HIV outside the WHO African Region and an increasingly recognized share of new infections in urban settings within the African Region (Box 7.1). In most low- and middle-income countries, these key populations continue to be poorly served with evidence-informed HIV interventions.

There is considerable overlap in the risk behaviour of key populations along with significant mixing of key population networks in many communities. In addition, many people from key populations engage in more than one type of high-risk behaviour. For example, people who inject drugs may sell sex, men who have sex with men may inject drugs and transgender people may perform sex work. The criminalization of these types of behaviour in many countries also means that key populations are likely to be incarcerated. These overlapping risks mean that HIV prevalence rates in key populations can be exceptionally high.

Box 7.1. The HIV epidemic weighs heavily on key populations

Key populations are at great risk of acquiring HIV. Studies estimate that men who have sex with men are 19 times more likely to have HIV than the general population *(1)*, and female sex workers are 14 times more likely to have HIV than other women *(2)*. A recent review of evidence from 15 countries *(3)* found that as many as 20% of transgender people are living with HIV. Transgender women are almost 50 times more likely to have HIV than adults in the general population *(3)*.

These populations bear a great deal of the HIV burden in many low- and middle-income countries. Along with their sex partners, they are estimated to account for as much as 80% of the people newly infected with HIV in Morocco, 65% in Peru, 50% in Nigeria, 47% in the Dominican Republic, 33% in Kenya and 28% in Mozambique *(4)*. About 40% of the people newly diagnosed with HIV in the WHO European Region in 2012 were people who inject drugs and men who have sex with men *(5)*. In China, it is estimated that more than one third of the people acquiring HIV infection are men who have sex with men, and projections for Asia overall indicate that unprotected sex between men could account for half or more of all new infections by 2020 *(4)*.

WHO guidelines issued in 2014 *(6,7)* recommend several options for expanding and enhancing prevention efforts in key populations. They include continuing to scale up the provision of male and female condoms, needle and syringe programmes, services for preventing and managing sexually transmitted infections as well as the provision of ART regardless of CD4 cell count for HIV-positive partners in serodiscordant relationships *(6)* and offering ARV drugs for pre-exposure prophylaxis of HIV for men who have sex with men as part of a comprehensive HIV prevention package *(7)*.

Nevertheless, the extent to which countries' national HIV policies and plans explicitly address key populations differs greatly depending on the region and the population, as shown in Table 7.1. Depending on the region, between 13% and 100% of the 58 WHO HIV focus countries reported that their national HIV policies and plans address people who inject drugs, and between 54% and 100% of countries reported addressing men who have sex with men in these policies and plans.

Beyond such formal recognition, translating commitments into practice remains difficult in many countries, especially where legal, social and logistical hindrances – including stigma, discrimination, and punitive laws and policies – prevent or undermine the provision and use of HIV services (Box 7.1).

Table 7.1. Number and percentage of 58 WHO HIV focus countries, by WHO region, explicitly addressing specific key populations in national HIV policies and plans, 2013

WHO Region	Focus countries	Men who have sex with men		Transgender people		Sex workers		People who inject drugs		Prisoners	
		n	%	*n*	%	*n*	%	*n*	%	*n*	%
African Region	24	13	54%	1	4%	16	67%	3	13%	14	58%
Region of the Americas	10	9	90%	7	70%	9	90%	2	20%	7	70%
Eastern Mediterranean Region	8	5	63%	1	13%	6	75%	4	50%	2	25%
European Region	6	5	83%	0	0%	5	83%	5	83%	3	50%
South-East Asia Region	5	5	100%	5	100%	5	100%	5	100%	2	40%
Western Pacific Region	5	4	80%	2	40%	4	80%	4	80%	2	40%
Total	58	41	71%	16	28%	36	62%	23	40%	30	52%

Source: WHO HIV Country Intelligence Database, as of June 2014.

Mandatory and coerced testing of key populations, including prisoners *(8)* and migrants *(9,10)*, is still being reported, including in clinical settings *(11)*. In November 2012, WHO reiterated its opposition to mandatory testing and emphasized that all forms of HIV testing and counselling should be voluntary and should adhere to the "five C's": consent, confidentiality, counselling, correct test results and connections to care, treatment and prevention *(12)*.

Box 7.2. The compounded HIV risks of adolescents in key populations

Available aggregate data show significantly higher HIV prevalence and increasing rates of diagnosed HIV infection among adolescent men who have sex with other men than among their peers in the general population *(13–15)*. Several small studies have reported that between 19% and 22% of adolescent transgender women are living with HIV – which is considerably higher than the prevalence reported in other studies of adolescents *(16)*. Moreover, adolescent transgender women with a history of sex work may be more than four times as likely to be living with HIV than their peers without such a history *(16)*. Studies from Canada *(17)*, Thailand *(18)* and various countries in southern Asia *(19,20)* have found that engaging in sex work before age 18 years is associated with grave risks of physical and sexual violence and may relate to a two- to four-fold increase in the prevalence of HIV infection.

Alongside often-harsh stigmatization and discrimination, limitations in data have been undermining efforts to understand and effectively deal with the epidemics among key populations. Accurate and sufficient strategic information about the sizes and geographical distribution of key populations, their HIV prevalence and the factors that increase their vulnerability have not been plentiful.

Several countries are now filling these gaps, and more large surveys have estimated the sizes of hard-to-reach key populations in recent years *(21,22)*. For example, Ethiopia *(23)* has estimated the size of key populations in 10 cities and is using this to design HIV interventions among female sex workers and truck drivers, and South Africa has been estimating the sizes of key populations in three major cities *(23)*. The sizes of key populations have also been estimated in such countries as the Dominican Republic, Indonesia, Nigeria, Pakistan and Viet Nam.

Also increasing are modes-of-transmission studies to estimate the proportions of new HIV infections accounted for by various populations (including in generalized epidemics). In the WHO Eastern Mediterranean Region, Djibouti, the Islamic Republic of Iran, Morocco, Sudan and Tunisia have conducted such studies as well as studies to determine the availability and use of HIV services among key populations. In the Islamic Republic of Iran, for example, people who inject drugs account for an estimated 56% of the people who acquire HIV infection, and their sexual partners account for a further 12%. In Morocco, female sex workers and their male clients account for about one half of the people newly infected with HIV, and it is estimated that men who have sex with men account for more than 80% of HIV transmission in Tunisia. Research in Kenya and South Africa indicates that sex workers and their clients, people who inject drugs and men who have sex with men could account for roughly 33% and 26%, respectively, of the people newly infected with HIV in those epidemics *(24)*.

These types of data are being combined with mapping and other technological tools to generate more detailed pictures of localized epidemics, which can enable countries to identify where HIV services are mismatched or insufficient and to repackage and focus services more strategically and effectively, including for reaching key populations (Box 7.3) *(21)*.

India's use of more detailed strategic information about HIV transmission among key populations has been credited with helping to reduce the number of people acquiring HIV infection by more than half since 2000 *(25)*. Angola *(26)*,

Box 7.3. Tailoring services for key populations

Bundling or combining services for key populations is an increasingly attractive approach. Since high-risk behaviour for HIV infection among key populations often overlaps (for example, a person might sell sex to fund the purchase of drugs) *(30)*, people who sell sex may also need services for drug-related education, hepatitis testing and treatment, drug-dependence treatment options and harm reduction, such as needle and syringe programmes *(31)*. Responding to that situation, Young Power in Social Action in Chittagong, Bangladesh has been providing a one-stop package of services that encompass sexual and reproductive health (such as condom promotion and sexually transmitted infection diagnosis), HIV (such as HIV counselling and testing) and harm reduction (such as needle and syringe programme and opioid substitution therapy) *(32)*.

Brazil, Ecuador, Kenya *(27)*, Morocco, Namibia, Nigeria *(28)* and Viet Nam *(29)* are among several other countries that have been enhancing their knowledge of the sizes, behaviour and access to services of key populations *(21)*. Their experiences also confirm the importance of generating these data in collaboration with representatives from networks of key populations and of collecting and using the data in ways that do not expose those populations to further harm.

Nevertheless, more can be done to improve the information on the access of key populations to HIV and other vital health services. Data are lacking on the access of female sex workers to ART, for example, even though it is known that ART services tailored for sex workers are uncommon, even in settings with a very high prevalence of HIV infection in this population group. Similarly, access to ART services for men who have sex with men is insufficiently documented, and sex disaggregation in routine ART reporting currently does not explicitly reflect transgender people. Although limited, the available evidence suggests that transgender people struggle to access and adhere to ART *(33,34)*. Access to ART for people who inject drugs also appears to be very limited. For example, in the WHO European Region, about 21% of people receiving ART said they had acquired HIV through injecting drug use – a strikingly smaller figure than the estimated 59% of people who were eligible for ART and who had reported injecting drug use *(35)*.

Establishing clear targets is important for expanding access to HIV interventions for key populations. WHO and various partners have developed a tool for setting targets for prevention, care and treatment services for key populations and for monitoring progress towards these targets. It proposes a package of core HIV and sexually transmitted infection interventions along with a set of indicators that is aligned with the reporting systems of other United Nations and donor agencies. Information derived from these indicators will inform the development of policy and the implementation of programming *(36)*. The process is likely to be most useful if it includes the active participation of the relevant populations.

7.1 Comprehensive services for sex workers are making an impact …

The HIV epidemic continues to have a disproportionate impact on female, male and transgender sex workers. Even in generalized epidemics in the African Region, female sex workers are estimated to face more than 12 times increased odds of living with HIV compared with women overall, according to a meta-analysis of HIV data for this key population *(2)*. The pooled HIV prevalence among female sex workers was 37% in sub-Saharan Africa, 11% in eastern Europe, 6.1% in Latin America and the Caribbean, 5.2% in Asia and 1.7% in the Middle East and North Africa (Fig. 7.1) *(2)*. The median prevalence among male sex workers, based on published literature from 24 countries since 2006, is about 14% *(37)*.

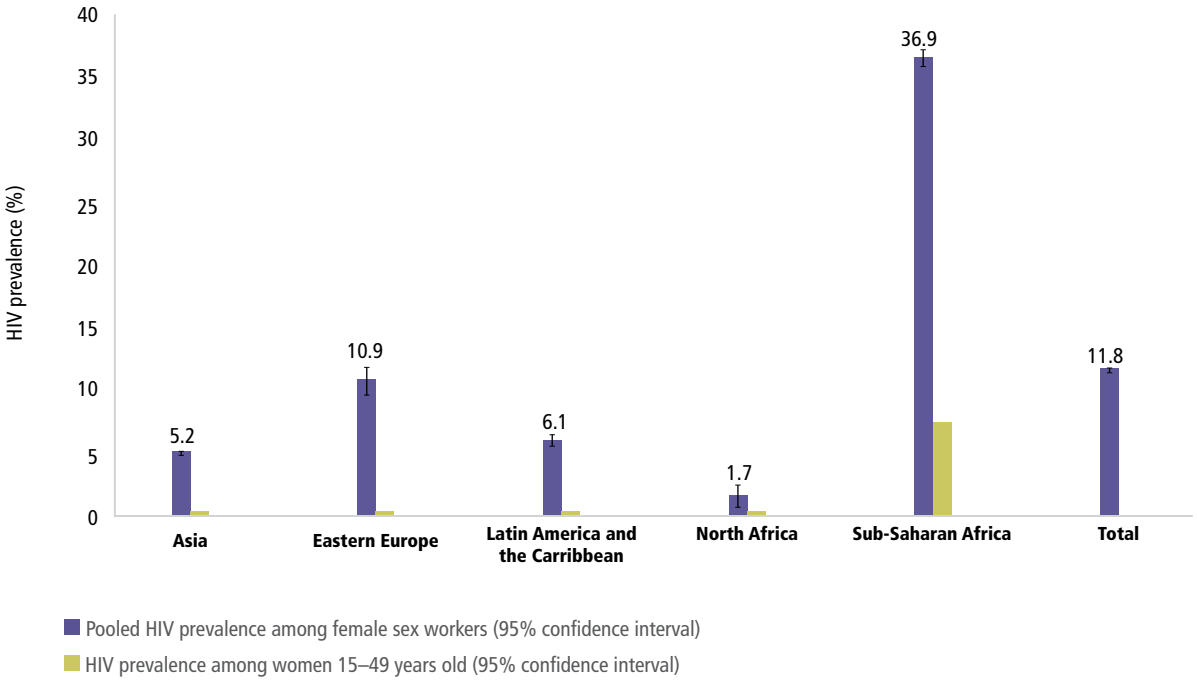
Risk-reduction programmes for female sex workers feature in the HIV strategies of most countries reporting to the Global AIDS Response Progress Reporting system. In some countries, these strategies encompass support for community networks that involve sex workers, health service providers, law enforcers and other stakeholders in facilitating and providing HIV services.

The coverage of HIV prevention services for female sex workers is difficult to estimate accurately, however, because information on the sizes of these populations is incomplete in many countries. Available data from the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) indicate that, overall, between two thirds and three quarters of sex workers were being reached with HIV prevention programmes in the 114 countries that reported these data during 2011–2013. Again according to the Global AIDS Response Progress Reporting, 57% of sex workers in these 114 countries took an HIV test in the previous 12 months. Apparently mirroring these encouraging reports are indications that condom use during sex work is relatively common in many countries and could be increasing: in 2012, 44 countries reported higher median condom use in 2012 than in 2009, 85% versus 78% *(37)*.

However, service provision and access varies considerably between regions and countries. In the WHO African Region, systematic provision of services for sex workers remains uncommon, with services often provided as part of small research studies or projects *(38)*. According to the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS), in the WHO Eastern Mediterranean Region, the proportions of female sex workers reached with HIV prevention services in 2012 ranged from 6% in Sudan and 14% in Pakistan to 28% in Tunisia and 42% in Morocco. No other countries in the Region reported these data.

Two sets of factors appear to be holding back quicker progress. In most countries, insufficient domestic resources are being allocated to prevent HIV among sex workers. Except in parts of the Region of the Americas and in southern Africa, most of the funding for HIV prevention in this population comes from international donors *(37)*. In addition, punitive laws and practices continue to act as major barriers. Supportive, rights-based policies and greater sensitization of service providers, law enforcement agencies and communities are crucial for realizing the benefits of a public health approach and for making an impact on the epidemic (Box 7.4).

Figure 7.1. Pooled HIV prevalence among female sex workers in low- and middle-income countries, by region, 2007–2011



Source: Baral S et al. (*2*).

Box 7.4. Community empowerment helps reduce HIV and other sexually transmitted infections

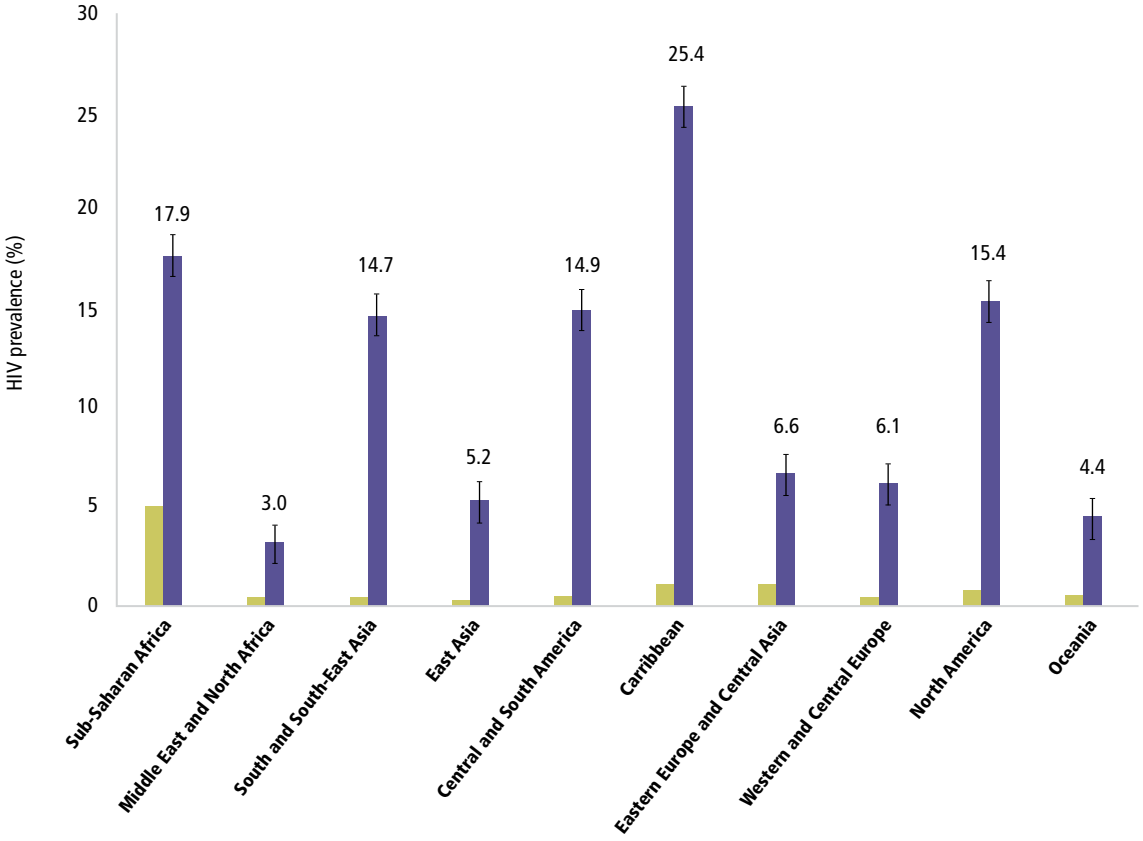
Making appropriate services available can have a powerful impact in limiting HIV transmission during sex work, especially when sex workers are actively involved. Services that empower and protect sex workers by addressing and altering the social, political and material conditions surrounding sex work have proved successful in restricting HIV transmission in Asia. An example is the Avahan programme, which was introduced in 69 districts in southern India *(39,40)*. The first systematic review of such interventions in low- and middle-income countries, conducted by WHO *(41)*, has found that these kinds of interventions can be effective for reducing HIV and sexually transmitted infections and for increasing consistent condom use with clients, although not necessarily with regular partners.

7.2 … but services for men who have sex with men are not keeping pace with the epidemic

According to the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS), the median prevalence of HIV infection among men who have sex with men is still consistently higher than the prevalence among adult men overall. A 2012 meta-analysis found that the pooled HIV prevalence among men who have sex with men ranged between 14% and 18% in Latin America, sub-Saharan Africa and South and South-East Asia, and was 25% in the Caribbean (Fig. 7.2) *(1)*. Although the incidence of HIV infection is declining in most global regions, the incidence among men who have sex with men appears to be rising in several places – including in parts of Asia *(42)* and Europe *(43)* and in Australia *(44)* and the United States of America *(45,46)*. Of particular concern are the communities with recognized and longstanding HIV prevention programmes but that are nevertheless now experiencing increasing HIV incidence.

In the 109 countries providing these data at least once during 2011–2013, a median of 69% of men who have sex with men were reportedly reached with HIV prevention programmes. However, according to the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS), the proportion of men who have sex

Figure 7.2. Pooled HIV prevalence among men who have sex with men in low- and middle-income countries, by region, 2000–2010



Prevalence of HIV infection among all men 15–49 years old

Prevalence of HIV infection among men who have sex with men 15–49 years old (95% confidence interval)

Source: reprinted from The Lancet, 380, Beyrer C, Baral SD, van Griensven F, Goodreau SM, Chariyalertsak S, Wirtz AL et al., Global epidemiology of HIV infection in men who have sex with men, 367–77, copyright (2012), with permission from Elsevier *(1)*.

with men who took an HIV test in the previous 12 months and knew the result was considerably smaller – a median of 42% in the 108 countries reporting those data.

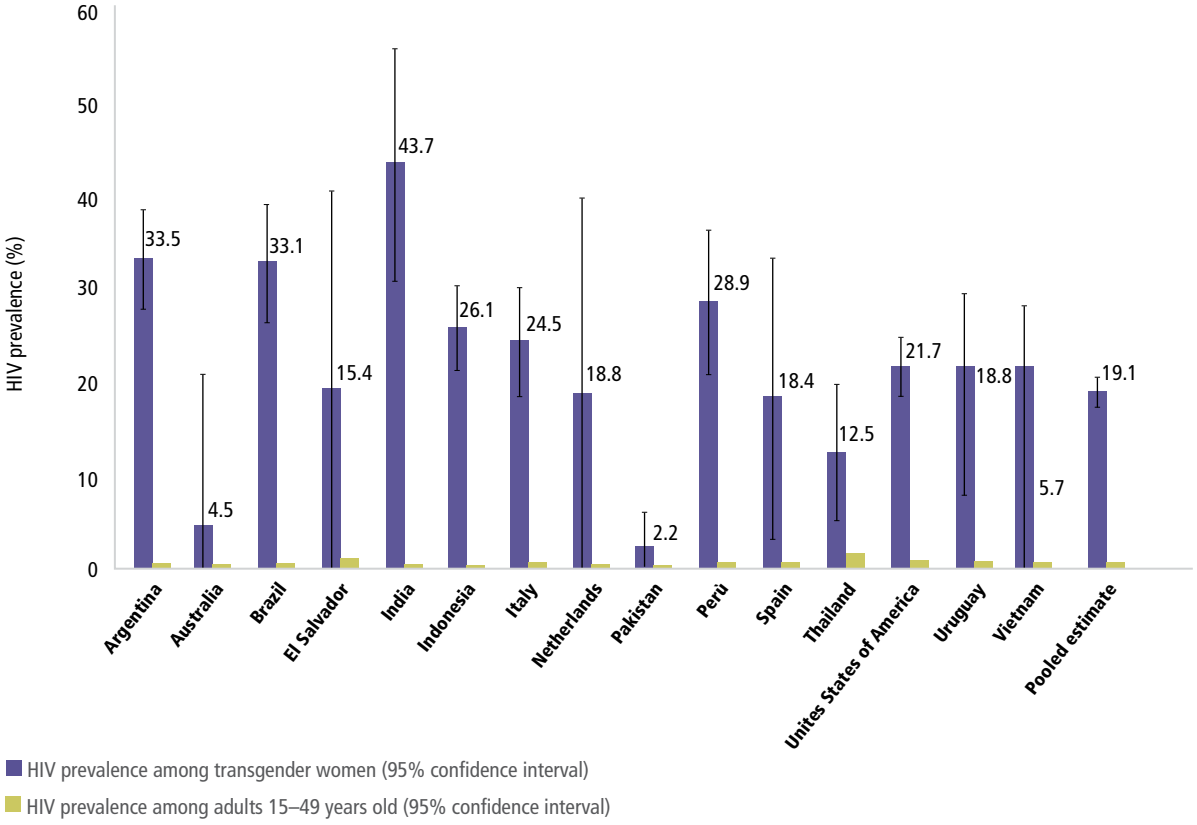
Coverage of HIV prevention services among men who have sex with men also varies between regions. In the WHO African Region, for example, specific government-sponsored HIV services for men who have sex with men are very scarce. A generally hostile context also makes it difficult, even dangerous, for nongovernmental organizations to provide services for this population group *(47)*: indeed, only three countries in the Region (Madagascar, Rwanda and South Africa) do not have legal provisions that criminalize sex between men *(38)*. Limited funding and discriminatory laws and practices impede – and, in some countries, explicitly prevent – efforts to reach men who have sex with men with effective HIV prevention, treatment and care services *(37)*.

Strong community involvement and social support are essential components of HIV responses among men who have sex with men. It is also important to integrate services for this population group with other existing health services *(48)*. ARV drugs, including early treatment and pre-exposure prophylaxis, are important additions for combination prevention but are most effective if used as part of strategies that address structural barriers, such as stigmatization (including within health systems), violence and criminalization *(46)*. Being applied more widely, as well, is an approach that offers a comprehensive package of prevention choices for men who have sex with men, including condoms and condom-compatible lubricants, increased HIV screening and counselling, treatment of sexually transmitted infections, early ART for men who test HIV-positive and pre-exposure prophylaxis *(49)*.

7.3 … and transgender people are being neglected

The HIV needs of transgender people continue to be largely neglected or ignored, despite the high burden of HIV among transgender people, particularly transgender women. Transgender people are rarely included in national HIV surveillance systems, but the data that are available show them to be at exceptionally high risk of HIV infection *(50)*. A meta-analysis of data from 39 studies in 15 countries (10 low- and middle-income countries and five high-income countries) in the WHO Region of the Americas, South-East Asian Region, Western Pacific Region and European Region *(51)* has shown a global, pooled HIV prevalence of 19% among transgender people, many times higher than the HIV prevalence estimated for the general adult population (0.4%).[1] In some countries, the HIV prevalence among transgender women exceeded 30% (Fig. 7.3). Overall, in the 15 countries for which data exist, transgender women are 36 times more likely to be living with HIV than adult men and 78 times more likely to be living with HIV than other adult women *(51)*.

Figure 7.3. Aggregate HIV prevalence among transgender women in selected countries, 2000–2011



Source: Baral SD et al. (*51*).

This elevated risk of HIV infection reflects a high prevalence of unprotected high-risk sex and poor access to effective prevention services and commodities *(52,53)*. Transgender women urgently need prevention, possibly including pre- and post-exposure prophylaxis, and tailored support and care. Instead, transgender women experience severe stigma and social discrimination (especially in health care settings) *(54)* and appear to be frequent victims of violence (see Chapter 11) *(51)*. Given other health and socioeconomic priorities in their lives, such as challenges in accessing hormone therapy, work and basic social services, many transgender people may not consider HIV a priority issue for them. Few health care workers have received training for addressing the specific health-related needs of transgender women. Consistent access to suitable clinical prevention, treatment or care services is rare, especially in low- and middle-income settings, although also in many high-income settings *(55,56)*. Such experiences have prompted transgender women to organize in growing

[1] Ten of the studies were in low- and middle-income countries and five were in high-income countries.

numbers to assert their rights and advocate for their full inclusion in HIV responses. The sexual orientation and gender identity strategy of the Global Fund to Fight AIDS, Tuberculosis and Malaria is an example of the increasing success of such efforts *(57)*. More generally, where possible, HIV interventions should be made available at the health and social services transgender people use most widely.

7.4 Lack of political will still blocks comprehensive services for people who inject drugs

People who inject drugs are estimated to comprise 5–10% of the people living with HIV globally *(58)*. The prevalence of HIV infection in this population ranges from an estimated 6–10% in western and central Europe, the Americas and central, south, east and south-east Asia to 23% in eastern Europe and 29% in south-west Asia (mainly Pakistan) (Table 7.2) *(22)*.[2]

Nevertheless, even in countries where people who inject drugs comprise large proportions of the people living with HIV, the political commitment and programmatic efforts to reduce HIV transmission in this key population generally remain weak *(59)*. Services to prevent HIV infection among people who inject drugs are limited and erratic in quality in most countries, especially in the WHO African Region *(38)*.

As a consequence, about 1.7 million [0.9 million–4.9 million] of the estimated 12.7 million [9.0 million–22.4 million] people who inject drugs globally are believed to have acquired HIV (Table 7.2) *(22)*. An estimated 62% of all people who inject drugs and who have acquired HIV reside in four countries: China, Pakistan, the Russian Federation and the United States of America *(22)*.

Reducing the risks of injecting drugs by providing sterile equipment is a relatively easy and inexpensive strategy for HIV prevention, and it has been shown to be highly effective *(60,61)* – especially when backed with structural interventions such as changes in policies, laws, regulations and law enforcement practices *(62)*.[3]

Other recommended services include access to HIV testing and counselling, opioid substitution therapy for people dependent on opioids, ART and other health and social services. People who inject drugs and their sexual partners also require services that address coinfections such as TB and viral hepatitis as well as HIV counselling, education, behavioural interventions and access to condoms to prevent sexual transmission *(37)*.

Needle and syringe programmes have expanded in some countries with great HIV burdens among people who inject drugs (including Ukraine and some countries in Asia, including Bangladesh and Indonesia) *(63)*. About 86 countries and territories were implementing needle and syringe programmes to varying degrees in 2012, including three (Lao People's Democratic Republic, South Africa and the United Republic of Tanzania) that had newly established such projects *(63)*. Models of needle and syringe provision range from specialist needle and syringe programme sites to community-based outreach or the use of pharmacies and vending machines. However, in most low- and middle-income countries, service coverage levels are not sufficient to stabilize or reverse HIV epidemics in this population *(22)*.

According to estimates by the United Nations Office on Drugs and Crime, in 2013 less than 20% of people who inject drugs were being reached with needle and syringe programmes in about half (49%) of the 83 countries reporting these data. In only one quarter (26%) of those countries did more than 60% of the people who inject drugs have access to needle and syringe programmes *(22)*. The quantities of needles and/or syringes being distributed were also low: only 10 of the 55 reporting countries managed to distribute 200 or more needles and syringes per year per person who injects drugs *(22)*, most of them in western and central Europe (although relatively high service coverage has also been reported in a few others, such as Australia and Bangladesh, in the recent past) *(63)*. Needle and syringe programmes were reaching small proportions of people who inject drugs in the Americas and in east, south-east and south-west Asia.

Despite the low coverage of public-sector harm-reduction programmes, some surveys indicate that increasing numbers of people who inject drugs report using sterile equipment. In North America and Europe, for example, survey data indicate that at least 70% of people who inject drugs used sterile equipment during their most recent episode of injecting drug use. In 2012, according to the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS), 23 of 40 countries reported having reached the global target of 80% for use of sterile injecting equipment during the most recent episode of injecting drug use. Many people who inject drugs in these countries may obtain clean needles and syringes through channels other than needle and syringe programmes.

Opioid substitution therapy reduces the frequency of injecting among opioid users and therefore plays a key

[2] The data derived from the *World drug report 2014 (22)* are presented here according to the regions used in that report, which differ from the WHO regions.

[3] This review of 15 studies *(62)* found that comparatively low coverage can provide significant public health benefits: for example, when more than 50% of the injecting population in a community receive at least 10 or more sterile syringes per year.

Table 7.2. Estimated prevalence of HIV infection among people who inject drugs, 2013

		HIV among people who inject drugs			
Region	**Sub-region**	**Estimated number**			**HIV prevalence, best estimate (%)**
		Low	**Best**	***High***	**%**
Africa		24 000	123 000	2 006 000	12.1
America		197 000	267 000	421 000	8.6
	North America	148 000	189 000	254 000	9.2
	Latin America and the Caribbean	49 000	79 000	167 000	7.4
Asia		331 000	556 000	966 000	12.0
	Central Asia and Transcaucasia	26 000	31 000	41 000	7.7
	East and South-East Asia	196 000	312 000	596 000	9.6
	South-West Asia	88 000	188 000	298 000	28.8
	Near and Middle East	1 000	3 000	8 000	3.8
	South Asia	20 000	21 000	22 000	8.4
Europe		364 000	719 000	1 434 000	19.1
	Eastern and South-Eastern Europe	320 000	667 000	1 368 000	23.0
	Western and Central Europe	44 000	52 000	66 000	6.0
Oceania		1 000	1 000	2 000	1.0
Global		917 000	1 667 000	4 828 000	13.1

Source: *World drug report 2014 (22).*

The data in this table are presented according to the regions used in the *World drug report* 2014 *(22)*, which differ from the WHO regions.

role in preventing the acquisition and transmission of HIV through sharing of injecting equipment and drug solutions. Worldwide, 79 countries reported offering opioid substitution therapy in 2013, but two thirds were providing it to 40% or less of the opioid-dependent people who inject drugs *(22)*. In the Islamic Republic of Iran, for example, where injecting and non-injecting opiate users have access to opioid substitution therapy, reported coverage was 36% according to the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS). An increasing number of countries and territories are providing opioid substitution therapy, however; Bangladesh, Cambodia, Kenya, Kosovo (in accordance with Security Council resolution 1244, 1999), Tajikistan and the United Republic of Tanzania have introduced opioid substitution therapy services since 2010 *(63)*. Nevertheless, coverage has stayed generally low, and improvements in scale and quality are needed to boost the impact of these interventions. The same applies to other HIV-related services for this key population.

According to the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS), in all countries, the median proportion of people who inject drugs who reported using a condom the last time they had sex was less than 40% in 2013 *(37)*. Preventing sexual transmission of HIV in this key population therefore remains a challenge, as does identifying the people who have acquired HIV so that they can access ART. In 2013, about 40% of the 83 reporting countries stated that at least 75% of the people who inject drugs had been tested for HIV in the previous 12 months and knew the result, including several countries in east and south-east Asia *(22)*.

Determining the extent to which people who inject drugs and have acquired HIV are accessing ART remains difficult (Box 7.4). Earlier estimates, often based on localized studies, indicated that ART coverage in this population group is disproportionately low compared with other key populations, especially in low- and middle-income countries *(64)*. In Punjab, Pakistan, for example, according to the Punjab AIDS Control Programme, less than 100 of the estimated 24 200 people who inject drugs and had acquired HIV were receiving ART in 2013. However, globally among the 74 countries reporting these data in 2013, 37% stated that at least 75% of the people who inject drugs and were living with HIV were receiving ART, many of them in western and central Europe *(22)*.

The global service coverage estimates appear to be skewed by the comparatively high coverage in western and central Europe, where 50–60% of the reporting countries indicate that large proportions of people who inject drugs are accessing needle and syringe programmes, opioid substitution therapy, HIV testing and counselling and ART services *(22)*. Coverage appears to be considerably lower and sometimes entirely absent in many low- and middle-income countries with many people who inject drugs.

In addition to the many legal and social barriers that block access to HIV and other health services, the separate management of TB, HIV, viral hepatitis and harm-reduction services for people who inject drugs poses an added hindrance in many countries *(65)*. ART provision needs to be better integrated with harm-reduction services (including opioid substitution therapy) and services for preventing and treating TB and viral hepatitis *(64,66)*. According to the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS), three countries in the eastern part of the European Region have integrated delivery of opioid substitution therapy in ART settings, three more plan to do so by 2015, two countries have integrated opioid substitution therapy in TB clinics and three more countries plan to include it in their national policies by 2015. Coordinated and tailored service delivery models and peer involvement in service delivery will help widen access to these interventions.

Similar to other key populations, prevention programmes for people who inject drugs rely strongly on international donor funding. This remains true in regions in which injecting drug use is the major mode of transmission for HIV, such as the eastern part of the WHO European Region and in the WHO South-East Asia Region *(37)*. Many of the countries most affected by HIV epidemics among people who inject drugs are transitioning to upper-middle-income status and may no longer be eligible for international development assistance that has been critical for funding such programmes, and domestic government funding to fill such gaps may not be given priority.

Box 7.5. Filling gaps in the data

Although improving, HIV data for people who inject drugs and their access to HIV and harm-reduction services are still incomplete. Among the four countries estimated to contain almost half of the people who inject drugs globally *(67)*, for example, only Brazil and China reported relevant data for 2012 (whereas the Russian Federation and the United States of America did not). The absence of complete, reliable data makes it difficult to design, fund and implement the evidence-informed strategies that are needed to achieve the goal of halving the number of people who inject drugs newly infected with HIV *(37)*.

7.5 HIV services are lacking in prisons and other closed settings

Like all other people, prisoners have a right to enjoy the highest attainable standard of health and to access a range and quality of health services of the same standard as are available in the broader community. Reliable data on HIV prevalence among prisoners are scarce. However, behaviour that carries a high risk of HIV infection (including unprotected sex, injecting drug use and the use of non-sterile tattooing and other skin-piercing instruments) is common in prisons and other detention settings, and the available data reveal a high HIV prevalence in many countries *(68)*. Since many types of behaviour of key populations are criminalized, these populations tend to be overrepresented in prison settings, which then concentrate populations with both high HIV prevalence and multiple types of HIV risk behaviour in closed environments. HIV in prisons poses major challenges for providing continuity of care, as individuals move from their communities into pre-trial detention and then imprisonment and then are released back into their communities. Such transitions can result in interruptions in ART, opioid substitution therapy and other treatment.

Surveys in prisons and detention centres have found HIV prevalence as high as 27% in Zambia *(69)*, 11% in Uganda *(70)*, 19% in Ukraine *(71)*, 7% among some

prison populations in Kyrgyzstan *(72)*, 7% in southern Brazil *(73)* and 14% among female prisoners in Togo *(74)*. It has been estimated that more than half of prisoners' deaths in Zimbabwe and more than a quarter in Malawi are HIV-related *(75)*. Overcrowding and poor ventilation also increase the risk of TB transmission in places of incarceration *(76,77)*. The average TB incidence in prisons worldwide has been estimated to be more than 20 times higher than in the general population *(78,79)*.[4]

National HIV surveillance systems generally do not separate data on the provision and coverage of HIV services in prisons as opposed to the wider community. This makes it difficult currently to arrive at an accurate picture of service provision in prisons and other closed settings in many countries.

Even though HIV prevention services, including condom provision, are recommended for prisoners *(80)*, they appear to be rare. In Ukraine, for example, fewer than 10% of prisoners have access to information about HIV, the means for protecting themselves against infection (including access to condoms and clean needles and syringes) and opportunities to voluntarily take an HIV test *(81)*. In addition to inadequately resourced prison health care services and frequent rights violations *(82)*, the criminalization of such behaviour as sex between men in some countries and (injecting) drug use in most countries increases overcrowding and further hinders access to prevention and treatment services in prisons *(83)*.

Much can be learned about the HIV situation in closed settings by reviewing seropositivity rates from testing services and the numbers of people enrolled in care and treatment. Thus, when HIV testing and counselling services were expanded from 26 to 36 prisons in Kenya in 2009–2010, the 48 525 individuals who took an HIV test had an HIV prevalence of 5.7% *(84)*. During a 2008–2010 rollout of HIV testing and counselling in 10 large prisons in Cameroon, the HIV prevalence ranged from 2.3% to 9.1% among new entries *(85)*, while an HIV testing and counselling programme implemented in five Zambian prisons between January and September 2011 found an HIV prevalence of 11.9% among first-time testers *(86)*.

According to the United Nations Office on Drugs and Crime, in 2013, needle and syringe programmes were provided in prisons in only eight countries: Afghanistan (a pilot project), Germany (one prison only), Kyrgyzstan, Portugal (pilot project), the Republic of Moldova, Spain, Switzerland and Tajikistan. Information on the provision of opioid substitution therapy in prisons is available only for 2012, when about 43 countries, most in Europe and the Americas, were providing this service *(63)*. Elsewhere, harm-reduction services available in prisons in Malaysia include methadone maintenance treatment.

Mauritius is among the few low- and middle-income countries known to provide ART in prisons; in Viet Nam, ART has been available in administrative detention centres *(37)*. Even in the WHO European Region, access to harm-reduction services in prison settings remains a challenge, although recent efforts to strengthen linkages between prison and public health services reflect growing concern about the need to prevent HIV transmission among people passing through countries' criminal justice systems *(87)*.

ART provision in prisons and closed settings often depends on donor funding and other external support, which may compromise their sustainability. Indeed, HIV testing, prevention, care and treatment services in prison systems are often provided based on collaboration with public health offices, universities and nongovernmental organizations.

7.6 The health needs of people living with HIV older than 50 years are becoming more challenging

HIV among older people is an increasingly important issue, since the number of people with HIV who live into and beyond their fifties increases *(88)*. Already well established in high-income countries, the trend is becoming increasingly visible in the rest of the world. This "ageing" of the epidemic mainly results from two factors: the success of ART in prolonging the lives of people living with HIV, and the often-overlooked fact that older adults are also sexually active and might also be injecting drugs and therefore at risk of HIV infection.

In 2012, about 10% of the global adult population living with HIV was 50 years or older in low- and middle-income countries – the largest proportion since the beginning of the HIV epidemic. That proportion was 6% in the WHO South-East Asia Region, 7% in the WHO Eastern Mediterranean Region, 9% in the WHO Western Pacific Region as well as in the WHO African Region, 15% in the WHO Region of the Americas, and 17% in the WHO European Region *(89)*.

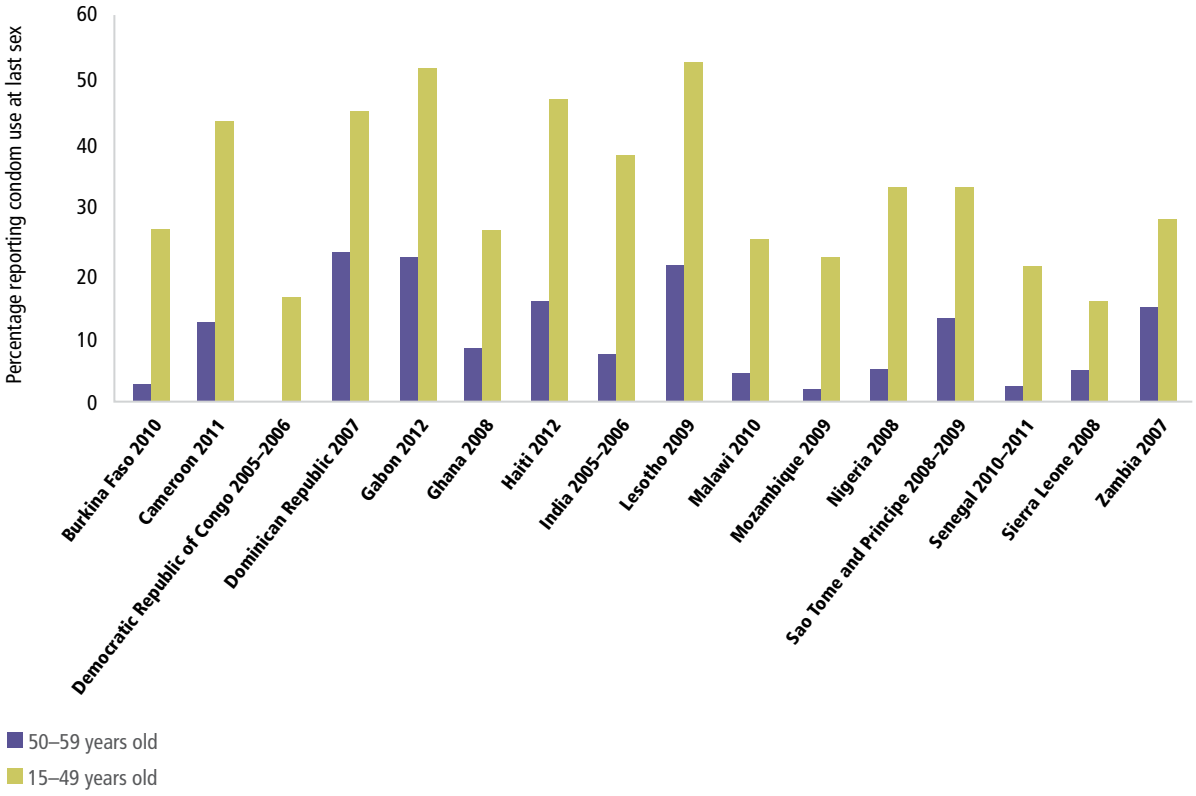
[4] In the WHO European Region, the only WHO region to systematically collect data on TB in prisons, TB case notification rates are 4 to 180 times higher than in the general population *(79)*.

In addition, according to UNAIDS/WHO, about 77% of the estimated 100 000 adults 50 years or older who acquire HIV globally annually live in the WHO African Region. Modelling indicates that older adults will account for a steadily growing proportion of people living with HIV in the African Region *(90)*.

HIV prevention services – and other services, such as TB screening – therefore need to increasingly emphasize older adults (including older people belonging to key populations) and their specific realities and needs.

Very few HIV strategies in low- and middle-income countries explicitly address this dimension of the HIV epidemic *(91)*. There are indications that older adults may know less about HIV than younger people, as shown in surveys done in nine sites in western, eastern and southern Africa; awareness was especially low among the older women *(92)*. Many people remain sexually active in older age and therefore continue to be at risk of acquiring and transmitting HIV. In a study conducted in Uganda in 2013 with people 50 years and older who were living with HIV, for example, half (49%) the male respondents reported being sexually active *(93)*. Nevertheless, as Fig. 7.4 illustrates, in a range of countries the proportions of men 50–59 years old who reported using a condom the last time they had higher-risk sex were consistently and often considerably lower than among men 15–49 years old.

Figure 7.4. Percentage of men 15–49 years old and 50–59 years old with multiple sexual partners in the previous 12 months reporting condom use the last time they had sex, selected countries, 2006–2013



Source: Albone R. Including older women and men in HIV data. London: HelpAge International, 2013 *(94)*.

Significant numbers of people 50 years and older are requiring ART, and timely initiation of ART is especially important for them because their immune systems tend to recover more slowly compared with younger people *(91)*. Data from ART programmes in nine countries in the WHO African Region (Central African Republic, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Ethiopia, Nigeria, Uganda, Zambia and Zimbabwe) show that more than 1 in 10 people initiating ART were 50 years and older – and indeed mortality among them was higher than for other adults receiving ART (*95*).

Underlining these findings is a new study by HelpAge International in four countries in eastern and southern Africa *(96)*: people 50 years and older who are living with HIV do not have equitable access to ART compared with younger counterparts.

Part of the reason may be that older adults are less likely to take an HIV test than people younger than 50 years, according to research in the WHO African Region *(92,97)*, and may therefore eventually present for HIV treatment in very poor health. In addition, ART in older

adults can pose special challenges *(95)*, including the increased likelihood of other chronic conditions, including noncommunicable diseases, notably ischaemic heart disease, diabetes and non-HIV cancer, along with mental health disorders. Meanwhile, in high-income countries, increased mortality among older people living with HIV is often attributed to increased prevalence of non-AIDS-defining illnesses such as cardiovascular disease and kidney and liver failure *(91)*, which may worsen the progression of HIV disease *(98)*. Older people living with HIV also appear to have a greater risk of acquiring infectious diseases, such as TB *(99)*. There is a clear but largely unmet need for improved knowledge of the efficacy regimens in various age groups, comorbidity issues that are related to the ageing process and closer integration of ART with the care systems for other chronic and noncommunicable diseases *(90)*.

7.7 Providing other essential support for people living with HIV

In addition to the comprehensive HIV prevention, treatment and care interventions that should be made available to people living with HIV, they also need to be able to access a broader range of health care services and general care interventions most relevant to the prevalent health issues in various communities. In addition, the impact of HIV services often depends on the existence of other forms of support and services that address the underlying or associated factors that cause vulnerability. For example, because people living with HIV have compromised immune status, access to safe water and sanitation, safe and nutritious food and prophylaxis against common infections, such as malaria, are critical key components of a broader prevention and care package for people living with HIV *(100)*.

The combination of malnutrition and infectious diseases such as HIV has a devastating effect on mortality in many countries around the world, making it crucially important to integrate nutritional and HIV interventions. People living with HIV receiving food assistance have been shown to have higher ART adherence than other people living with HIV *(101)*. Conversely, food insecurity has been shown to be associated with poor HIV outcomes *(102)*.

Chapter 8. LEVERAGING BROADER HEALTH OUTCOMES THROUGH HIV RESPONSES

Key Messages

The HIV response is boosting other public health services

Wide-ranging improvements are being seen in the access to, coverage of and quality of services as HIV services are adapted, linked and integrated with other health programmes and services – but further improvements beckon.

- More than half of 105 countries reported that they had either fully integrated or strengthened joint provision of HIV and TB services in 2012.
- In 2013, slightly more than half the 58 WHO HIV focus countries said they had integrated their TB and ART services, and ART was being provided in TB clinics in less than half of them.
- Links with maternal, newborn and child health programmes are getting stronger. About 70% of 118 countries reported in 2012 that they had integrated HIV testing and counselling and ARV drug provision within antenatal care services.
- HIV testing is being linked to a varying extent with child immunization services and is being offered in paediatric inpatient wards, nutrition support programmes, community childcare services and other child health services.
- Two thirds of 118 countries reported in 2012 that they had linked or integrated HIV in their sexual and reproductive health services. But the unmet need for family planning is still high among women living with HIV.
- HIV continues to change the wider health landscape. The spillover effects include stronger health service management for chronic care, innovations that link and retain people more reliably in long-term care, and strengthened community systems
- Women living with HIV have a high risk of cervical cancer, which is preventable and curable. But in some places, including in the countries of eastern and southern Africa with a high burden of HIV infection, coordinated national efforts to address the disease are scarce.

A significant shift is underway towards integrating and linking HIV services more closely with other health programmes and services as well as with other development sectors. Studies indicate that such integration tends to lead to improved access, coverage and acceptability of HIV services and to the sustainability of services in the longer term.

Improvements have been found in relation to TB and HIV services *(1,2)*, linking HIV with maternal, newborn and child health care services *(3,4)*, linking HIV and chronic noncommunicable diseases *(5,6)*, linking HIV and harm reduction and services for treating drug dependence and integrating HIV services with primary health care and overall health and community systems *(7,8)*. In addition to improving access to health services, integrated service delivery models may also reduce unit costs *(9,10)*.

According to the WHO HIV Country Intelligence Database, by June 2014, more than half the 58 surveyed focus countries reporting these data stated that they had strongly linked fully integrated HIV and TB service provision by providing TB treatment in ART services and ART in TB clinics; about 40% were offering hepatitis B and C testing in ART clinics, and about 80% were offering HIV testing and counselling in all encounters, including in sexual and reproductive health services and primary health care settings. Examples include integrating HIV and sexually transmitted infection services in primary care in the Bahamas; integrating ART at maternal and child health facilities in Mozambique, Swaziland, Uganda, the United Republic of Tanzania and Zambia; a coordination mechanism set up in Nepal to integrate reproductive health services in HIV programmes; delivering ART within primary health care settings in Namibia; integrating services to prevent the mother-to-child transmission of HIV and HIV care for children into routine maternal and child health services in Swaziland; and Brazil integrating HIV and primary care services at all levels in its public health services *(10)*.

The 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection *(11)* recommend delivering ART in maternal, neonatal and

child health care services in generalized epidemic settings; in TB care where the burden of TB and HIV is high; and, when provided, in opioid substitution therapy settings for people who use drugs *(11)*. The potential impact of such provision is huge: a recent modelling *(12)* study concluded that ART, for example, might have averted as many as 900 000 cases of opportunistic infections globally in 2012 alone, with annual cost savings of US$ 32.7 million.

However, decisions on whether to link certain services (for example by co-locating them) or to go a step further and fully integrate them need to be carefully considered. Factors such as the disease burden in a particular setting, the epidemiological context and the state of health care delivery systems should be taken into account. In some settings, referral links tend to be more appropriate, acceptable, effective and efficient than fully integrating services.

In addition, there is little rigorous analysis of how best to integrate HIV services with other health programmes and how to measure the effectiveness of integration *(9)*.

Assessing and analysing the performance of various models of integration more systematically can reduce this knowledge gap. Indicators for gauging the integration of HIV into general health and development sectors are needed, as are methods for monitoring the implications of integrating services at the health system level, such as on monitoring and evaluation, supply management and human resources systems *(13)*.

Meanwhile, countries that do decide to pursue integration of services often encounter structural barriers. For example, even when numerous services are packaged and delivered as one-stop arrangements at the primary care level, programme management at the district level sometimes remain separate. On-the-job training of health workers, supportive supervision, monitoring and evaluation and programme reviews also are not always coordinated across different programmes. Donor policies and practices that require disease-specific funding streams and reporting mechanisms also continue to pose hurdles, according to countries in which integration activities are lagging *(10)*.

8.1 TB and HIV activities are being linked and integrated more closely

Reducing TB morbidity and mortality among people living with HIV requires a range of interventions, many of which are highly amenable to be integrated (see Chapter 6). The latest available data from the Global AIDS Response Progress Reporting show that, in 2012, 53% of 105 countries reported that they were either fully integrating HIV and TB services or strengthening joint service provision (Table 8.1, Box 8.1). Their approaches varied, ranging from fully integrated, one-stop-shop service delivery models to adding specific services, such as TB screening and diagnostic services in HIV clinics.

8.1.1 HIV testing and counselling is being integrated with TB services

HIV testing and counselling are increasingly being linked and integrated with TB services, but this is not yet routine (Fig. 8.1; see Chapter 6) *(10)*. Progress was strongest in the WHO African Region, where the Global Tuberculosis Programme Database shows that 76% of notified TB cases were tested for HIV in 2013, up from 69% in 2011 –

Table 8.1. Provision of collaborative TB/HIV activities globally and in the WHO African Region, 2013

Key indicator	Global	African Region
Percentage of TB patients with known HIV status	48%	76%
Percentage of people with TB and HIV who received ART	70%	69%
Percentage of people with TB and HIV who received co-trimoxazole preventive therapy	82%	83%
Number of people living with HIV screened for TB	4.7 million	3.5 million
Number of newly identified people living with HIV offered isoniazid preventive therapy	498 000	467 000

Source: Global AIDS Response Reporting (WHO/UNICEF/UNAIDS) and Global Tuberculosis Programme Database, June 2014 *(14)*.

Box 8.1. WHO guidance and support for integrating TB and HIV services

WHO continues to refine the normative guidance for TB and HIV activities and to promote the integration of TB and HIV services. In 2012, WHO revised the guidance on collaborative TB and HIV activities based on a comprehensive review of the evidence *(15)*. This followed on the 2011 release of guidance for intensified TB case-finding and isoniazid preventive therapy *(16)* as well as guidance and policies related to a new molecular diagnostic test for TB, including for people living with HIV *(17)*.

In both the 2012 collaborative TB and HIV policy document *(15)* and the 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection *(11)*, countries are encouraged to offer ART in TB clinical settings and TB treatment in HIV care and treatment settings, ideally using a one-stop model that provides services to people with HIV and TB. In addition, WHO supported workshops on integrating TB and HIV with key stakeholders such as the Global Fund to Fight AIDS, Tuberculosis and Malaria and the United States President's Emergency Plan for AIDS Relief in southern Africa (in 2013), western Africa (in 2012) and Asia (in 2012).

WHO is revising guidance to promote the integrated management of TB, HIV and viral hepatitis in people who inject drugs (due in 2014), and it is working to ensure that TB and HIV are included in existing guidance related to key populations. In addition, WHO has expanded its work covering other risk groups, including a high-level effort to address TB in the mining sector in southern Africa and to devote greater attention to preventing and treating TB and HIV among children and women, including providing linked services in maternal, newborn and child health care settings as well as for prisoners and for health workers.

indicating that important coordination mechanisms are in place *(14)*. In East Asia and in South and South-East Asia, home to one in six people with both TB and HIV globally, HIV testing coverage for people with TB was low (31% and 36%, respectively, in 2012) *(10)*.

8.1.2 HIV treatment for people with TB is expanding but lags behind overall ART provision

WHO recommends ART for all people coinfected with TB and HIV, irrespective of CD4 cell count – in addition to scaling up ART at the population level, which will reduce the risk that people living with HIV develop TB *(18)*. In mid-2013, most reporting countries (87% of 118 countries) were recommending ART for all people with TB *(19)*.

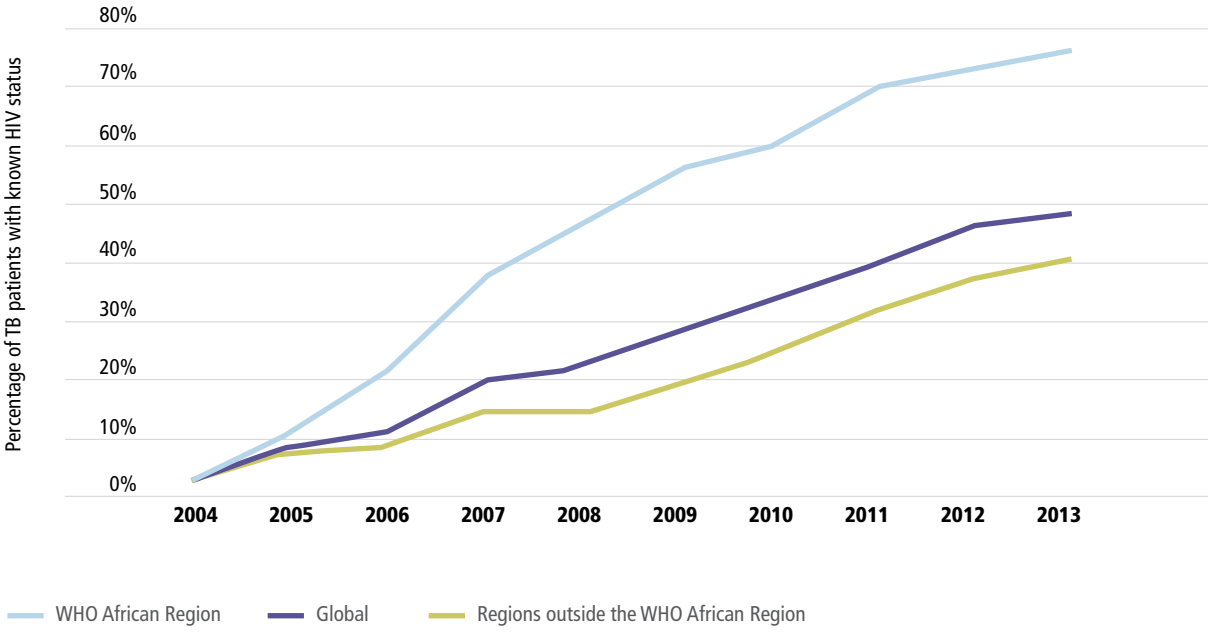
The number of people with both HIV and TB receiving ART has risen encouragingly since 2009 (see Chapter 6), and at least 10 countries with a high burden of TB and HIV coinfection have reached or exceeded 75% coverage of ART among people with TB *(20)*. In South Africa, more than 120 000 individuals living with both HIV and TB were receiving ART in 2012. Coverage of ART for identified people with both TB and HIV rose by 50% from 2012 to 2013 in India, by 35% in the United Republic of Tanzania, 33% in Uganda, 31% in Viet Nam and 30% in Mozambique, according to the Global Tuberculosis Database and the 2014 Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS). Nevertheless, ART coverage for people with TB was very low – under 40% – in some of the 41 priority TB/HIV countries.

Those data suggest that the integration of TB and HIV care remains uneven. Indeed, according to the WHO HIV Country Intelligence Database, 57% of the 58 focus countries said in 2014 that they had integrated their TB and ART services, and ART was being provided in TB clinics in less than half (25 of 58) of them (Table 8.2). The unevenness also occurs within regions and countries, with service integration often strong in some facilities or districts yet weak in others.

Major opportunities are being missed. When decentralized and integrated TB and HIV care is provided, service uptake tends to increase and overall outcomes improve, as indicated in a study from Swaziland *(21)*, where treatment success rates for bacteriologically confirmed TB improved from 68% in 2009 to 77% in 2012 in the Shiselweni region despite very high levels of HIV coinfection *(22)*. The results from a study in South Africa *(23)* showed that delivering integrated TB and HIV services increased the chances of people with TB to receive ART by 60% and shortened the treatment initiation time by 72 days. Nevertheless, successful integration can be challenging. In a three-year study of more than 2300 people with TB at Malawi's largest integrated public TB and HIV clinic, for example, 96% of the people with TB knew their HIV status, but only 38% of people living with HIV who were newly smear-positive received ART during TB treatment *(24)*. Concerns about the pill burden and possible drug interactions and inadequate coordination of staff responsibilities were among the challenges *(24)*.

The Board of the Global Fund to Fight AIDS, Tuberculosis and Malaria recently decided to request countries with high burdens of TB and HIV to submit unified TB and HIV concept notes as part of their funding applications. This offers an

Fig. 8.1. Percentage of TB patients with known HIV status, 2004–2013



Source: Tuberculosis Programme Database, June 2014 *(14)*.

opportunity to give priority to harmonizing the delivery of integrated TB and HIV services and to coordinate them with programmes such as maternal, newborn and child health and harm-reduction services (Box 8.3).

WHO is also developing technical guidance and support for more effective collaboration and integration. It will present guidance on the joint management of TB and HIV for specific populations and settings, including links with harm reduction and prison health programmes.

Table 8.2. Provision of TB treatment in ART settings and provision of ART in TB clinics in 58 WHO HIV focus countries

Region	Total focus countries	TB treatment in ART settings		ART in TB clinics	
		n	%	*n*	%
African Region	24	15	63%	16	67%
Region of the Americas	10	5	50%	2	20%
Eastern Mediterranean Region	8	5	63%	2	25%
European Region	6	2	33%	4	66%
South-East Asia Region	5	3	60%	0	0%
Western Pacific Region	5	3	60%	1	20%
Total	58	33	57%	25	43%

Source: WHO HIV Country Intelligence Database, as of June 2014.

Box 8.2. Assessing the impact of integrated TB and HIV services

Major efforts have been made in recent years to improve the quality of TB and HIV data. Indicators being used by TB and HIV programmes have been standardized, and responsibilities for data collection related to TB and HIV interventions have been clearly defined. WHO and UNAIDS, in collaboration with various partners, supported countries in ensuring complete and consistent reporting and in reconciling discrepancies between the data reported by TB and HIV programmes. However, some challenges remain.

- The denominators required to calculate the coverage of TB screening and isoniazid preventive therapy among people living with HIV (people registered in HIV care for screening and isoniazid preventive therapy, respectively) are still missing or inaccurate in some places.

- National TB programmes and national HIV programmes in several countries report discrepant figures for the numbers of people with both HIV and TB who are receiving ART. In 32 countries, the numbers reported by the two programmes differed in both 2011 and 2012. Subsequent verification resolved the discrepancies in most but not all cases. The problem can be avoided by improving systems for recording and reporting data and by further strengthening collaboration and communication between national TB programmes and HIV programmes *(14)*.

Currently, most TB and HIV programmes report chiefly on service coverage – for example, the proportion of people with TB who were tested for HIV. Evidence of the eventual impact – such as the outcomes of TB treatment or ART and the effect on mortality – is still relatively scarce. In addition, very few studies have explored the experiences of service users and staff or examined costs or cost-effectiveness in different settings.

Box 8.3. Supporting stronger collaboration between HIV and TB programmes

As part of the Treatment 2.0 initiative, WHO provides guidance on integrating HIV with other health services. In particular, WHO is leading efforts in many countries to support national programme reviews of TB that include HIV and programme reviews of HIV that include TB. In September 2013, WHO supported a joint TB and HIV programme review of the world's largest ART programme (and one of the largest TB programmes) in South Africa. The decision by the Board of the Global Fund to require a single concept note for TB and HIV funding proposals in 41 countries with a high burden of TB and HIV implies a need for countries to work more closely on joint programme reviews, joint national strategies and other shared activities.

In addition, WHO is supporting improvements in several other areas.

Improved drug formulations
WHO worked on including a co-formulated tablet of co-trimoxazole, isoniazid and pyridoxine (already on the Expression of Interest List) in the Model List of Essential Medicines in 2013. Although that request was not approved, efforts are ongoing to encourage manufacturers to produce a fixed-dose combination tablet.

Development of a robust research agenda
WHO continues to play a key convening role in promoting a research agenda via its leadership of the TB/HIV Working Group and by organizing joint TB and HIV events at key scientific meetings.

Strengthened tools to prevent and manage HIV and TB coinfection
WHO is promoting expanded integration between HIV and TB services via its 12-point policy on collaborative TB and HIV activities. Key actions include:

- producing clinical guidelines and supporting the use of operational tools for TB prevention and treatment in HIV care settings, including applying "the three I's" (see Chapter 6); and

- promoting co-packaging, co-formulation and use of isoniazid and co-trimoxazole combinations to prevent TB and other opportunistic infections among people living with HIV.

Improved diagnostics
WHO recommends a new molecular test (Xpert MTB/RIF) (see Chapter 6) for diagnosing TB as a first test for people living with HIV. Along with its partners, WHO is working to ensure that this test is available for people living with HIV via TB services and in settings where HIV care is being provided.

8.2 Links with maternal, newborn and child health programmes are being strengthened

There are major opportunities to achieve greater impact by making HIV services part of the core interventions for maternal, newborn and child health services, especially in settings with a high prevalence of HIV infection. Among the more obvious examples is integrating services for preventing the mother-to-child transmission of HIV into antenatal care. In 2012, 70% of the 118 countries that reported data stated that they had integrated HIV testing, counselling and providing antiretroviral drugs within antenatal care services to prevent the mother-to-child transmission of HIV *(10)*.

Achieving such integration can lead to impressive results. A systematic review of 10 studies, 7 from the WHO African Region, found that introducing provider-initiated testing and counselling in antenatal care settings increased HIV testing uptake by between 10% and 66%, with uptake exceeding 85% in 8 of the studies *(25)*. Separate data from Swaziland showed that linked service delivery at one facility increased the proportion of pregnant women tested for HIV during their first antenatal clinic visit from 87% in 2011 to 100% in 2013 *(26)*.

Integrating ART into antenatal clinics also tends to increase ART enrolment and ART coverage, as indicated in a systematic review of studies from Jamaica, Mozambique, Rwanda and Zambia *(4)*. However, not enough countries are taking advantage of the benefits of integrating ART with maternal, newborn and child health services. According to the WHO HIV Country Intelligence Database, except for the WHO Region of the Americas and African Region, a small minority of the 58 WHO focus countries even had policies for integrating ART in maternal, newborn and child health services.

HIV testing is also being linked with child immunization services and being offered in paediatric inpatient wards, nutrition support programmes, community childcare services and other child health services, although the scale of implementation varies across and within countries *(27,28)*. A little over half (23 of 43) the countries in the WHO European Region have integrated their national congenital syphilis strategies with their maternal, newborn and child health or reproductive health strategies *(29)*. But similar integration appears to be less common in other regions. Regional initiatives for dual elimination of the mother-to-child transmission of HIV and of syphilis have been launched in the WHO Region of the Americas, African Region, South-East Asia Region and Western Pacific Region.

More can be done to take greater advantage of the benefits of integrating HIV services more effectively with routine maternal and child health services. Integrating HIV testing with routine infant immunization, for example, can help identify infants exposed to and infected with HIV and link them and their mothers to care services in a timely manner *(30)*. Although the provision of services for preventing the mother-to-child transmission of HIV has expanded and improved in many countries with a major burden of HIV, many infants continue to be exposed to HIV. Identifying and linking the infants who have acquired HIV to care remain vitally important challenges. The Global AIDS Response Progress Reporting estimates that only about one in four children living with HIV were receiving ART in 2013.

Indeed, accelerating access to HIV treatment for children is increasingly recognized as a key driver for improving broader child survival. Making the best use of this double dividend is the central theme of an action framework launched by WHO, UNICEF, the Elisabeth Glaser Pediatric AIDS Foundation and the Government of South Africa at the 17th International Conference on AIDS and STIs in Africa in late 2013 *(31)*.

8.3 HIV services are increasingly being integrated into sexual and reproductive health services

Services for HIV and for sexual and reproductive health services, including for family planning and sexually transmitted infections, are increasingly being linked or integrated. Two-thirds of 118 countries reported in 2012 that they had linked HIV to or integrated HIV into their sexual and reproductive health services *(10)*. These moves are vital for improving the health of women and their families and for achieve international development goals *(32)*.

Family planning should continue to be integrated at various HIV service delivery points. Studies have shown that women living with HIV often have high unmet need for family planning *(33,34)* and that this can have severe consequences. The risk of pregnancy-related death is eight times higher for women living with HIV than for their HIV-negative counterparts *(35)*. WHO and its partners, including major donors such as the United States President's Emergency Plan for AIDS Relief and the Global Fund, therefore are encouraging and supporting the integration of family planning with HIV programmes and services.

Some countries, including Kenya and Nigeria, have sought to nationally coordinate the work of HIV departments and reproductive health and family planning departments, and others have been assessing the status of integration and drafting action plans for strengthening these efforts *(32)*. The evidence base for the impact of strengthening links and integration is improving. A systematic review of 35 studies found generally positive outcomes for the incidence of HIV infection, incidence of sexually transmitted infections, condom use, contraceptive use, uptake of HIV testing and quality of services *(36)*. Strengthened links between sexual and reproductive health and HIV services are also improving the uptake of HIV testing and counselling. In Morocco, for example, efforts to integrate HIV into broader public health services increased the uptake of HIV counselling and testing from 46 000 people in 2010 to more than 222 000 in 2012 *(10)*.

Integration can yield many other potential benefits. Research in Kenya by the Integra Initiative (37) found that women accessing well-integrated HIV and sexual and reproductive health facilities were more likely to have used a condom the last time they had sex than were peers at less well-integrated facilities. A pilot study of integration of sexual and reproductive health and HIV services in Namibia found that a model of "one nurse, one patient, one room" can potentially improve productivity, reduce waiting times, and reduce stigma and discrimination *(38)*. Evidence indicates that both one-stop-shop and referral-based approaches can improve access to family planning services (*32*).

8.4 HIV and harm reduction services are being linked more extensively

There are many potential health benefits in linking HIV and harm reduction programmes. Needle and syringe programmes are a key harm-reduction intervention for people who inject drugs (see Chapter 7). They substantially and cost-effectively reduce HIV transmission among people who inject drugs along with reducing the transmission of other bloodborne infections, such as viral hepatitis B and C.

Needle and syringe programmes also provide an ideal platform for delivering HIV and other health services and for facilitating referrals to drug dependence treatment, including opioid substitution therapy services. Needle and syringe programmes can be tailored to meet the needs of specific populations and settings, including prisons and other closed settings *(39,40)*. Public health programmes play a key role in working with drug control programmes to advocate for introducing needle and syringe programmes for HIV prevention and as broader good public health practice.

Wider coverage of opioid substitution therapy and stronger integration of these services with HIV and TB services, as recommended in the 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection *(11)*, hold great promise. Nevertheless, the WHO HIV Country Intelligence Database shows that only 12 of the 58 focus countries had policies for providing ART in opioid substitution therapy settings in June 2014. A recent meta-analysis of studies done in North America, Europe and Asia showed that opioid substitution therapy is associated with a 54% drop in the risk of acquiring HIV among people who inject drugs and with enhanced adherence to ART *(41)*. As discussed in Chapter 7, however, global coverage of opioid substitution therapy among people who inject opioids remains very low, even though some countries have expanded access in the past three years. These kinds of programmes need to grow in number and scope, with stronger links to HIV testing, care and treatment services *(42)*.

8.5 Managing HIV infection and chronic noncommunicable diseases poses a growing challenge

The global burden of noncommunicable diseases is increasing, including in low- and middle-income countries and among people living with HIV *(43,44)*. People living with HIV face increased risks of noncommunicable diseases as a consequence of their HIV infection and side effects associated with their treatment and with ageing – such as cardiovascular disease, diabetes, liver and lung diseases and a range of non-AIDS-associated malignancies (see Chapter 7) *(43–46)*.

There are opportunities to improve the understanding of long-term metabolic complications associated with antiretroviral drug regimens in different age groups and of the comorbidities related to ageing *(47)*. In addition, closer integration of HIV and various chronic noncommunicable disease services offers many mutual benefits, such as using HIV services to screen people living with HIV for diabetes and hypertension.

Important opportunities also exist for linking clinical and operational HIV guidance more closely to existing WHO recommendations for some major coinfections and comorbidities – especially in relation to managing chronic noncommunicable diseases and HIV and the role of nutrition, integrated service delivery models and operational guidance. WHO has defined a package of essential noncommunicable disease interventions for primary health care in low-resource settings *(48)*, and it is integrating key noncommunicable disease interventions into relevant HIV guidance, such as the 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection and the HIV guidelines for key populations *(11)*.

The expansion of HIV programmes can inform the management of other chronic conditions, including noncommunicable diseases, in several respects. There are potential spillover benefits in relation to staff training and skills building, stronger staff capacity through task shifting (particularly in settings with a high burden of HIV), lessons for managing the provision of chronic care, support for strengthening adherence and retention in long-term care as well as improved longitudinal monitoring systems, procurement and distribution systems, strengthening community systems and the closer involvement of people living with HIV in delivering and evaluating services.

8.6 Linking of HIV and viral hepatitis programmes needs to be strengthened

At the end of 2013, a minority of the 58 focus countries had policies for integrating HBV and HCV testing, vaccination or treatment services with HIV treatment services (Table 8.3). Only in the WHO Region of the Americas and European Region did more than half the focus countries have policies for providing HBV and HCV testing in ART clinics. In each WHO region, about one third or fewer of the focus countries had policies calling for HBV vaccination or HCV treatment in ART clinics.

Table 8.3. WHO HIV focus countries with policies on hepatitis-specific service integration, 2013

Region	WHO Focus countries	Hepatitis C diagnosis in ART clinics		Hepatitis B and C testing in ART clinics		Hepatitis B vaccination in ART clinics		Hepatitis C treatment in ART clinics	
		n	%	*n*	%	*n*	%	*n*	%
African Region	24	5	21%	6	25%	5	21%	3	13%
Region of the Americas	10	3	30%	6	60%	3	30%	1	10%
Eastern Mediterranean Region	8	2	25%	4	50%	2	25%	1	13%
European Region	6	4	66%	4	66%	0	0%	2	33%
South-East Asia Region	5	1	20%	2	40%	1	20%	1	20%
Western Pacific Region	5	0	0%	2	40%	1	20%	0	0%
Total	58	15	26%	24	41%	12	21%	8	14%

Source: WHO HIV Country Intelligence Database, as of June 2014.

8.7 HIV continues to change the broader health landscape

The expansion and linking of HIV interventions with other health services has been contributing to a range of changes that benefit or that may inform the management of other health conditions, especially chronic conditions. These spillover effects include expanding human resource capacity through task-shifting (particularly in settings with a high burden of HIV infection), strengthened health service management to provide chronic care, innovations to link people living with HIV more reliably to care, approaches to support adherence and retention in long-term care and fortifying community systems.

HIV responses in themselves and through their links with other health areas have helped to strengthen health systems in numerous respects. In doing so, they contribute towards achieving universal health coverage, in which high-quality health services are available and people can access the services they need without suffering financial hardship (*49*). In recent years, HIV responses have contributed to:

- improving health governance and management approaches, which have become more inclusive and are more likely to involve relevant stakeholders, notably civil society and affected populations;
- strengthening programme links, in which common governing and management structures facilitate the development and implementation of more coherent health policies, improved strategic planning and the more efficient use of resources;
- improving access to high-quality medicines and commodities, for HIV and other health conditions, through prequalification, strengthened procurement and supply management systems, price-reduction measures and simplified treatment regimens and monitoring approaches;
- making health services – including primary health care, outreach services and laboratory services – more flexible and able to address a broad range of health issues;
- enabling chronic care systems that provide comprehensive and integrated management across a range of health conditions and populations *(50)*;
- expanding interventions and services that promote human rights that are relevant for all public health issues;
- ensuring that cadres of health and community workers have been trained and networked with other health and social services, enabling them to work across different health areas *(51);*
- overhauling health information systems to deliver more robust information across different health areas for improving programmes and policies;
- improving monitoring and evaluation systems and reporting, which have led to stronger accountability; and
- introducing innovations in health funding at both the international and country levels.

Chapter 9. BUILDING STRONG AND SUSTAINABLE SYSTEMS

Key Messages

The HIV response is pioneering fresh approaches and breakthroughs

Innovations are setting powerful examples for achieving universal health coverage.

- The use of task shifting and sharing and decentralization is helping stressed health care systems to expand services without comprising quality – especially ART and services for preventing the mother-to-child transmission of HIV in the WHO African Region.
- In mid-2013, 27 of 65 reporting countries, mostly in the WHO African Region, had policies that allow nurses to initiate ART for some groups of people.
- More than half the countries surveyed in the WHO African Region and 15–30% of countries in other regions now use community health workers to support ART provision.
- However, excessive reliance on volunteers and community vitality must be avoided: it cannot compensate for inadequate public-sector infrastructure and services.
- Domestic expenditure is now the single largest source of funding for ART programmes in some regions, and countries are experimenting with new funding methods.
- Nevertheless, many countries cannot fund adequate services all on their own. In 2012, 51 countries relied on international sources for more than 75% of their HIV-related spending (especially for ART programmes and services for key populations). External funding remains vitally important.
- The prequalification of diagnostics and HIV medicines is helping countries to meet international standards of quality, safety and efficacy.
- Still a concern, stock-outs have been reported in 30–35% of low- and middle-income countries since 2011.
- The prices of ARV drugs continue to decline, because of greater predictability of demand, economies of scale, increased competition among manufacturers and voluntary licensing. In 2013, generic manufacturers supplied 98% of all ARV drugs in low- and middle-income countries, at competitive prices.
- Although still high, the prices of second-line ARV regimens have also fallen significantly. Options beyond second-line therapy remain extremely costly.
- Continuing declines in ARV drug prices are not guaranteed, and patent restrictions and a weakening in generic competition may compromise affordability.

The principle that everyone should be able to access and use high-quality health services without risking financial hardship is beyond reproach. Achieving such universal health coverage means that health services must be within reasonable reach of the people who need them and that they should be available on terms and in ways that encourage and enable people to use the services when needed. In addition, the costs of using these services, including indirect and opportunity costs, should not impose undue hardship on people. The expansion and adaptation of HIV services in recent years have blazed new trails in each of these areas.

9.1 Service delivery approaches are being adapted and refined

A comprehensive HIV programme needs to deliver a broad range of interventions that cover the continuum of HIV prevention, diagnosis, care and treatment and that reach diverse populations in many different settings. A wide spectrum of services is therefore required, tailored to local contexts and target populations, and implemented through various levels of health systems and linked to other sectors.

A key component of universal health coverage is the definition of a comprehensive package of HIV services that should be made available to the community and that is funded through public programmes. WHO has developed a range of service packages for different populations and settings and for addressing specific areas of HIV. For example, WHO recommends a harm-reduction package of nine key interventions for HIV prevention, diagnosis, treatment and care among people who inject drugs *(1)*; intervention packages for other key populations, including sex workers, transgender people, prisoners and men who have sex with men *(2)*; and a package of interventions to be delivered along the continuum of HIV diagnosis, care and treatment *(3)*.

In addition, the reach, capacity and impact of HIV services can be boosted with basic adjustments and improvements – for example, by reducing the numbers of clinic visits and check-ups that are required, decentralizing services to the community level, introducing task shifting[1] and strengthening community systems. In each of these respects, the HIV response has demonstrated the far-reaching benefits of comparatively simple innovations.

9.1.1 Integrated and decentralized approaches are widening access and improving the quality of HIV services, especially for ART

Initially highly centralized and specialized, ART delivery has been shifted to a decentralized model that is more suitable for settings with a high prevalence of HIV infection and inadequately resourced health systems. A combination of burgeoning demand for ART and human resource constraints led to WHO's 2008 recommendation that a task-shifting approach be implemented *(4)*, which is further reinforced in the 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection *(3)*.

The combination of task shifting and decentralization is enabling stressed health care systems to increase service delivery points and expand their human resource capacity without compromising the quality of care. It is also saving costs and leading to simpler, quicker and improved services that are more accessible and acceptable and that are associated with an especially strong impact in the provision of ART and services for preventing mother-to-child transmission, especially in the WHO African Region *(5–7)*.

The latest available data indicate that almost 32 000 facilities were offering ART in the 134 countries reporting these data. The number of sites providing ART services increased by 6% between 2012 and 2013 in the 112 countries that reported data for both periods and by 14% in the WHO African Region. The increase in the African Region resulted mainly from extensive efforts to decentralize ART services to primary health care facilities *(8)*. Increasing numbers of people receiving ART are relying on nurses and other mid-level health workers for their HIV treatment and care *(7)*. In mid-2013, 27 of 65 reporting countries, most in the African Region, stated that they had policies that allow nurses to initiate ART for at least some groups of people *(9)*. The combination of decentralizing services and task shifting is increasingly featuring in the rapid scaling up of treatment in settings with a high burden of HIV infection.

Evidence from various settings shows that decentralized ART services improve retention on ART *(10,11)*, that the quality of care generally matches or exceeds that provided at hospital-based ART clinics and that treatment costs are lower in some cases *(7,12,13)*.

- In a large study in South Africa, 80% of the people receiving ART were retained at primary health clinics compared with 69% at the regional hospitals *(11)*.
- Shifting the provision of ART to primary health facilities has been associated with increased rates of HIV testing, use of antenatal services and ART uptake in some settings in eastern Africa *(14)*.
- Similarly, data from more than 4000 people receiving ART in Thyolo, Malawi, showed that those accessing ART at primary health facilities were less likely to be lost to follow-up than those using the local hospital *(10)*.
- A meta-analysis examining the use of task shifting in the provision of ART concluded that the approach resulted in outcomes equivalent to the care provided by physicians and may lead to decreased rates of loss to follow-up among people receiving ART *(15)*. Similarly, the model potentially reduces the costs of ART provision without compromising health outcomes *(16)*.
- In Swaziland, treatment outcomes among people with stable HIV infection managed by nurses at a primary care facility were as good as those among people who received routine hospital care *(17)*, and task shifting from physicians to nurses has also been shown to be effective in rural district hospitals in Cameroon *(18)*. Studies from Ethiopia *(19)* and South Africa *(20)* have found the approach to be feasible, effective and acceptable.

Some programmes have demonstrated positive outcomes when HIV care for children and services for preventing mother-to-child transmission have been decentralized to primary care settings with a family focus *(21,22)*. In a multicountry study in the WHO African Region, decentralization was associated with an increase in ART coverage, reduced mortality and increased retention in care among children with HIV *(23)*. Such findings informed the recommendation of the 2013 consolidated guidelines on the

[1] Countries are adopting various models of task shifting, but common to most is the extensive use of non-physician clinicians, nurses and community health workers to undertake a range of HIV clinical services formerly considered the responsibility of physicians or non-physician clinicians.

use of antiretroviral drugs for treating and preventing HIV infection *(3)* for decentralizing ART to primary health care settings *(8)*.

However, in using these approaches, care must be taken not to displace costs and obligations elsewhere in the health system or onto communities themselves. Task shifting has to be accompanied by adequate training, support and remuneration for personnel acting in new roles, and these personnel should be integrated into health care teams and mentored as their responsibilities grow.

9.1.2 Community systems can be strengthened further

As the numbers of people eligible for HIV treatment in accordance with WHO guidelines increase, the fact that decentralization and task shifting within the formal health system may not be sufficient for managing the scale of demand in countries with a high prevalence of HIV infection is becoming apparent. Community health workers are therefore increasingly important for expanding the capacity of stressed health systems to provide prevention services and care and support to large numbers of people who need lifelong care.

According to the WHO HIV Country Intelligence Database, more than half the countries surveyed in the WHO African Region and 15–30% of the countries surveyed in other regions already engage community health workers in ART support. Evidence of the effectiveness of this method is growing from the WHO African Region *(12,24)*. A recently published systematic review of 21 studies from the African Region *(25)* found that community health workers and volunteers enhanced the reach, uptake and quality of HIV services as well as the dignity, quality of life and retention in care of people living with HIV. In addition, their presence at clinics was reported to reduce waiting times, streamline patient flow and reduce the workload of health workers.

Studies also show that the use of lay health workers and peer support groups to deliver HIV services enhances coverage and access to HIV treatment and care services *(26,27)* and contributes to reducing stigma *(28)*. Dispensing antiretroviral drugs in communities, rather than only at clinics and hospitals, also appears to improve treatment adherence and seems especially effective in keeping men in treatment, according to a study done in Uganda, the United Republic of Tanzania and Zambia *(29)*.

Meanwhile, involved and empowered community-based groups remain a hallmark of successful HIV responses (*30*). Community-driven treatment literacy and support groups, buddy systems and adherence clubs to support people receiving ART *(31)*, community-assisted tracing and linking people who discontinue treatment back to care are vitally important for treatment programmes *(31,32)*. Community organizations support – and frequently also provide – HIV services for key populations *(33)*.

The 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection *(3)* therefore recommend community-supported ART delivery as a strategy to expand care for people receiving ART who are clinically stable. Evidence of the feasibility of home-based ART management *(34,35)* has opened additional opportunities to strengthen treatment adherence in the years ahead.

Countries are increasingly recognizing and formalizing these vital roles. Fully 104 of 117 reporting countries stated that they had a mechanism for promoting interaction between government, civil society and the private sector around implementing HIV programmes. Of the countries with an official recognized HIV coordinating body, 98 reported that it included civil society representatives *(30)*. Civil society representatives in 63 of 115 countries reported that their governments had closely involved people living with HIV, key populations and/or other vulnerable groups in planning and budgeting national strategic plans on HIV or their most recent activity plans *(30)*. Civil society is increasingly active in providing preventive services in all regions, such as the WHO European Region, where nongovernmental organizations are also involved in delivering harm-reduction and other outreach services for key populations, community-based rapid HIV testing and linkage to HIV care.

Tapping into community systems, however, carries risks and responsibilities. Excessive reliance on volunteers and community vitality cannot compensate for inadequate public sector infrastructure and services. The quality and continuity of health services delivered by community health workers, for example, is likely to suffer without sufficient investment in supportive systems and organizational policies, adequate supervision and mentorship, high-quality training and programme resources *(36–38)*. This was confirmed in a recent situational analysis from Malawi, where community health workers also noted that increasing workloads from task shifting created difficulty in completing their primary duties *(39)*.

Building effective and sustainable community systems requires investing sufficiently in human and financial resources and strengthening partnerships between community members and the public sector. It also requires strengthening links between community systems and health systems, for example by formalizing partnerships, creating two-way referral mechanisms and co-locating community health workers at health facilities. This would help to streamline access to HIV services, enable the sharing of knowledge and facilitate task shifting.

9.2 A solid evidence base is being achieved

Effective and equitable HIV responses require a strong, up-to-date evidence base. This includes regularly monitoring epidemic dynamics, the factors influencing epidemics and the performances of HIV responses. Routine health information systems need to track service coverage and quality and analyse data to ensure that lessons are quickly factored into operations. In addition, a broad research agenda is required. It should range across basic, clinical and implementation science to ensure that the HIV response continues to be driven by innovation and that evidence is generated and synthesized to improve the efficacy and cost-effectiveness of interventions. These strategic information needs are becoming more complex as HIV programmes mature. Diverse innovations have been introduced and they are benefiting both HIV responses and health systems overall.

Understanding of the sources and rates of new HIV infections has improved considerably in the past three years. Dozens of countries have used modes of transmission methods to identify the main pathways of HIV transmission and guide their HIV strategies *(40)*. More countries are collecting data and analysing their epidemics in ways that enable them to identify changing risk practices, where HIV is clustering, where localized epidemics may be emerging, where specific populations at higher risk of infection are located, where vital HIV services are deficient or absent and what factors are blocking access to or uptake of those services.

Estimations of the size of key populations and epidemic modelling are more widespread and accurate, and data are increasingly disaggregated by sex, age and population – improvements that are essential for guiding HIV investment. Results from modes of transmission studies in the WHO Eastern Mediterranean Region, for example, have underlined the need for HIV efforts to focus especially on commercial sex networks; in the eastern parts of the WHO European Region, the studies have confirmed the need for enhancing prevention, treatment and care services for people who inject drugs. In Latin America, preventing high-risk sexual behaviour among men who have sex with men has been identified as a priority. The studies in Asia have revealed wide variation in how key populations contribute to HIV transmission, including within countries, highlighting a need for careful local assessment to guide HIV responses there *(40)*. Studies have identified explosive epidemics of HIV among men who have sex with men in several urban centres, including Bangkok *(41)* and Manila *(42)*, which call into question the effectiveness of the prevention policies and programmes that have been implemented in those settings.

Collecting more information on key populations can carry risks with regard to confidentiality, however, particularly if law enforcement authorities and others use the data to locate, arrest and/or harass certain populations, including health care workers who are providing outreach services to these populations. It is therefore vital that the ethical principles of public health surveillance be heeded to avoid possible harm to these populations.

Meanwhile, the introduction of new indicators has made the monitoring and evaluation of programme performance and impact more nuanced. More detailed and reliable information is being collected on cost-effectiveness and cost-efficiency, pricing and procurement of HIV-related commodities and monitoring of drug resistance and toxicity.

Many of these advances stem from important new data sets that are being gathered routinely, including the Global AIDS Response Progress Reporting system (which is updated annually) and national mid-term reviews. In 2014, 180 countries submitted Global AIDS Response Progress Reporting reports on progress towards core HIV indicators; the target is to have 192 countries reporting. By the end of 2013, 109 countries had conducted mid-term reviews of their national progress towards the 2015 HIV targets, and 100 of these had conducted formal stocktaking exercises and 101 had also held national stakeholder consultations *(43)*.

Among the more recent innovations is the Service Availability and Readiness Assessment, a health facility tool that is designed to assess and monitor service availability and to assess to what extent services are equipped and ready to provide the interventions that they are supposed to deliver – including services for HIV. The Service Availability and Readiness Assessment can be used to guide the improvement of individual health facilities and to accredit them to provide certain services. When the Service Availability and Readiness Assessment is used in a representative sample of health facilities, it also offers solid data to inform national planning and direct investment in the health sector.

Countries have increased their use of national surveys such as the Demographic Health Surveys, AIDS Indicators Surveys and other population-based surveys. By the end of 2013, about 50 countries had conducted such surveys, many more than once. The use of recently developed technologies enables these surveys to include testing to ascertain HIV incidence, viral load and levels of drug resistance. Meanwhile, WHO continues to play a leading role in reporting on the global and regional HIV responses. WHO also maintains key global databases, such as the Global Health Observatory, the WHO HIV Country Intelligence Database and the Global Price Reporting Mechanism for HIV-related medicines and diagnostics.

Expanding and improving HIV programmes have contributed to increasing the harmonization of various information systems. For example, data generated through routine antenatal services and services to prevent mother-to-child transmission and recorded in programme records, such as client registers, now also support antenatal surveillance. In the past, antenatal surveillance relied heavily on serosurveys that were based on unlinked, anonymous testing. Most of the demographic and HIV testing variables historically gathered in those unlinked, anonymous testing surveys are now available in routine records in most countries. This is enabling

many countries, especially in the WHO African Region, to assess the quality of programmes to prevent mother-to-child transmission and to replace or supplement the HIV surveillance methods used previously. Using routine data on preventing mother-to-child transmission in these ways is also reducing the costs and promoting the long-term sustainability of HIV-related surveillance efforts. Similar integration of information systems is occurring in relation to ART programmes in several countries in the WHO Region of the Americas, South-East Asia Region and Western Pacific Region, and improvements are underway in the African Region.

Despite extraordinary progress in the HIV response, implementation still needs to be accelerated. Efficiency, effectiveness and quality need to improve, costs need to be reduced and underserved populations need to be reached to achieve the 2015 Millennium Development Goals and universal access targets. There are many opportunities to improve service delivery and achieve greater impact without necessarily increasing resources. Implementation science aims to identify and guide such improvements.

WHO is supporting efforts to articulate a global implementation science agenda. The HIV prevention, treatment and care cascade (see Chapter 5) provides a useful framework for identifying specific areas for research, including increasing adherence and retention in care and improving the integrity of the treatment cascade. Examples of ongoing implementation research include studies that consider service delivery models for pre-exposure prophylaxis of HIV and early initiation of ART for key populations *(44)*.

9.3 Funding of health systems is evolving

HIV responses have continued to lead the way in devising ways to protect people against the financial risks associated with seeking health care. Many HIV services are provided free of charge, and countries increasingly also use supportive arrangements (such as decentralizing services or offering transport vouchers) to minimize the indirect costs for people using services. Direct, out-of-pocket payments (including in situations where health care is supposedly free of user charges) are now widely recognized as a major threat to the well-being of low-income households requiring health care *(45)*.[2] These payments are declining and being replaced with various pooling and prepayment arrangements and with conditional cash transfer and voucher systems *(47)*.

These trends are part of a wider shift in an increasing number of countries towards structuring domestic spending on health in ways that can enable everybody to use the full range of health services they need. Experience shows that the best way to achieve this is with compulsory prepayment of some type – for example taxes and other government charges and social insurance premiums – that are subsequently pooled to spread risks. Contributions should reflect people's ability to pay, which means that there will always need to be subsidies for poor and vulnerable people.

9.3.1 Domestic HIV funding has increased …

Within that context, domestic expenditure on HIV programmes in low- and middle-income countries has increased considerably in recent years. The latest available data show that domestic sources accounted for about 53% of funding for HIV in low- and middle-income countries in 2012, totalling an estimated US$ 9.9 billion [US$ 7.7 billion–12.2 billion] *(43)*. In several regions, domestic expenditure now constitutes the single largest source of funding for HIV treatment programmes.

Among the 43 low- and middle-income countries reporting HIV spending data in 2012, more than two thirds reported an increase in domestic spending. In several countries – including Chad, Guinea, Kyrgyzstan and Sierra Leone – domestic funding for HIV activities more than doubled, and there have also been sharp increases in Kenya, South Africa, Togo and Zambia in recent years *(43)*. In the WHO European Region, at least three countries (Estonia, Kazakhstan and the Russian Federation) have assumed full responsibility for funding their ART programmes after their Global Fund grants ended.

Based on the absolute amount of funding, the upward trend has been strongest among upper-middle-income countries, which generally also fund a larger proportion of health services from domestic resources. Nevertheless, as a proportion of countries' overall HIV funding, the largest increases in domestic funding in 2012 were in low-income countries (up by 29% compared with 2011), followed by lower-middle-income countries (26%) and upper-middle-income countries (6%) *(43)*.

A growing number of countries are pursuing additional funding methods specifically for their HIV programmes, including dedicated tax levies (such as Zimbabwe's AIDS levy, which enabled an estimated 70 000 people to be added to the country's ART programme in 2012), and the levies imposed on mobile phone use in Rwanda and Uganda *(48)* and HIV trust funds *(43,49)*. Savings, such as those achieved by reforming South Africa and Swaziland's tender processes in the past three years, have also freed up funding to expand treatment coverage further *(50)*.

[2] An estimated 150 million people suffer financial catastrophe and 100 million are pushed under the poverty line each year because of out-of-pocket spending on health *(46)*.

Overall, an estimated US$ 18.9 billion [US$ 16.6 billion–21.2 billion] was available in 2012 for HIV programmes in low- and middle-income countries – up by about 10% from 2011 *(51)*, due mainly to increased domestic funding of HIV responses.

9.3.2 … but external support remains crucial for many countries

Despite the increases in domestic funding, in many lower-middle-income and low-income countries the amounts raised are still not sufficient to fund services of adequate quantity and quality for all who need them. In 2012, 51 countries relied on international sources for more than 75% of HIV-related spending. ART programmes in many low- and middle-income countries rely heavily on international funding support *(43)*, as do HIV programmes focusing on key populations *(43)*.

Middle-income countries face specific challenges. As their domestic economic output rises, countries may no longer be eligible for funding from many international development agencies and donors. Furthermore, they may encounter difficulties in negotiating affordable prices for HIV medicines, diagnostics and other commodities if they are then regarded solely as commercial markets rather than recipients of development assistance. However, since middle-income countries are home to most of the world's poor, an estimated 960 million people, these shifts are contributing to major health and social inequities, including access to HIV services *(52)*.

International spending on HIV programmes rose slightly in 2012, returning it to the peak level achieved in 2009 *(43)*. The United States President's Emergency Plan for AIDS Relief, a bilateral aid programme, provided almost half (49%) of international HIV assistance, while a further 28% was channelled through multilateral institutions, such as the Global Fund to Fight AIDS, Tuberculosis and Malaria, the global health organization UNITAID, and United Nations agencies *(43)*.

Some of these funders have introduced innovative funding and purchasing approaches. For example, 65% of the US$ 1.9 billion mobilized by UNITAID up to the end of 2012 was raised through a levy on airline tickets in several countries. Meanwhile, UNITAID's large purchasing power enables it to negotiate lower prices for quality-assured HIV medicines and diagnostics, which influences market dynamics in ways that benefit a wide range of countries in addition to those receiving direct UNITAID support.

The importance of external funding stands undiminished. Improving sustainability also requires external funding to become more predictable, harmonized and aligned with country priorities. Multi-year funding would enable countries to plan ahead with greater predictability. Emerging market economies, along with new private philanthropy, provide opportunities for expanding the donor base.

Moreover, for donor funding to help countries move towards universal health coverage, it should meet the criteria of effectiveness, efficiency and equity – which is more likely when donor aid is used to augment domestic pooled resources (for example, in providing budget support) rather than funding fragmented projects. Health inequities need to be addressed, with development assistance reoriented to benefit poor people and communities wherever they are, while giving priority to low-income countries and ensuring that poor people in middle-income countries also benefit *(52)*.

9.3.3 … and the scope for additional cost savings may be narrowing in many countries

In all regions, falling drug prices have been a major factor in reducing the costs of HIV treatment per person (see section 9.5), but savings have been achieved in many other respects, as well.

Economies of scale and greater competition between drug manufacturers have reduced the prices of antiretroviral medicines, while adjustments to tender specifications and reductions in transport and logistical expenses, as well as lower tariffs and duties, have contributed to the savings. In addition, in settings with a high burden of HIV infection, decentralizing services and task shifting has led to cost savings while extending the reach and improving the quality of many HIV services. The costs associated with providing ART to nurse-managed people living with HIV at decentralized facilities in a South Africa study, for example, were 11% lower than for doctor-managed people in hospitals *(6)*.

However, given that spare capacity is now very limited in most HIV programmes in countries with a high HIV prevalence, further cost reductions will require ongoing innovation. There are also doubts about the scope for additional, substantial cost savings at the facility level *(4,53,54)*, although some savings might be achieved by using community-based models for providing and managing HIV treatment (bearing in mind the cautions noted earlier).

9.4 Human resources for health need to be bolstered

The recruitment and training of adequate numbers of health workers remain the mainstay of an effective health system. However, funding constraints, staff attrition caused by difficult working conditions and an exodus of public health workers into the private sector and to high-income countries continue to weaken health systems in many low- and middle-income countries.

Countries are trying to compensate by expanding their use of task shifting, deploying community health workers and relying more heavily on community networks and systems, as discussed earlier. However, the fundamental duty of ensuring universal health coverage depends on government leadership.

Comprehensive, long-term human resource planning for health services – both public and private – is a prerequisite for fulfilling that duty, as are quality-assurance measures, capacity-building and arrangements for integrating community-based support more solidly into the formal health system. The supply and quality of health workers in public health systems should be improved, and new forms of regional collaboration and coordination in the training and distribution of health workers need to be devised.

The human resource crisis is not limited to the HIV response. Worldwide, there is an estimated shortage of about 2.4 million doctors, nurses and midwives, and shortages in trained health workforce have been identified as a major barrier to achieving the 2015 HIV targets. Thus, the United States President's Emergency Plan for AIDS Relief intends to support the training of 140 000 health care workers. Given these challenges, WHO has joined with the United States President's Emergency Plan for AIDS Relief to support the transformative scaling up of health professional education *(56)* through the Nursing Education Partnership Initiative and the Medical Education Partnership Initiative. These initiatives, which focus on health education systems in Africa, aim to expand clinical and research capacity and to support innovative retention strategies for doctors, nurses, midwives and teaching staff.

Meanwhile, the almost 60 million global health workers are very unevenly and inequitably distributed, with the lowest coverage typically in the countries with the lowest income, which tend to have the greatest needs. However, high-income countries also have great demand, which contributes to the migration of health personnel, especially doctors and nurses, from low- and middle-income countries to high-income countries in Europe, North America, Australasia and the Middle East. This runs the risk of weakening the capacity of health systems in the countries supplying the health workers.

Box 9.1. Protecting health care workers from HIV infection and TB

Ensuring access to services for preventing, diagnosing and treating HIV and TB should be a core component of human resource planning, particularly in high-prevalence settings. The International Labour Organization, UNAIDS and WHO have jointly developed 14-point policy guidelines for improving health workers' access to such services *(55)*. The guidelines cover workers' rights, national legislation and social protection of health workers and provide a framework for workplace policies, programmes and training while addressing budgeting, monitoring and evaluation. Putting the guidelines into effective practice requires advocacy in the health and labour sectors as well as firm recognition of the important roles of health workers.

In an effort to redress such imbalances in the distribution of health care workers globally and to minimize the negative effects of health worker migration, the World Health Assembly endorsed the WHO Global Code of Practice on the International Recruitment of Health Personnel in 2010 *(57)*. The Code identifies ethical norms, as well as institutional and legal arrangements, to guide international collaboration on health worker migration. By 2014, at least 37 countries have taken steps to implement the Code, while 56 countries, mostly destination countries in Europe, have undertaken an assessment based on a WHO self-assessment tool *(58)*.

9.5 The supply of medicines and diagnostics is becoming more affordable and reliable

A comprehensive approach is the most effective way to ensure equitable, reliable and affordable access to HIV medicines and diagnostics. In addition to reducing the prices of commodities, countries are seeking savings by boosting efficiency in service delivery and reducing waste, and they are devising methods to achieve reliable and sustainable supplies of health commodities.

9.5.1 The quality of medicines is being vetted more thoroughly

Every year, countries spend hundreds of millions of US dollars purchasing HIV diagnostics and medicines through international funding and/or procurement mechanisms. Standardizing and regulating the quality of these products

is critically important to avoid waste and inefficiency and to ensure safe and effective use *(59)*.

By prequalifying diagnostics and HIV medicines, WHO helps to ensure that countries and procurement agencies can procure medicines and diagnostics that meet international standards of quality, safety and efficacy *(60)*. Antiretroviral drugs and other HIV-related medicines outlined in WHO guidelines are included on the WHO List of Essential Medicines, which informs countries' own national lists for procurement. By the end of 2013, WHO had prequalified 23 HIV diagnostics and one adult male circumcision device, 234 medicinal products for treating HIV-related conditions and 12 active pharmaceutical ingredients for use in manufacturing related pharmaceutical products. The prequalification of suppliers has also helped put procurement on a more solid footing.

Shared regional regulatory authorities for medicines can speed up the approval and availability of quality life-saving medicines and boost quality assurance and pharmacovigilance. They are also important for preventing the use of counterfeit or substandard medicines. In eastern Africa, for example, the Medicines Registration Harmonization Project is aimed at strengthening regulatory capacities for medicines, and thereby improving the reliability and quality of antiretroviral drugs and other medicines in the region.[3]

9.5.2 Supply chains are being strengthened

More accurate planning and more reliable supply chains are vital. Drug stock-outs are a recurring problem that discourages treatment uptake, weakens adherence and sabotages programme effectiveness. They are also an early warning signal for the possible development of HIV drug resistance. Still a concern, the proportion of low- and middle-income countries reporting stock-outs in the Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS) has ranged between 30% and 35% since 2011, with 38 of 108 countries reporting that they experienced stock-outs in 2013.

Several ways of avoiding or overcoming stock-outs have proved successful in recent years, including temporarily switching to a different ART regimen, transferring drugs from other health facilities or regions and purchasing emergency supplies from regional stores in neighbouring countries *(8)*.

In 2012, supported by the Clinton Health Access Initiative, UNITAID provided funds for children's and second-line antiretroviral medicines to 21 countries in 2012, while the HIV/AIDS Emergency Commodity Fund of the United States President's Emergency Plan for AIDS Relief supported four countries in averting stock-outs of antiretroviral and opportunistic infection medicines by funding the supply of antiretroviral drugs, test kits and opportunistic infection drugs *(8)*.

Forecasting treatment needs and demand for HIV medicines enables countries to develop reliable procurement plans to avoid stock-outs and waste and for manufacturers to plan their production capacity and distribution. Countries can also ease disruptions by ensuring they have sufficient buffer stocks (managed nationally or even regionally) *(8)*.

Stronger local manufacturing capacity in regions with high demand for antiretroviral drugs would also strengthen supply chains. Aside from South Africa, substantial pharmaceutical manufacturing capacity has been absent in most of the WHO African Region. However, recent years have seen increased efforts to expand local production of essential drugs – including antiretroviral drugs – and harmonize the regulatory arrangements for medicines in Africa *(61)*. Kenya, South Africa, Uganda and Zimbabwe are producing WHO prequalified antiretroviral drugs, while Mozambique and the United Republic of Tanzania are expected to follow their example. In addition, Botswana, Ethiopia, Lesotho, Madagascar, Namibia and Zambia have some pharmaceutical manufacturing capacity, although it not yet used for producing antiretroviral drugs *(48)*.

9.5.3 The cost of HIV treatment continues to decrease

The prices of antiretroviral drugs has continued to decline in the past three years, because of greater predictability of demand, economies of scale (as ART programmes are scaled up) and increased competition among manufacturers. In 2013, generic manufacturers supplied 98% of all antiretroviral drugs in low- and middle-income countries, at competitive prices. There has been significant progress in relation to voluntary licensing, partly facilitated through the Medicines Patent Pool (although some middle-income countries outside the WHO African Region are not benefitting from those arrangements). Buttressing the advances is the WHO Global Price Reporting Mechanism and the Regulatory Status Database, which provide key information on the manufacturers and prices of HIV medicines, thus facilitating price negotiations and sustainable supplies.

In low- and middle-income countries, the median price of first-line ART regimens containing TDF decreased to US$ 115 per person per year *(62)*. Prices have continued to decline despite the wider adoption of more expensive TDF-based regimens. Fig. 9.1 shows the median price per person-year of the WHO-preferred first-line regimens.

[3] Launched in 2011, the project is a high-level alliance of partners that include UNAIDS, WHO, the Bill & Melinda Gates Foundation, the World Bank, the Clinton Health Access Initiative and the United Kingdom Department for International Development.

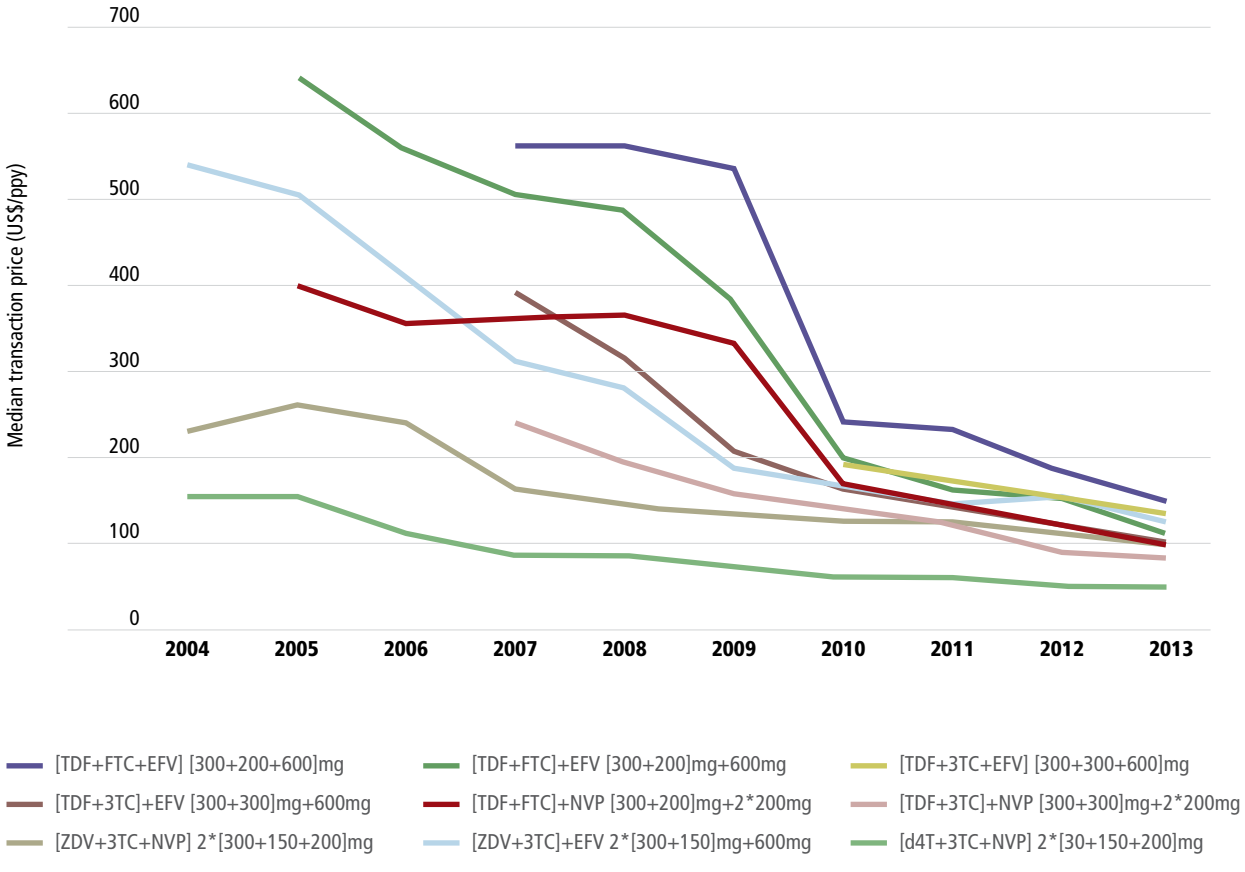
However, some middle-income countries pay much higher prices. These tend to be countries with patents or data exclusivity provisions that limit the use of generic products. Belarus, for example, purchased the first-line regimen TDF + FTC + EFV in 2013 at US$ 1221 per person per year, while the generic version of the same product cost a median of US$ 148 per person per year across middle-income countries.

Although still high, the prices of second-line regimens also declined substantially between 2010 and 2013, with most low- and middle-income countries able to access second-line treatment at about US$ 330 per person per year. This development stems largely from the increasing availability of generic formulations. Some countries, however, pay considerably higher prices. In 2011 and 2012, Brazil, China, Indonesia, Kazakhstan, the Russian Federation and Ukraine paid prices for second-line regimens that were 2–11 times higher than those paid in other middle-income countries. The main cost driver was lopinavir/ritonavir (LPV/r), which had to be sourced from the originator company because of patent restrictions. In addition, some middle-income countries prefer to use domestically produced medicines, even if they are more expensive than generic imports. In Brazil and China, for example, the use of domestically produced generic AZT and 3TC resulted in higher prices than those available from internationally competitive generic suppliers.

Options beyond second-line treatment remain extremely costly. There are no WHO-prequalified generic versions of raltegravir (RAL), etravirine (ETR) or darunavir (DRV) currently, and the prices remain high. The median prices of these drugs (300-mg formulation only for DRV) have decreased in the past few years in countries participating in the access programmes of originator companies. In these countries, the lowest prices per person per year recorded in the Global Price Reporting Mechanism in 2013 were US$ 663 (for DRV), US$ 328 (ETR) and US$ 510 (RAL). Thus, combining DRV, ETR and RAL in a third-line regimen cost almost 15 times more than a first-line regimen.

Middle-income countries outside the WHO African Region that are not included in these access programmes pay much higher prices. Thus, data for 2013 from the Global Price Reporting Mechanism show ETR priced at US$ 2272 per year in Morocco in 2012, while DRV (600 mg) cost between US$ 4486 in Cuba and US$ 7501 in the Republic of Moldova, while RAL was priced at US$ 3589 in Belarus in 2012 *(62)*.

Fig. 9.1. Median prices of WHO-preferred first-line regimens per patient year, in US$, in low- and middle-income countries, 2004–2013



Source: Data from the WHO Global Price Reporting Mechanism.

Continuing declines in antiretroviral drug prices are not a foregone conclusion. Although patent protection is not the only reason for high antiretroviral drug prices, it is an important factor and will remain so, especially because new, largely patent-protected drugs will be needed for first- and second-line regimens to treat HIV infection effectively in the years ahead.

Greater efforts are needed to manage the patents on antiretroviral drug in ways that facilitate more affordable pricing. Significant progress has been made in relation to voluntary licensing, partly mediated through the Medicines Patent Pool. This is evident in the large volumes of antiretroviral drugs generic producers have been supplying to low- and middle-income countries. But these concessions are not available everywhere: middle-income countries outside the WHO African Region typically are deemed to lie beyond the geographical range of pharmaceutical companies' voluntary licenses.

In addition, there are concerns that patent restrictions and a weakening in generic competition might compromise the affordability of ART, especially for new, promising medicines on the market or in the pipeline. Avoiding such outcomes will require continued commitment by all – including the producers – and vigilance from countries and communities. Countries need to ensure that patents are awarded only for genuine innovations and should avoid provisions in bilateral and multilateral free-trade agreements that may disrupt the future availability of affordable medicines (Boxes 9.2 and 9.3) *(63)*.

Box 9.2. Achieving wider access to new treatment regimens

While high antiretroviral drug prices are hindering the wider provision of second- and third-line regimens, lack of access to reliable diagnosis of treatment failure is another major barrier. As viral load testing becomes more widely available, uptake of second- and third-line treatments also tends to increase. Although information on the prices of viral load tests is scarce, they also appear to be decreasing: as part of an arrangement made with suppliers in Kenya and Uganda, a price of US$ 10.50 was agreed to for these countries (personal communications, Ministry of Health, Kenya and Ministry of Health, Uganda).

Further, the difficulty many countries experience in decentralizing the initiation of second-line treatment to lower-level health level facilities that provide first-line treatment is hindering wider access to second- and third-line regimens. When frontline service providers are capable of initiating second-line treatment, such as in Brazil, uptake also tends to increase.

Box 9.3. Putting diagnostics to use in frontline facilities

Current WHO guidelines do not insist on a CD4 test before initiating ART, but for clinical reasons it is considered useful at the start of treatment. Access to CD4 testing, however, remains limited *(8)*. According to the WHO 2012 diagnostics survey (*60*), fewer than 3800 CD4 count machines were operating in 69 low- and middle-income countries in 2011. User charges for laboratory tests, out-of-service machines and a lack of reagents can severely limit access to CD4 tests, even in settings with machines. These kinds of operational obstacles highlight the need for national strategic plans for purchasing and deploying laboratory technologies *(8)*.

An encouraging development is the increasing use of point-of-care CD4 testing technology, which can speed up the assessment of eligibility for ART in accordance with WHO guidelines and reduce losses to care before ART is started. A recent systematic review of 15 studies from the WHO African Region *(64)* suggests that point-of-care CD4 testing can speed up the assessment of eligibility for ART and increase retention in care before starting treatment, although there was mixed evidence regarding increases in treatment initiation.

Chapter 10. PROMOTING GENDER EQUALITY AND REMOVING HARMFUL GENDER NORMS

Key Messages

Gender inequalities and gender violence remain major challenges

Gender inequalities continue to underpin the disproportionately high incidence of HIV infection among women and girls in generalized HIV epidemics.

- In eastern and southern Africa, young women in most countries are approximately twice as likely to acquire HIV compared to their male counterparts.
- Gender-based violence remains a problem of epidemic proportions and is a great risk factor for HIV infection. Women who experience intimate partner violence are about 1.5 times more likely to be living with HIV than women who are spared such violence.
- Women from key populations are especially likely to experience violence and abuse, with criminalization and law enforcement activities among the risk factors for this violence.
- Commitments to strengthen gender equality are seldom being translated into systemic improvements.
- Studies show that empowering women economically can cut their risk of acquiring HIV infection and that school-based sex education is an effective strategy for reducing HIV-related risk among girls.
- Greater investment is needed in female-controlled prevention technologies, including microbicides, pre- and post-exposure prophylaxis and female condoms.

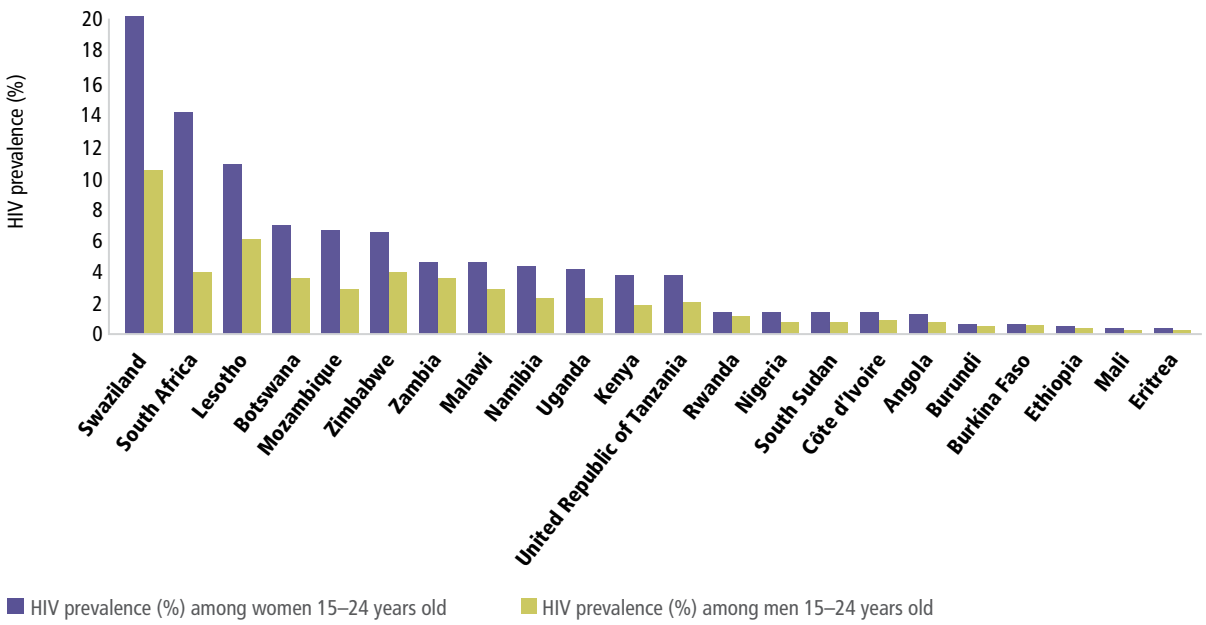
The success of HIV programmes is decided not only by political commitment and funding for their technical components but also by the legal, social and economic environments in which they operate. Stigma and discrimination still confound efforts in many places – as do the many laws and practices that hinder or deny key populations and people living with HIV adequate access to potentially life-saving services. Gender inequalities, including harmful gender norms, also continue to hinder more effective HIV responses.

In addition to the greater physiological susceptibility of women and girls to HIV infection, gender inequalities are major factors underlying the disproportionately high incidence of HIV infection among women and girls in settings with generalized HIV epidemics.

Gender inequalities contribute to the risk of transmitting HIV in several ways. Power imbalances between men and women can make women economically dependent on male partners, expose them to violence, including sexual violence, and deny them control over their sexual and reproductive decisions *(1)*. Women's vulnerability to HIV is most pronounced in the WHO African Region – and especially among young women (15–24 years old): UNAIDS/WHO estimate that 2.2% of young women were living with HIV in 2013 compared with 1.1% of young men. The vulnerability of young women to HIV is particularly severe in eastern and southern Africa, where UNAIDS/WHO estimate that young women in most countries are approximately twice as likely to acquire HIV infection as young men (Fig. 10.1).

Many women continue to be severely limited in their ability to protect themselves against HIV infection. A qualitative assessment carried out in five countries with large populations of people living with HIV (the Democratic Republic of the Congo, Ethiopia, India, Nigeria and Uganda) showed that comprehensive HIV knowledge among women lagged behind that among men and that cultural perceptions and beliefs about HIV and gender roles continued to deter women's access to services. Unequal gender relations and women's socioeconomic dependence on men also diminish their power to make decisions regarding using HIV and maternal health services (Box 10.1) *(2)*.

Figure 10.1. Prevalence of HIV infection (%) among women and men 15–24 years old in selected countries in the African Region, 2012



Source: UNAIDS/WHO estimates.

Discrimination based on sexual orientation and gender identity also generate inequalities that disadvantage men who have sex with men and transgender people and that intersect with inequalities based on gender. Very few information systems currently disaggregate data to include transgender people (transgender women and transgender men). However, qualitative research shows that transgender women encounter serious difficulties in accessing HIV-related services, frequently encounter ridicule and neglect from health service providers and experience confusion over where they should access services that are structured for men or women *(14–16)*.

Box 10.1. Harmful norms of masculinity

Prevailing norms of masculinity also increase men's vulnerability to HIV, encouraging high-risk sexual behaviour and deterring them from seeking timely health care (see Chapter 5) *(3,4)*. In the WHO African Region, men who are eligible for ART are generally less likely to receive it than women who are eligible for ART. HIV testing rates in the African Region are also consistently lower for men than women, and men tend to access treatment with more advanced disease and show poorer adherence to treatment *(5)*. As a result, HIV-related mortality rates among people receiving ART are higher among men than among women in some countries, including Malawi, South Africa, Uganda and the United Republic of Tanzania *(6–9)*.

Integrating HIV services with antenatal care has improved women's access to HIV testing, treatment and care services. However, it is not clear whether the expansion of antenatal testing and programmes for preventing mother-to-child transmission accounts for the disparities in the uptake of ART between men and women. A recent study of 98 000 people in KwaZulu-Natal province in South Africa *(10)* found that, regardless of pregnancy, women were about 2.4 times more likely than men to be receiving ART. Studies suggest that men's concern about being perceived as less "manly" is one reason why they may not seek timely HIV testing and counselling, treatment and care services. The opportunity costs of visiting treatment facilities may also discourage men from starting or continuing on ART *(11)*. Although social factors appear to underpin such gender differences in the use of HIV services, health services can be made more accessible by having more clinics with male personnel and by integrating HIV services in ways that encourage earlier and easier use by men: for example, where men are more likely to seek services such as through workplace programmes *(12,13)*.

10.1 Stronger action against gender-based violence should be made a priority …

Gender-based violence is a global phenomenon that disproportionately affects women and girls. Much of this violence is intimate partner violence: it is estimated that nearly 30% of women globally experience physical and/or sexual violence by their intimate partner at least once in their lifetime, making gender-based violence a problem of epidemic proportions *(17)*. Social norms in many countries endorse male privilege and entitlement and female subordination. Such norms strongly predict rates of violence against women *(18)*: a population-based study in Botswana and Swaziland found that men who adhere to these norms were twice as likely to dominate sexual decision-making and sexually assault their partners *(19)*.

In addition to violating women's human rights, violence against women is associated with an increased risk of HIV infection. A systematic review of 41 studies from different settings (including two longitudinal studies from South Africa and Uganda) has shown that women who experience intimate partner violence are on average 1.5 times more likely to be infected with HIV than women who are spared such violence *(17)*.

Studies show that several pathways explain the association between violence against women and increased risk of HIV infection *(20)*. First, gender inequality, including harmful gender norms, is a common driver of both violence against women and HIV. Second, women's victimization and men's perpetration of violence are associated with a clustering of risk behaviour such as having multiple sexual partners, transactional sex, substance use and infrequent condom use *(21–23)*. Third, sexual violence can directly increase the risk of transmitting HIV *(24)*. Fourth, when women test for HIV and disclose their status, they may be at increased risk of sexual, physical and mental violence *(25)*.

In addition, women living with HIV frequently cite violence or the fear of violence as a significant barrier to accessing life-saving HIV prevention and treatment services *(26)*. Violence against women is also associated with poorer clinical outcomes for people receiving ART *(27)*.

Women from key populations, such as drug users, sex workers and transgender women, are especially likely to experience violence and abuse, with criminalization and law enforcement activities among the risk factors for this violence *(17,27–30)*. A recent systematic review of the prevalence and correlates of violence among sex workers *(31)* shows high levels of violence against sex workers.[1]

These realities are rhetorically recognized, but effective responses to gender-based violence are rare, and few countries have national HIV strategic plans that comprehensively address gender-based violence, including countries with very high burdens of HIV in eastern and southern Africa *(32)*. At a minimum, health services, including psychosocial support and legal recourse for people who have experienced gender-based violence, should be made more widely available. WHO guidelines recommend that health services (including HIV services) identify women who are at risk of intimate partner violence and provide appropriate clinical and mental health care. WHO guidelines also recommend providing comprehensive post-rape care that includes post-exposure prophylaxis for sexually transmitted infections and HIV and emergency contraception to women who have been sexually assaulted *(33)*. WHO is supporting countries in developing or aligning their national policies and protocols with these recommendations.

Various approaches for preventing and reducing violence against women, especially intimate partner violence, have shown promise. They include school-based programmes to prevent violence within dating relationships; strategies that combine microfinance with gender equality training; promoting conflict-resolution skills in communities; and policies to reduce the harmful use of alcohol. Interventions to promote equitable gender norms by working with men and boys, and through community mobilization, have the potential to reduce violence against women and to improve HIV-related outcomes. Community empowerment interventions with sex workers are also being implemented and have been shown to be effective in reducing vulnerability to HIV infection *(20)*.

10.2 … and much more can be done to boost gender equality

At a minimum, health services need to be provided in a gender-sensitive, confidential and non-judgemental manner and need to reflect the respective concerns and realities of women, men and transgender people. The provision of comprehensive sexuality education in and out of school needs to improve, and much wider access is needed to youth-friendly services that empower young women to protect themselves. Strong evidence indicates

[1] Lifetime prevalence of any or combined workplace violence ranged from 45% to 75%, and over the previous year it ranged from 32% to 55%.

that school-based sex education is an effective strategy for reducing HIV-related risk, as shown in a recent systematic review of 64 studies from six continents *(34)*. Students who received school-based sex education interventions had significantly stronger HIV knowledge and higher levels of condom use and were more likely to delay their sexual debut compared with students who lacked such education *(34)*.

Investing in research into female-controlled prevention technologies is also essential. These include microbicides, pre- and post-exposure prophylaxis and female condoms and working with networks of women living with HIV and women's organizations to ensure that women and girls have access to these technologies *(26)*. The female condom is the only woman-initiated HIV prevention tool currently available that is both an effective contraceptive and capable of reducing the risk of transmitting and acquiring sexually transmitted infections. Although female condoms have been introduced in many countries, they tend to be much more expensive than male condoms and are poorly marketed (see Chapter 2).

There are many opportunities for engaging men and promoting gender-equitable norms and behaviour more intensively in the HIV response. For example, voluntary medical male circumcision programmes provide an opportunity to address broader HIV prevention and care issues and to promote gender-equitable norms and strategies for reducing gender-based violence. Prisons and congregate settings for men, such as mining communities, pose particular challenges for preventing and managing sexual risk behaviour and violence.

Political commitment to reduce gender inequality – especially in relation to HIV epidemics – is growing in most regions. Most countries recognize, at least formally, that effective HIV responses require greater attention to gender equality. Nearly all countries (92%) that conducted mid-term reviews of their national HIV responses in 2012 acknowledged the central importance of addressing gender inequalities. Sex-disaggregated data collection is increasing, and upcoming WHO guidance on strategic information will provide guidance for national programmes on how to appropriately disaggregate, analyse and report such data. Countries in the WHO African Region that have a high prevalence of HIV have some of the strongest efforts to promote gender equality in the access and use of HIV services. The participation of women's groups and networks in HIV programmes is being encouraged *(35)*, and efforts to engage men in promoting gender equality are increasing – but these are mostly small in scale.

Nevertheless, the leadership, investment and strategies needed to increase the capacity of women and girls to protect them from HIV infection and to engage men in promoting gender equality as part of the HIV response need to be bolstered. The mid-term reviews of national HIV responses in 2012 indicated that less than half the reporting countries allocated funds for women's organizations or had integrated HIV and sexual and reproductive health services *(35)*.

Commitments to strengthen gender equality must be translated into systemic improvements. This can be done by integrating gender-equality interventions (including efforts targeting gender-based violence) into national HIV programmes, assigning adequate budgets and monitoring and evaluating them for impact and accountability. Similarly, ministries mandated to improve the status and welfare of women and girls should incorporate relevant HIV policies and plans into their initiatives.

Structural interventions, such as measures to empower women economically, have been expanding, and there are indications that the efforts can cut women's risk of acquiring HIV infection by reducing their material dependence on male partners and boosting their decision-making powers. Cash transfers are an increasingly popular – and apparently effective – tool for improving the well-being and health of impoverished households, and especially of women and girls, in low- and middle-income countries *(36–38)*.

In a study in rural Malawi, girls receiving monthly cash payments were 64%[2] less likely to be living with HIV, more likely to delay their sexual debut, had fewer teenage pregnancies and were less likely to drop out of school than counterparts who did not receive the payments *(39,40)*. The cash transfers appeared to reduce the risk of HIV infection by keeping girls in school and making them less financially dependent on older male partners. This suggests that anti-poverty programmes that benefit young women can improve the terms on which they make sexual decisions. Microfinance schemes combined with gender equality and HIV training have shown promising results in reducing both intimate partner violence and reducing the vulnerability of women to HIV infection in South Africa *(41)*.

In addition to the wider benefits, enabling girls to complete their schooling can also reduce their likelihood of acquiring HIV infection. A systematic review of studies in the WHO African Region *(42)* has shown that HIV prevalence tends to decrease with a rise in educational status. In a study from a rural community in South Africa, for example, women and girls were 7% less likely to acquire HIV for each year of education they attained *(43)*; in Zambia, urban women with more than 11 years of schooling were one third less likely to have acquired HIV than their peers with seven or fewer years of schooling *(44)*. In addition, women with more education are more likely to delay marriage and childbearing, have fewer children, earn better incomes and have greater decision maker power within relationships *(45)*.

Most of the factors that put women and girls at increased risk for HIV infection also deprive them of their rights and

[2] The HIV prevalence was 64% lower in the intervention arm than in the control arm of the study.

harm their life opportunities more generally. Many of the same actions that can help reduce women's vulnerability to HIV are therefore also needed to safeguard their rights and improve their quality of life overall.

Measuring progress in overcoming gender inequality requires multiple indicators because of the multifaceted dimensions of gender equality and women's rights. HIV programmes appear to be increasingly attempting to promote gender equality in accessing and using services. The strongest efforts seem to be occurring in countries in the WHO African Region that have a high prevalence of HIV infection. The focus is less prominent in countries in which HIV infection is concentrated mainly in key populations. For example, in the Middle East and North Africa and in eastern Europe and central Asia, most national HIV responses poorly reflect gender issues. Sex-disaggregated data collection is rare, and there is little participation of women's groups and networks *(35)*. Country policies and resource allocation are particularly weak, as well, in engaging men in efforts to promote gender equality *(35,46)*.

On the positive side, recognition of the role of gender inequality in driving HIV epidemics is growing, and this is increasingly reflected in countries' national strategic plans for HIV and in the disaggregation of HIV-related data by sex. Countries now need to improve the disaggregation and analysis of these data, especially for key populations. National action plans or strategies need to include evidence-informed interventions for addressing gender inequality, including gender-based violence and harmful gender norms, with associated budgets and indicators for accountability. Further, the capacity of implementers to understand these links and to implement programmes for gender equality as part of overall HIV responses needs to continue to improve.

Chapter 11. ADVANCING HUMAN RIGHTS AND PROMOTING HEALTH EQUITY

Key Messages

Human rights and health equity dimensions are improving, but slowly

The legal environments in many countries still block or diminish the impact of HIV services, but some improvements are occurring.

- Most countries retain laws that either criminalize or sanction the persecution of people who are at higher risk of HIV infection. Many also have laws or policies that restrict the provision of certain health services that are particularly relevant to key populations, especially people who inject drugs.
- More than 50% of national governments in 2013 reported having laws, regulations or policies that can hinder effective HIV services for key populations.
- Homophobic laws and practices have serious public health consequences, yet more than 70 countries criminalized same-sex relations in 2013, and several countries have passed new laws that further criminalize lesbian, gay, bisexual and transgender people.
- Some, mostly high-income, countries are giving priority to public health approaches as alternatives to criminalizing the behaviour of certain key populations – notably sex workers and men who have sex with men.
- Although some countries retain laws that potentially discriminate outright against people living with HIV, about 68% of countries around the world reported the existence of anti-discrimination laws that specify protections for people living with HIV.
- Stigma and discrimination against people living with HIV and key populations in health care settings continue to undermine HIV responses. But countries are increasingly documenting, publicizing and acting to reduce the harmful impact of stigma and discrimination.

Overcoming structural barriers that hinder access to important health services is crucial for increasing the uptake of affordable, high-quality health services and ensuring that national HIV responses are equitable. When properly enforced, laws and policies that protect and promote human rights can reduce vulnerability to and risk of HIV infection, expand access to health services and enhance their reach, quality and effectiveness – especially for populations that are at higher risk of HIV infection.

Nevertheless, an array of legal, social and other barriers continues to prevent people who use drugs, men who have sex with men, transgender people, prisoners and sex workers from accessing effective interventions and using health services. Laws and policies that criminalize the possession of drug paraphernalia (such as clean needles and syringes to support safe injecting practices) should be reversed to expand access to health services and improve their quality. A public-health approach to changing behaviour that put people at risk of acquiring HIV infection should be promoted as an alternate to criminalization. Sentencing alternatives to incarceration should be promoted as good public health practice.

The health sector also has an important role to play in ensuring that policies, laws and regulations in other sectors support national HIV responses, especially in eliminating inequities and protecting the human rights of key populations.

11.1. Punitive laws for key populations continue to impede HIV efforts …

Most countries retain on their statute books laws, regulations or provisions that either criminalize or sanction the persecution of people who engage in sex work, men who have sex with men or people who possess drug paraphernalia (such as needles and syringes) or use drugs. In some jurisdictions, people living with HIV are subject

to prosecution for exposing others to or transmitting HIV. Other populations, including migrant and displaced people, may be particularly vulnerable in certain settings because of local laws, regulations and social norms.

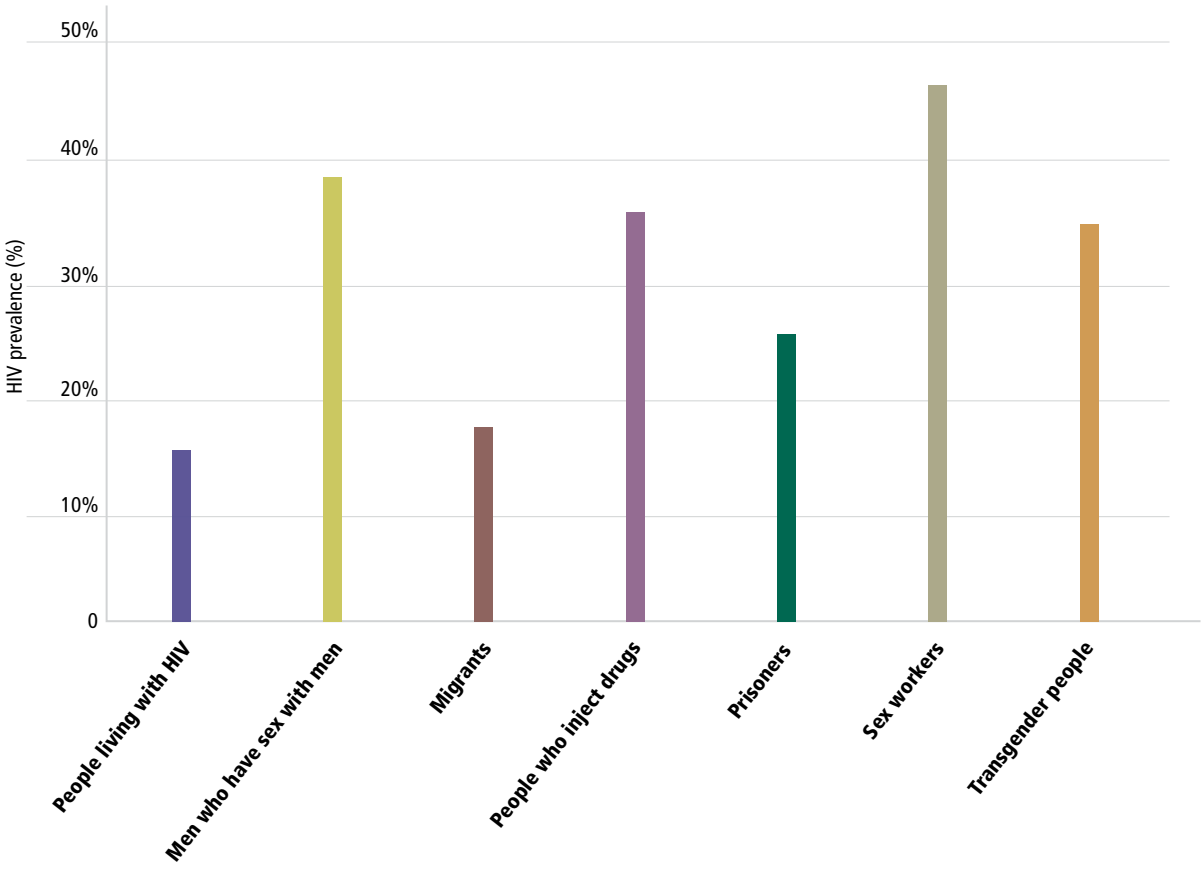
Many countries also have laws, regulations and policies that restrict the provision of certain health services that are especially relevant to key populations, including disseminating risk-reduction information, commodities (such as sterile injecting equipment and condoms) and services (such as opioid substitution therapy). In addition, laws and policies that undermine the confidentiality of health information or hinder health workers from engaging with key populations severely compromise the effectiveness of HIV programmes.

Overall in 2013, more than 50% of national governments reported the existence of laws, regulations or policies that can pose obstacles to effective HIV prevention, treatment, care and support services for key populations (Fig. 11.1) *(1)*. In the WHO European Region in 2013, for example, 46% of the 28 reporting countries confirmed the existence of such policies or legal provisions, with people who inject drugs, sex workers, prisoners and migrants most often affected *(2)*.

Punitive policies pertaining to drug use are ubiquitous and include harsh penalties for the possession or use of drugs as well as the use of compulsory detention and "rehabilitation" centres for people who use drugs. These policies often cause people who inject drugs to shun the health services they need, including services that are essential for preventing and treating HIV infection *(3)*. In many countries, the responsibility for managing drug treatment and rehabilitation programmes is not vested with health ministries but with other ministries such as those responsible for social affairs, interior affairs or drug control.

An estimated 76 countries were criminalizing same-sex relations in 2013, with some jurisdictions permitting the death penalty as punishment *(1)*. Nevertheless, the public health consequences of homophobic laws and practices are profound: as shown in a study from Uganda, where men who have sex with men who experienced homophobic abuse were five times more likely to be living with HIV than peers who had escaped such treatment *(4)*. Despite the public health importance of improving access to health services for key populations, in 2013 and 2014

Figure 11.1. Percentage of national governments reporting the existence of laws, regulations or policies that can pose obstacles to effective HIV prevention, treatment, care and support services for key populations, 2014



Source: Global AIDS Response Progress Reporting (WHO/UNICEF/UNAIDS).

Box 11.1. Some countries retain laws that criminalize people with HIV

No evidence indicates that laws that criminalize HIV non-disclosure, exposure and/or transmission support or enhance the prevention or treatment of HIV infection. On the contrary, they are more likely to undermine public health efforts that rely on the voluntary access to and use of HIV services *(6)*. Nevertheless, more than three decades into the global HIV epidemic, 63 countries have such laws in at least one jurisdiction. Several other countries have pursued such prosecutions based on general criminal law offences such as sexual assault, grievous bodily harm, manslaughter or attempted homicide *(6)*. As recommended by the Global Commission on HIV and the Law, some countries (including Congo, Fiji, Guinea, Senegal and Togo) have begun reviewing such laws, are restricting their use or have repealed them.

several countries passed new laws that further criminalize certain key populations, notably lesbian, gay, bisexual and transgender people, along with the organizations and people who support them *(5)*.

Many countries criminalize the selling or purchasing of sex. Such criminalization contributes to violent and unsafe working conditions, restricts access to critical health services, including for sexual and reproductive health, and impedes the negotiation of safer sex practices, including consistent condom use. Compulsory HIV testing or treatment of sexually transmitted infections and the use of "re-education" programmes further alienates sex workers from health services.

These approaches often violate human rights, sanction and encourage discrimination and undermine public health efforts and the broader goal of health equity – by impeding access to health services for key populations and vulnerable groups *(6)*. Even when such laws are not routinely enforced, punitive legal environments feed stigma and social marginalization, legitimize discrimination and facilitate harassment by law enforcement officials, which disrupt the provision of HIV and other health services *(7,8)*.

There are strong arguments for removing such legal and policy barriers on public health grounds. Such an approach can expand access to health services and their use, especially for the prevention, treatment and care of HIV infection. Health care workers and other HIV service providers also need to have legal protection that enables them to provide confidential, evidence-informed and high-quality services to the people who are vulnerable and most affected.

WHO and its partners continue to promote the adoption of policies, practices and laws that protect human rights, promote equity and eliminate discrimination in the health sector. WHO guidelines on the treatment of opioid dependence recommend that treatment not be compulsory *(9)*. In recent years, increasing attention has focused on the efficacy and human rights aspects of compulsory drug treatment programmes. In 2009, following an assessment of compulsory drug treatment centres in four Asian countries, WHO recommended a transition from compulsory treatment programmes to ones that are voluntary and evidence-informed *(10)*. Twelve United Nations agencies in 2012 jointly urged the closing of compulsory drug detention and rehabilitation centres *(6)*, and the Global Fund to Fight AIDS, Tuberculosis and Malaria in 2013 reaffirmed its position that it would not support any programmes that infringe on human rights, including compulsory drug treatment centres *(11)*. Nevertheless, compulsory treatment centres continue to exist in a range of countries, with programmes in some countries being so severe that a United Nations Special Rapporteur on torture or other cruel, inhuman or degrading treatment or punishment singled them out for denunciation in 2013 *(12)*.

Further, WHO guidelines on the prevention and treatment of HIV and other sexually transmitted infections for sex workers *(13)* and men who have sex with men and transgender people *(14)*, endorsed by the United Nations Development Programme (UNDP), the United Nations Population Fund (UNFPA) and UNAIDS, recommend that countries work towards decriminalizing these populations and eliminating the unjust application of laws and regulations against them *(6)*.

Box 11.2. Countries are abandoning travel-related HIV restrictions

HIV-related restrictions on entry, stay and residence are not justified by public health considerations (*19*). A growing number of countries recognize as much and have removed HIV-related restrictions on entry, stay and residence. From 2000 to early 2014, the number of countries, territories and areas with HIV-related travel restrictions fell by more than half – from 96 to 41 countries *(6,20)*. Advocacy from WHO, UNAIDS and networks of people living with HIV have facilitated this trend towards removing such restrictions in recent years, including in China and the United States of America. Countries in the WHO Eastern Mediterranean Region and Western Pacific Region were most likely to maintain such restrictions.

11.2 … but laws and practices that give priority to public health concerns are becoming more common

Several countries have begun shifting towards approaches that reflect public health considerations. A few, mostly high-income countries, have decriminalized the behaviour of certain key populations – notably sex workers and men who have sex with men *(15)*. Courts in several other countries (including in Fiji, Nepal, Pakistan and the Philippines) have handed down judgements that could improve the legal environment for men who have sex with men *(15)*.

Generally, however, the HIV services for key populations in too many countries continue to operate in legal environments that block or diminish their effectiveness.

Although some countries retain laws that potentially discriminate outright against people living with HIV (Box 11.1), many others have introduced anti-discrimination laws that prohibit discrimination against people in health settings, and countries have also introduced laws that protect people from discrimination on the basis of sexual orientation, sexual identity or HIV status. Preliminary data show that in 2014, 68% of reporting countries globally indicated the existence of anti-discrimination laws that specify protections for people living with HIV *(2)*.

Formal protections, however, do not automatically shield people against discrimination and rights violations. Countries must therefore also expand access to legal aid services to help individuals obtain legal redress when their rights have been violated, and they should supplement this support with practical enforcement mechanisms.

By June 2014, nongovernmental organizations from 59 of 115 reporting countries stated that legal aid systems for HIV casework were available in their countries *(2)*. However, other evidence suggests that many people who experience rights abuses fail to seek or obtain redress along legal channels. In 17 of 23 countries with surveys that examined the use of legal redress, fewer than 30% of people living with HIV who had experienced rights violations reported seeking redress *(6)*. Where these services exist, lack of awareness or distrust of the services is a major reason for low levels of use. However, many countries have no HIV-related legal services that might help individuals traverse bureaucratic processes for legal redress that often are complex and unaffordable. Legal services are more likely to be used if they are offered free of user charges or at reduced fees, and an increasing number of countries are providing such services: in 2012, 52% of countries reporting having free or reduced-cost legal services (mainly through private-sector law firms or university-based facilities), up from 39% in 2008 *(6)*.

More than 60 countries in 2013 had at least one jurisdiction that allowed for prosecuting HIV non-disclosure, exposure and/or transmission (Box 11.1) *(6)*. Laws that violate or undermine human rights principles need to be revised, and the legal and policy frameworks should be reviewed and, if necessary, strengthened to ensure that they minimize vulnerability, facilitate the adoption of less risky behaviour and encourage equitable access to and the use of essential health services, including HIV programmes.

11.3 Stigma and discrimination endures but is gradually being confronted

Stigma and discrimination against people living with HIV and members of key populations in health care settings, and among health care workers, continues to undermine HIV responses, including the provision and uptake of treatment and care *(16)*. Countries are increasingly documenting and reporting on the harmful impact of stigma and discrimination and are acting to minimize these harms. In the WHO European Region, for example, 24 countries reported having programmes for reducing HIV-related stigma and discrimination that target health care workers, the media and places of work.

By 2013, 50 countries had conducted surveys and reported on the research using the People Living with HIV Stigma Index *(17)*. The surveys confirm that stigma and discrimination continues to be widespread, contributing to serious psychological and health costs on people living with HIV. These and other findings led the Global Commission on HIV and the Law to urge countries to immediately move towards repealing punitive laws and prohibiting discrimination against people living with HIV.

Interventions that address stigma and discrimination in the social, institutional and policy realms are most likely to be effective *(16)*. They include initiatives to repair or strengthen social networks, removing laws that sanction discrimination and interventions to discourage or prevent discriminatory practices, especially within the health and social sectors *(18)*.

Instead of stigmatizing and marginalizing people living with HIV and key populations, many countries are more closely involving them in designing, implementing and evaluating their HIV programmes. Nongovernmental organizations representing people living with HIV and/or key populations in 63 of 115 countries reporting by June

2014 stated that they had been closely involved in the planning and budgeting processes of national strategic or activity plans for HIV *(2)*.

A growing number of countries have formalized the involvement of civil society entities in their national HIV responses. By June 2014, 104 of 117 countries (89%), as reported through the National Commitments and Policies Instrument (NCPI) *(2)*, had a mechanism to promote interaction between government, civil society representatives and the private sector as HIV strategies and programmes are implemented. An officially recognized HIV coordinating body existed in 103 of 117 reporting countries, and it included civil society representatives in 98 of these countries.

WHO has taken important steps to further strengthen the engagement of civil society in WHO processes and to move towards more systematic forms of collaboration. Civil society continues to act as a key partner in conceptualizing, developing, implementing and monitoring the various WHO guidelines for HIV. For example, people living with HIV and key populations have been represented on the guideline development groups for WHO guidelines on the strategic use on antiretroviral drugs and comprehensive HIV services for key populations. WHO has also established a global Civil Society Reference Group on HIV, which advises WHO on its HIV policies and programmes, helps to identify areas for collaboration and facilitates dissemination of WHO policies, guidelines and tools through civil society networks. All six WHO regional offices collaborate regularly with regional civil society organizations and networks.

11.4 Realizing the right to health and improving equity in health

The right to health comprises both timely health care, which is appropriate to the health needs of individuals and populations, and addresses the underlying determinants on health (such as nutrition and health-related information and education). Moreover, the right to health requires that good-quality services be made available, accessible and acceptable to the entire population, without causing financial hardship, and with priority attention given to marginalized population groups.

Various strategies are being promoted to improve the equitable uptake and utilization of health services to maximize their impact across the broad range of health needs of the population and to retain people in care. For example, food security programmes and policies are increasingly used to promote the well-being of people living with HIV, improve ART adherence and outcomes and support a sustainable transition from food assistance in HIV treatment settings. By reducing the economic burden of illness and by improving ART tolerance, food interventions (provided in the form of food or as cash transfers and vouchers) can increase ART access, acceptance and adherence, thereby enhancing treatment outcomes. Providing high-energy nutritious foods, in particular, enhances the nutritional recovery of people on ART and encourages them to continue taking their medications. Addressing food insecurity as a structural barrier to accessing and adhering to ART can therefore increase the number of people enrolling and remaining on treatment.

Structural barriers (such as the need to travel long distances) can severely compromise HIV testing uptake, treatment initiation and treatment adherence. The decentralization of services, the use of task-shifting and the deployment of community health workers can bring services closer to remote or rural communities (see Chapter 9). Services can be made more acceptable and accessible by providing flexible operating hours and by engaging community health workers and peers in service delivery, especially for marginalized and criminalized populations (see Chapter 7). Access to HIV services can be improved by linking or integrating them more strongly with other health services (see Chapter 8), which in turn can aim to address the full health needs of individuals.

Access to accurate information is vital. Health care providers and peers have a key role to play in educating people about treatment options, risks and benefits, including the potential prevention benefits of ART, for example, and to improve the legal literacy of patients so that they are able to fully exercise their rights.

The right to health also requires that services be affordable, including to the population groups with the lowest incomes. In practice, this often means that services need to be free of user charges. Even when laws are in place to guarantee free services, however, out-of-pocket payments and corruption at the point of service remain common practices in many parts of the world. In many settings where the state guarantees access to ARV drugs free of charge, HIV still presents major health costs related to broader care: tests to monitor CD4 cell counts and viral load, for example, are not always covered under provisions for treatment that is ostensibly free of user charges. Other associated costs – transport to the clinic to receive treatment and loss of earnings from time off for treatment – can also be prohibitively high. Such costs are often reported as a significant factor limiting treatment adherence *(21)*.

Being able to use health services with dignity and respect is another important aspect of the right to health, as are arrangements that can ensure that services are responsive to gender, language, culture,

age and other specificities. People living with HIV and other key populations continue to encounter dismissive attitudes from health workers and other social service providers *(17)*. Health workers need human rights and medical ethics training and should be held to account for breaches of conduct.

Investing in treatment and legal literacy, legal services, training for health care workers and law enforcement officials and reducing stigma and discrimination can help realize people's right to health, as can removing laws and policies and curbing practices that impede the fulfilment of that right.

CONCLUSION

The remarkable progress made in the global HIV response during the past three years is beyond question. After 30 years, HIV epidemics continue to present new challenges, and the HIV response also continues to generate innovation and leadership in many aspects of public health.

New approaches and technologies provide the tools to effectively prevent, diagnose, treat and care for HIV infection; diverse funding instruments, including increasing domestic funding, provide the means for delivering high-quality interventions to increasing numbers of people; health and community systems are being strengthened to deliver more efficient and sustainable programmes; and broader health issues are benefiting greatly from HIV investment and learning.

The accomplishments are impressive. About 12.9 million people were receiving ART globally at the end of 2013, of whom 11.7 million were in low- and middle-income countries. The target of having 15 million people receiving ART in 2015 is therefore within reach. The successes in eastern and southern Africa have been especially remarkable, and many countries in Latin America and Asia have consolidated the progress made with their HIV responses.

At the same time, there is a sobering reality that the number of people newly infected with HIV still eclipses the number of people starting HIV treatment each year: too many people are acquiring HIV, and not enough people eligible for treatment in accordance with WHO guidelines are receiving it. Progress is also uneven and tends to be slower in areas in which the required focus is lacking and in which targets are defined less clearly – for example, HIV prevention, improving the quality and efficiency of services, strengthening health and community systems and creating enabling environments.

A significant number of countries lag behind in delivering core HIV interventions. In many places, access to appropriate services for adolescents is inadequate and the expansion of services for children has not kept pace with those for adults. In addition, certain populations continue to be ignored or discriminated against, and the quality of programmes and impact achieved vary considerably. Furthermore, the strategic information that is needed to guide more effective policies and programmes is often missing or of erratic quality.

There have also been disturbing reversals on some fronts. Most obvious are policies and practices that contribute to prolonging, escalating or catalysing HIV epidemics among key populations. The incidence of HIV infection is increasing dramatically in some populations of men who have sex with men, including in communities that had successfully contained epidemics in the past. Barriers continue to block the delivery of evidence-based harm-reduction programmes for people who inject drugs, and some countries are imposing increasingly punitive measures against sex workers and men who have sex with men. Many HIV programmes also continue to ignore the realities and needs of transgender people. These setbacks are undermining the broader progress of the past three years.

Progress in implementing strategic direction 1 (optimize HIV outcomes) has been solid. In the past three years, HIV programmes have benefited greatly from innovations in prevention (such as the diversified use of ARV drugs for HIV prevention and developing male circumcision devices), diagnosis (with emerging point-of-care diagnostics and improving approaches for early infant diagnosis as well as self- and community-based testing), treatment (with optimized ARV drugs and ART regimens and improved service delivery models), and care (such as improved management of coinfections, including TB). Promising new treatments for chronic HCV infection offer a huge opportunity if they can be implemented at scale. International efforts to eliminate the mother-to-child transmission of HIV are intensifying, and countries are increasingly pursuing the goal of dual elimination of HIV and syphilis by strengthening maternal, newborn and child health services. Comprehensive packages for specific populations and settings are also more clearly defined and promoted.

However, major challenges remain. The coverage and uptake of core HIV prevention interventions, such as female and male condoms and harm reduction, need to be enhanced. The treatment coverage gap between children and adults continues to widen. Early diagnosis of HIV infection among infants and treatments for children should improve, and high-quality services must reach adolescents, especially as they transition from child to adult services. Programmes have to identify people living with HIV early so that they can gain the full benefits of ARV drugs. In addition, adherence and retention in care need to improve to achieve long-term viral suppression.

Actions under strategic direction 2 (leverage broader health outcomes) have led to promising results. Collaboration between HIV and TB programmes has fostered model programmes for integrating HIV and TB service delivery. HIV programmes have stimulated the development and implementation of comprehensive harm-reduction programmes for people who use drugs in some countries, which now include interventions to prevent opioid overdose as well as prevention and management of hepatitis B and C.

The commitment to eliminate new HIV infections among children now also encompasses eliminating congenital syphilis and strengthening maternal, newborn and child health services overall. A new focus on noncommunicable

diseases has alerted HIV programmes to the need to address ageing populations of people living with HIV and the noncommunicable disease complications of HIV infection and ART. There appears to be significant progress in successful integration and programme linkage, but widely accepted methods are yet to be settled for measuring such progress, assessing the cost-effectiveness and impact of integrated or linked services and determining how best to organize such services.

There have been many successes under strategic direction 3 (strong and sustainable systems). However, similar to strategic direction 2, measuring and quantifying the overall benefits has been difficult. HIV programmes have spearheaded innovations in almost all aspects of health and community systems. Despite concerns that the pressures of HIV programmes might overwhelm health systems, in many countries health services – including primary health care, outreach services and laboratory systems – are now stronger and more versatile. The global HIV response has shown the following:

- When the governance and management of health services becomes more inclusive, the reach and quality of these services tends to improve.
- Chronic care systems can provide comprehensive and integrated management across a range of health conditions and populations.
- Access to high-quality medicines, diagnostics and other commodities can be significantly increased and safeguarded through prequalification, strengthened procurement and supply management systems, interventions that reduce prices and simplified treatment regimens and monitoring approaches.
- Despite human resource constraints, the prudent use of decentralization and task shifting and the deployment of community health workers boost the access to and uptake of health services.
- Health information systems for HIV provide critical information that informs broader health policies and planning.
- Health system financing can be transformed, both at the international and domestic levels, to ensure sustainability of programmes and provide financial protection for those in need of services.
- Actively engaging affected populations and the broader community contributes to more equitable, acceptable and efficient services.

Finally, under strategic direction 4 (reduce vulnerability and remove access barriers), HIV investment has elevated advocacy efforts around health equity, gender equality, human rights, vulnerability, stigma and discrimination. Many of the challenges are recognized, effective interventions exist and political commitment to heed sound public health principles appears to be increasing. However, serious concerns remain. In too many countries, appropriate action is still irresolute or entirely absent. Stronger public health advocacy needs to be mobilized to promote appropriate policies and programmes, recognizing that human rights are central to good public health practice.

This review shows that the WHO Global Health Sector Strategy framework has stood the test of time and that the overall goal, targets and strategic directions have remained relevant over the past three years for guiding the global HIV response.

Although attesting to the significant gains made since the launch of the strategy, the review also highlights important questions: could we have achieved more? Have we fully exploited the many opportunities at hand and applied new knowledge and tools rapidly enough? Have we made the most efficient use of funds and human resources and capitalized fully on the considerable political will that has been generated? The answers to these questions and the other lessons learned since 2011 should inform implementation of the remaining two years of the strategy while preparing for a new HIV strategy beyond 2015.

The current phase in the global HIV response positions HIV within a much broader health and development agenda. The post-2015 development agenda will need to address the unfinished business of the Millennium Development Goals and the commitments to universal access for HIV prevention, treatment, care and support. Indeed, health features prominently in the discussions leading to the formulation of the post-2015 sustainable development goals, while HIV is generally recognized as a cross-cutting issue that warrants consideration across a range of development areas. Such a perspective has the potential to significantly shift the direction of public health and, with it, the HIV agenda.

Prominent in the emerging thinking is the concept of universal health coverage that ensures that all people have access to health services of sufficient quality to be effective and do not suffer financial hardship in doing so – a concept that will help guide the next phase of the HIV response.

For years now, HIV responses have been blazing a trail for universal health coverage, showing that well-defined packages of life-saving interventions can be introduced in unfavourable and even hostile circumstances and that they can be scaled up and sustained.

By applying the principles of universal health coverage, with a greater emphasis on quality, health equity and social and financial security, HIV responses can be accelerated and strengthened further in ways that benefit the broader public health and development agendas.

EXPLANATORY NOTES

Methods of data collection and validation

Most of the health sector response data presented in this report were collected by WHO, UNICEF and UNAIDS through the joint Global AIDS Response Progress Reporting and health sector reporting processes *(1)*, unless stated otherwise. Country data were submitted based on guidance to national AIDS programmes and partners on the use of core indicators for measuring and reporting on national HIV responses. Countries submitted data between March and April 2014, using the joint online reporting system. A data validation process followed the country submission. Country-level data will be published online at the WHO website *(2)*.

The country offices of WHO, UNICEF and UNAIDS worked jointly with national counterparts and partner agencies to validate data in a single collaborative consultation process. When discrepancies or inconsistencies were identified in the reported data, national authorities were asked to clarify or resolve them.

The health sector response data for HIV and the WHO/UNAIDS epidemiological estimates are updated annually, including for previous years. The data presented in this report therefore supersede those from all previous reports.

Country policies and practices

WHO maintains an internal database on HIV-related policies and practices in countries. The database is populated with information provided by countries through the Global AIDS Response Progress Reporting and with additional information provided by WHO staff. The sources of information are documented for each information element.

The database currently focuses on information for 58 WHO HIV focus countries. These countries have been identified based on an existing global set of priority countries for various initiatives (especially the 38 high-impact countries of the UNAIDS United Results, Budget and Accountability Framework *(3)* and the 22 priority countries for the Global Plan towards the elimination of new HIV infections among children and keeping their mothers alive *(4)*) as well as additional countries identified by WHO regional offices as having strategic importance. WHO staff members in countries regularly validate and update the information in the database.

Number of people 15 years and older who received HIV testing and counselling and know the results

The number of adults who received HIV testing and counselling in the past 12 months and know the results in a given country is collected from routine reports from all service points, including voluntary counselling and testing sites, clinics, hospitals and nongovernmental organization outreach points. The data are compiled at the district or local level and then finally at the national level. A total of 101 countries reported data for 2013; data from 29 countries were imputed from the latest available year. These data are not corrected for the fraction of people who have been tested more than once in the year.

Data are presented on the availability of HIV testing and counselling services at the national level for adults in 77 low- and middle-income countries for 2009 and 2013.

Number of people receiving antiretroviral therapy

For December 2013, 126 of the 144 low- and middle-income countries had provided data on access to antiretroviral therapy (ART). These 126 countries accounted for 94% of the people receiving treatment at the end of 2013. An additional four countries (Ethiopia, Islamic Republic of Iran, Lesotho and Thailand) submitted data for cut-off points between September and November 2013. Together, these 130 countries represented more than 99%

of the total estimated number of people receiving ART at the end of 2013 in low- and middle-income countries. One country submitted data for June 2013. Only 13 countries, all with relatively small HIV epidemics, did not report these data for 2013.

The reported data on people currently receiving ART in low-, middle- and high-income countries were compiled from the most recent reports provided by health ministries or other reliable sources in the countries, such as bilateral partners, foundations and nongovernmental organizations that are major providers of treatment services. WHO, UNICEF and UNAIDS work with countries to obtain as many facility-specific data as possible on the numbers of people receiving treatment.

Estimating the number of people receiving ART involves some uncertainty for countries that have not yet established regular reporting systems for capturing accurate data on people who initiate treatment for the first time, people who discontinue treatment, people who are lost to follow-up and people who die.

Uncertainty may also arise because of difficulty in measuring the extent of ART provided in the for-profit and not-for-profit private sectors. Some people receive treatment through nongovernmental organizations and/or private clinics that do not report through official channels in some countries. Private companies may have programmes to support the provision of ART to workers with advanced HIV disease but do not necessarily report these data to the public health authorities. When available, data from the private sector have been included.

In addition, the report presents the most recent available data from high-income countries.

Estimating treatment eligibility and coverage

Standard methods were used for estimating the size and course of the HIV epidemic, number of people living with HIV, number of people newly infected and mortality attributable to AIDS *(5,6)*. Under the 2013 WHO consolidated ARV guidelines *(7)*, roughly 85% of all people living with HIV would be eligible for treatment in 2013. Countries are currently at various stages of adopting the global ART eligibility recommendations. For reasons of comparability across countries and over time in the context of changing recommendations, this report relates the number of people receiving ART to the overall number of people living with HIV receiving ART. The ranges around the levels of people living with HIV who were receiving ART are based on the uncertainty bounds around the estimates of people living with HIV *(8)*.

The uncertainty bounds reflect the certainty associated with each of the estimates: the wider the bounds, the greater the uncertainty surrounding an estimate. The extent of uncertainty depends mainly on the type of epidemic, the quality, coverage and consistency of a country's surveillance system and, in generalized epidemics, whether or not a population-based survey with HIV testing was conducted.

Prevention of mother-to-child transmission

Number of pregnant women living with HIV receiving ARV medicine for preventing mother-to-child transmission

The number of pregnant women living with HIV and who are receiving ARV medicine for preventing mother-to-child transmission is based on national programme data that are aggregated from facilities or other service delivery sites, as reported by countries. In a few countries where national data are not available, the value is estimated through a special survey or sentinel sites to assess the coverage of antiretroviral (ARV) medicines among pregnant women living with HIV, and this percentage has been applied to the estimated number of pregnant women living with HIV to derive an estimate for the number of pregnant women living with HIV receiving ARV drugs for preventing mother-to-child transmission.

A total of 120 countries reported these data for 2013; together, they accounted for nearly all of the estimated pregnant women living with HIV in low- and middle-income countries. This report focuses on the 22 priority countries of the Global Plan towards the elimination of new HIV infections among children and keeping their mothers alive *(4)*.

The estimated coverage of ARV medicine for preventing mother-to-child transmission of HIV includes only the most effective regimens (ART and combination regimens) and excludes single-dose nevirapine, which WHO no longer recommends.

Estimating the number of pregnant women living with HIV (who are all eligible for ARV medicine for preventing mother-to-child transmission)

The number of pregnant women living with HIV who are eligible for ARV medicine for preventing the mother-to-child transmission of HIV is estimated using standardized statistical modelling. This is based on UNAIDS/WHO methods that consider various epidemic and demographic parameters, such as the HIV prevalence among women of reproductive age and the effect of HIV on fertility *(5)*. The uncertainty ranges for these estimates are generated based on these parameters. Regular scientific updates have been provided on these tools *(9)*.

Coverage of pregnant women living with HIV receiving ARV medicine for preventing mother-to-child transmission

The coverage of ARV medicine for preventing the mother-to-child transmission of HIV is calculated by dividing the number of pregnant women living with HIV who received ARV medicine for preventing mother-to-child transmission of HIV in 2012 by the estimated number of pregnant women living with HIV in a given country.

The ranges around the levels of coverage are based on the uncertainty ranges around the estimates of pregnant women living with HIV.

Classification of countries

Classification by income

Unless stated otherwise, all data analysis in this report is based on data from the 144 countries the World Bank classified as low- and middle-income countries as of July 2011 *(10)*, the classification valid at the time when the global targets were set in the United Nations Political Declaration on HIV and AIDS. The economies are classified as low, middle or high income according to the gross national income per capita, calculated using the World Bank Atlas method (to reduce the effect of exchange-rate fluctuation). The groups are:

- low-income, US$ 1005 or less;
- lower-middle income, US$ 1006 to US$ 3975, and upper-middle income, US$ 3976 to US$ 12 275; and
- high-income, US$ 12 276 or more.

Classification by HIV epidemic level

HIV epidemics are categorized as low-level, concentrated and generalized based on the following principles and numerical proxies.

Low-level

Principle. Although HIV infection may have existed for many years, it has never spread to significant levels in any subpopulation. Recorded infection is largely confined to individuals with high-risk behaviour, such as sex workers, people who inject drugs and men who have sex with men. This epidemic state suggests that networks of risk are rather diffuse (with low levels of partner exchange or sharing of drug-injecting equipment) or that the virus has been introduced very recently.

Concentrated

Principle. HIV has spread rapidly in a defined subpopulation but is not well established in the general population. This epidemic state suggests active networks of risk within the subpopulation. The frequency and nature of links between highly infected subpopulations and the general population determines the future course of the epidemic.

Generalized

Principle. In generalized epidemics, HIV is firmly established in the general population. Although populations at higher risk may continue to contribute disproportionately to the transmission of HIV, sexual networking in the general population is sufficient to sustain an epidemic independent of populations at higher risk of infection and transmission.

Classification of Member States by WHO region

This report presents data on low- and middle-income countries classified by WHO region. WHO has 194 Member States grouped in six regions, and 144 of these are low- and middle-income countries: the WHO African Region (n = 45); WHO Region of the Americas (n = 29); WHO Eastern Mediterranean Region (n = 16); WHO European Region (n = 22); WHO South-East Asia Region (n = 11); and WHO Western Pacific Region (n = 21). There are 50 high-income countries.

Rounding of numbers

Throughout the report, analyses performed on health sector response data and UNAIDS/WHO estimates are based on unrounded data. However, for presentation purposes, most numbers have been rounded to facilitate interpretation of the data. As a result, in some cases percentages may not add up to the totals shown in tables because of rounding.

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CHAPTER 2

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CHAPTER 7

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CHAPTER 8

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CHAPTER 11

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