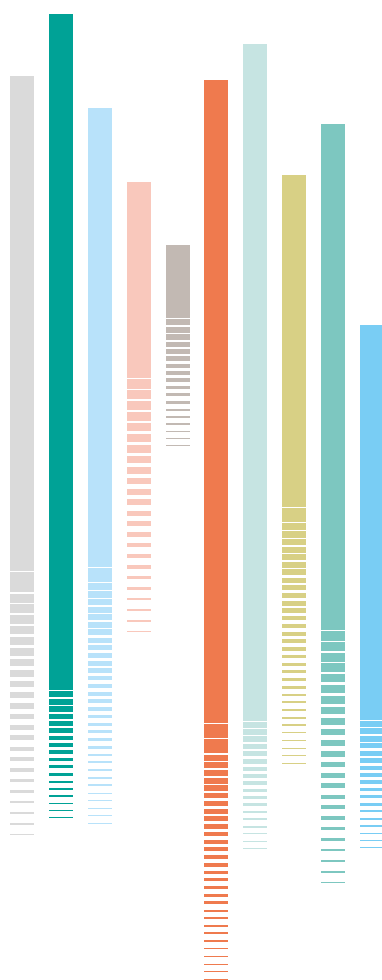


# ENDING AIDS

## PROGRESS TOWARDS THE 90-90-90 TARGETS



# ENDING AIDS

PROGRESS TOWARDS THE  
90-90-90 TARGETS

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# FOREWORD

When I launched the 90–90–90 targets three years ago, many people thought they were impossible to reach. Today, the story is very different. Families, communities, cities and countries have witnessed a transformation, with access to HIV treatment accelerating in the past three years. A record 19.5 million people are accessing antiretroviral therapy, and for the first time more than half of all people living with HIV are on treatment. More countries are paying for HIV treatment themselves. More people living with HIV are employed, more girls are in school, there are fewer orphans, there is less ill health and less poverty. Families and communities are feeling more secure.

With science showing that starting treatment as early as possible has the dual benefit of keeping people living with HIV healthy and preventing HIV transmission, many countries have now adopted the gold-standard policy of treat all. Our efforts are bringing a strong return on investment. AIDS-related deaths have been cut by nearly half from the 2005 peak. We are seeing a downward trend in new HIV infections, especially in eastern and southern Africa, where new HIV infections have declined by a third in just six years. This good news is a result of the combined effect of a rapid scale-up of treatment and existing HIV prevention interventions. Moving forward, every additional dollar invested in AIDS will deliver a US\$ 8 return.

But our quest to end AIDS has only just begun. We live in fragile times, where gains can be easily reversed. The biggest challenge to moving forward is complacency.

Global solidarity and shared responsibility has driven the success we have achieved so far. This must be sustained. But for several years now, resources for AIDS have remained stagnant, and we are not on track to reach the US\$ 26 billion of investment we need by 2020. Without more domestic investments and international assistance, we cannot push faster on the Fast-Track. More people will become infected with HIV and lives will be lost. Without more community health workers, health systems will remain stretched. Without changing laws, key populations will be left behind.

We must not fail children, women and girls, young people and key populations. We must engage with men differently. Men are being left behind in the push to 90–90–90, in turn affecting the lives of women and children.

I remain optimistic. This report clearly demonstrates the power of the 90–90–90 targets and what can be achieved in a short time. It shows that innovations are possible at every level—from communities to research laboratories, from villages to cities. It illustrates the power of political leadership to make the impossible possible.

**Michel Sidibé**  
UNAIDS Executive Director

## 1. INTRODUCTION:

# TRANSFORMING THE 90-90-90 VISION INTO REALITY

Since they were launched at the 20th International AIDS Conference in Melbourne, Australia, in 2014, the 90-90-90 targets have become a central pillar of the global quest to end the AIDS epidemic. The targets reflect a fundamental shift in the world's approach to HIV treatment, moving it away from a focus on the number of people accessing antiretroviral therapy and towards the importance of maximizing viral suppression among people living with HIV (Figure 1.1). This shift was driven by greater understanding of the benefits of viral suppression—not only does treatment protect people living with HIV from AIDS-related illness, but it also greatly lowers the risk of transmitting the virus to others.

### EMPHASIZING VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV

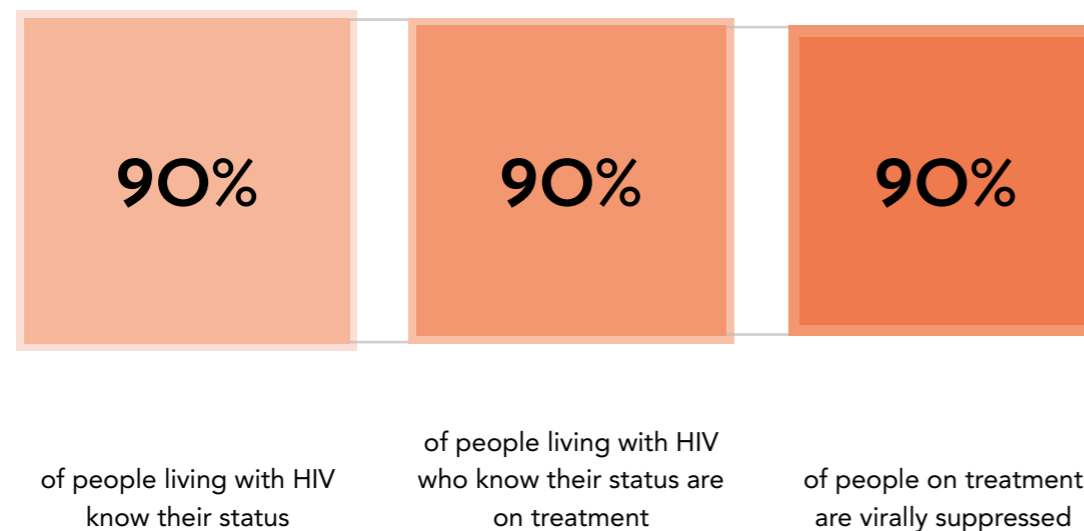


FIGURE 1.1. THE 90-90-90 TARGETS FOR 2020

## REACHING THE 90-90-90 TARGETS IN REGIONS, COUNTRIES AND COMMUNITIES

As the world approaches the midway point between the 2014 launch of the 90-90-90 targets and their December 2020 deadline, UNAIDS has reviewed the progress made. This has been done with the support of national AIDS programmes, which report data annually to the United Nations and the guidance of national programme managers, researchers and other experts within the UNAIDS Scientific and Technical Advisory Committee (STAC) on 90-90-90.

The latest epidemiological estimates and programme data from 168 countries in all regions reveal progress and gaps across the HIV testing and treatment cascade. Changes in HIV policy since 2014 were also reported by countries, as were the development and roll-out of innovations in technology and service delivery. Consistent with the commitment to leave no one behind in *Transforming our world: the 2030 agenda for sustainable development*, UNAIDS and its partners reviewed and synthesized country data and studies that revealed the particular challenges and strategies for securing the full preventive and therapeutic benefits of antiretroviral therapy among children, young people, women, men and key populations at higher risk of HIV acquisition.

**Substantial progress has been made towards the 90-90-90 targets and a major milestone has been reached: for the first time, more than half of all people living with HIV are on treatment.**

The data show that substantial progress has been made towards the 90-90-90 targets. More than two thirds of all people living with HIV globally knew their HIV status in 2016. Among those who knew their HIV status, 77% [57– >89%] were accessing antiretroviral therapy, and 82% [60– >89%] of people on treatment had suppressed viral loads. Amid this progress, a major milestone was reached in 2016: for the first time, more than half of all people living with HIV (53% [39–65%]) were accessing antiretroviral therapy.

This acceleration of HIV testing and treatment—within a comprehensive approach that includes condoms, voluntary medical male circumcision, pre-exposure prophylaxis (PrEP), and efforts to protect human rights and establish an enabling environment for service delivery—has contributed to a 32% global decline in AIDS-related deaths and a 16% global decline in new HIV infections between 2010 and 2016.

In eastern and southern Africa, the region most affected by the epidemic, gains across the three 90s have been particularly striking, bringing the region to a level of progress comparable to Latin America. If progress is sustained, these two regions will likely achieve the 90-90-90 targets alongside western and central Europe and North America. The Caribbean was near the global average for the second 90, but lagged behind on the first and third 90s. Asia and the Pacific, by contrast, was near the global average for the first and third 90s, but lagged behind on the second 90. Other regions are in danger of missing the 2020 deadline.

*Fully achieving the 90–90–90 targets translates into 73% of all people living with HIV being virally suppressed. Seven countries had achieved this by 2016: Botswana, Cambodia, Denmark, Iceland, Singapore, Sweden and the United Kingdom.*

Fully achieving the 90–90–90 targets translates into 73% of all people living with HIV being virally suppressed. Across the globe, seven countries had already achieved or exceeded this level of viral suppression by 2016: Botswana, Cambodia, Denmark, Iceland, Singapore, Sweden and the United Kingdom of Great Britain and Northern Ireland. An additional 11 countries were near this threshold: Australia, Belgium, France, Germany, Italy, Kuwait, Luxembourg, Netherlands, Spain, Swaziland and Switzerland. Several cities engaged in the Fast-Track Cities Initiative have also reached, or are close to reaching, the 90–90–90 targets, including Amsterdam, Melbourne, New York City and Paris.

Pioneering efforts to expand services into community settings in eastern and southern Africa have demonstrated that the 90–90–90 targets can be achieved in low-income, high-prevalence settings within just a few years.

Among them, the Sustainable East Africa Research in Community Health (SEARCH) study has produced exceptional results (see box). These initiatives have built upon a collective body of work by community-based organizations and community health workers that have been supporting public health systems across the world to deliver HIV services more widely and equitably since the earliest days of the AIDS response. Together, their lessons have informed the emergence of the differentiated care model: a client-centred, rights-based approach that simplifies and adapts HIV services across the cascade to better serve the needs of people living with HIV and increase the efficiency of the health system.

## ACHIEVING THE FIRST 90

Globally, progress made in improving knowledge of HIV status in 2016 was lower than progress in other areas of the cascade, with gaps in knowledge of HIV status often largest among young people and men. Knowledge of HIV status is the first step in the cascade, and when it is low, subsequent efforts to enrol people living with HIV into care and to initiate and sustain treatment are affected.

Closing those gaps requires making HIV testing an increased priority and taking full advantage of new technologies and innovative service strategies. Rapid roll-out and promotion of self-testing is one of several strategies for moving the locus of testing from health facilities to community settings. The UNITAID-supported HIV Self-Testing Africa (STAR) project is demonstrating that self-testing can reach many people who do not seek HIV tests in health facilities, and that people with a reactive (positive) self-test can consistently be linked to a confirmatory diagnosis and HIV treatment initiation. Assisted partner notification, point-of-care early infant diagnosis and virological testing at birth are additional opportunities for increasing knowledge of HIV status among adults and children living with HIV.

## ACHIEVING THE SECOND 90

For the second 90, adoption of a treat all approach and same-day initiation, along with increasing investment in scaled-up community-based strategies, will be critical to success. This will require rapid expansion of proven models for linking newly diagnosed individuals to care and refining clinic operations to improve efficiency, empower clients and expedite treatment uptake. Lessons from the remarkable results achieved by the SEARCH and HPTN071 (PopART) studies also must be taken on board, including the strategic use of trained community health workers and adoption of a holistic approach that treats not only HIV but the entire health needs of the client. New antiretroviral medicines such as dolutegravir can suppress viral loads more quickly, and they have fewer side-effects, are less prone to resistance and have the potential to lower treatment costs and make treatment programmes more sustainable.

## ACHIEVING THE THIRD 90

Although most people accessing antiretroviral therapy obtain excellent clinical outcomes, important opportunities exist to improve and maintain rates of viral suppression. It is critical for treatment programmes to establish community-centred strategies and systems that support patient adherence to treatment and reduce the number of patients lost to follow-up. Strategies that use peers and trained community health workers generally achieve retention rates and treatment outcomes that are comparable—or even superior—to those reported by mainstream health facilities. The use of peer support groups, well-trained and supportive health workers, short message service (SMS) reminders and reduced waiting times at clinics also have proven successful for increasing retention among adolescents and young people living with HIV.

Viral load testing, which was rarely available in low- and middle-income countries just a few years ago, is rapidly expanding. Nearly half of all people on treatment in countries that reported data to UNAIDS in 2016 receive a routine viral load test, improving the monitoring of treatment outcomes and informing a timely switch to second-line and third-line therapy, when needed. Point-of-care technologies offer further potential to expand viral load testing to everyone accessing treatment and to achieve more precise monitoring of both individual and community viral loads.

## SEARCH: ACHIEVING 90-90-90 AND PROVIDING PRIMARY HEALTH CARE IN RURAL EASTERN AFRICA

SEARCH, a research project working in 32 rural communities in Kenya and Uganda, has demonstrated that rapid gains to reach and exceed the 90-90-90 targets can be achieved at a population level.

In the 16 communities reached by SEARCH services, HIV testing and treatment is situated within a broader health programme that addresses multiple health issues, including cervical cancer, child services (such as deworming), diabetes, hypertension, malaria, voluntary medical male circumcision and tuberculosis. As part of SEARCH's hybrid mobile and home-based testing effort, multidisease health fairs are held in close proximity to where people live, peer educators build demand for services and provide health-related counselling, and streamlined systems enable providers to reach large numbers of community members within a short period of time.

For people who test positive for HIV, SEARCH uses an innovative, client-centred model of HIV treatment delivery that prioritizes efficient service delivery (including colocation of services), a client-friendly environment (with features such as flexible hours), a telephone hotline to answer client questions and help with scheduling appointments, appointment reminders (by phone or SMS) and structured counselling of clients on viral load suppression (2).

### 90-90-90 ACHIEVED IN RURAL EAST AFRICA

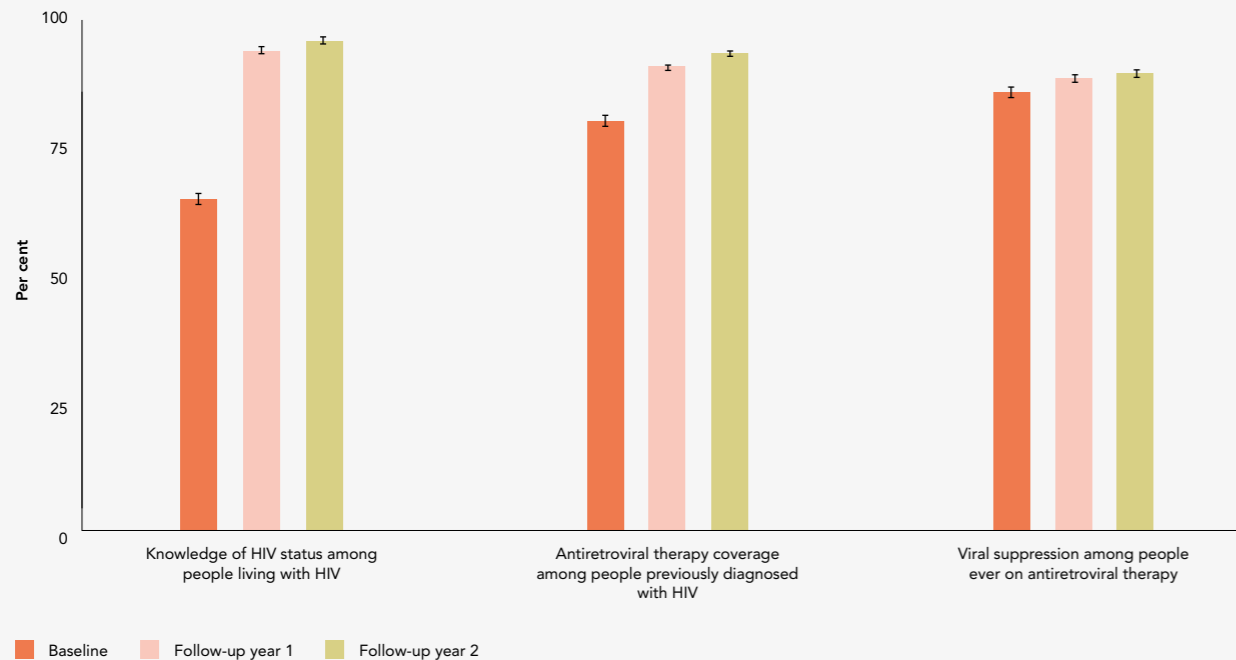


FIGURE 1.2. PROGRESS TOWARDS THE 90-90-90 TARGETS, ALL AGES, 16 COMMUNITIES IN RURAL KENYA AND UGANDA

Source: Petersen M, Balzer L, Kwarisima D, Sang N, Chamie G, Ayieko J et al. Association of implementation of a universal testing and treatment intervention with HIV diagnosis, receipt of antiretroviral therapy, and viral suppression in East Africa. JAMA. 2017;317(21):2196-2206.

In just two years of service delivery, the 90-90-90 targets have been reached in the communities served by SEARCH (Figure 1.2). Knowledge of HIV status among people living with HIV was an estimated 96% [95-97%], antiretroviral therapy coverage among people previously diagnosed with HIV was 93% [93-94%] and 90% [89-90%] of people on treatment had achieved viral suppression (3). Overall gains were remarkable: viral suppression among people living with HIV at baseline was 45% [44-46%], but after two years of service delivery, it had increased to 80%—well beyond the 73% required for full achievement of 90-90-90 targets (3).

Especially noteworthy were the results achieved across the cascade for men and young people, populations that have been historically difficult to reach with HIV testing and treatment services (Figure 1.3). Among men, the first two 90s were achieved and 88% of those accessing treatment had suppressed viral loads; the level of viral suppression among all men living with HIV in the study area also increased, nearly doubling from 39% at baseline to 76% (3). Although results among young people (aged 15-24 years) did not quite reach the 90-90-90 targets, the health outcomes for young people living with HIV were remarkably improved, and the chance of onward transmission of the virus was sharply reduced: while only 26% of young people living with HIV were virally suppressed at the baseline, that had risen to 65% after two years (3).

### REACHING MEN AND YOUNG PEOPLE

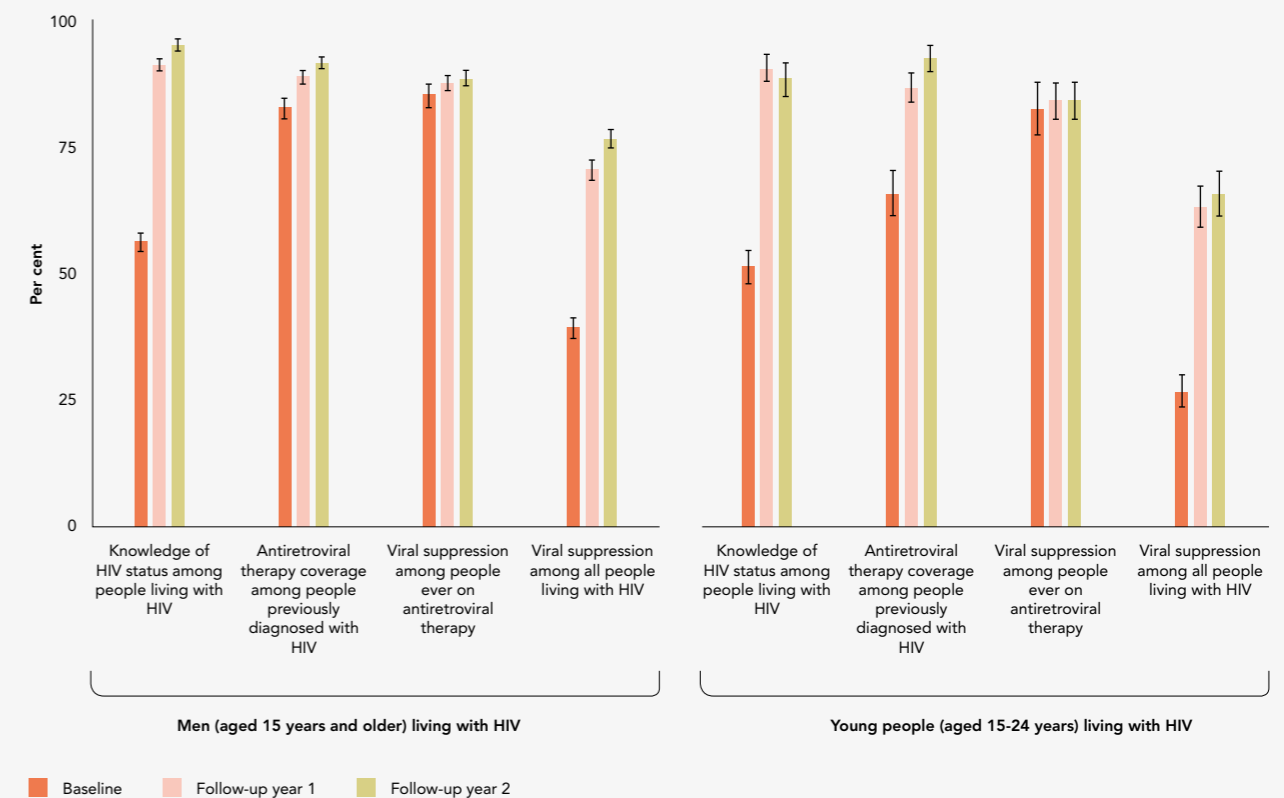


FIGURE 1.3 PROGRESS TOWARDS THE 90-90-90 TARGETS, MEN (AGED 15 YEARS AND OLDER) AND YOUNG PEOPLE (AGED 15-24 YEARS), 16 COMMUNITIES IN RURAL UGANDA AND KENYA

Source: Petersen M, Balzer L, Kwarisima D, Sang N, Chamie G, Ayieko J et al. Association of implementation of a universal testing and treatment intervention with HIV diagnosis, receipt of antiretroviral therapy, and viral suppression in East Africa. JAMA. 2017;317(21):2196-2206.

## BARRIERS TO SUCCESS

Within this clear-cut picture of progress lurk troubling barriers to success. Although the gaps across the cascade have narrowed, when combined, they translate to 44% [32–53%] of all people living with HIV being virally suppressed in 2016—substantially lower than the 73% required for full achievement of the 90–90–90 targets. The percentage of patients with advanced disease at treatment enrolment (CD4+ T-cell count under 200 cells/mm<sup>3</sup>) remains alarmingly high in many countries: among the 85 countries that reported data to UNAIDS in 2016, under a third of people diagnosed with HIV had a CD4 T-cell count of less than 200. These data reinforce the continued importance of a combination approach to HIV prevention that is delivered at scale.

Data from a variety of sources show that that gaps in the 90–90–90 continuum are greater for men, young people and key populations. Harmful masculine gender norms contribute to greater risk-taking and poorer uptake of health services among men. Consent laws and insufficient access to comprehensive sexuality education deny young people the services and knowledge they need. Key populations often face criminalization and high levels of stigma and discrimination. Closing gaps in service coverage requires intensified efforts to convince men to reject harmful versions of masculinity, and to reach and empower women and girls, young people and key populations, to enhance their agency and to ensure their human rights are respected and protected. Addressing stigma, discrimination and human rights violations at all levels through the creation of a protective and empowering legal environment and strong rule of law is an imperative for both the AIDS response and the wider 2030 Agenda for Sustainable Development.

### RESOURCE AVAILABILITY IN DANGER OF FALLING SHORT OF GLOBAL COMMITMENTS

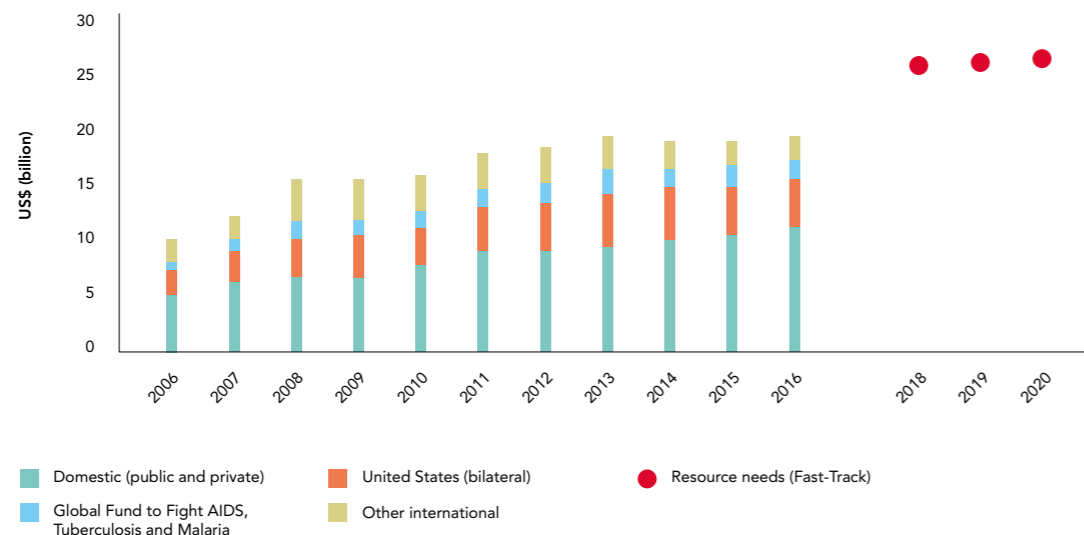


FIGURE 1.4. HIV RESOURCE AVAILABILITY BY SOURCE, 2006–2016, AND PROJECTED RESOURCE NEEDS BY 2020, LOW- AND MIDDLE-INCOME COUNTRIES\*

Source: UNAIDS estimates June 2017 on HIV resource availability. Fast-Track update on investments needed in the AIDS response, 2016–2030. Geneva: UNAIDS; 2016. Financing the response to low- and middle-income countries: international assistance from Donor Governments in 2016. The Henry J. Kaiser Family Foundation and UNAIDS (in press). GAM/GARPR reports (2005–2017). Philanthropic support to address HIV/AIDS in 2015. Washington, DC: Funders Concerned about AIDS; 2016.

\*Estimates for low- and middle-income countries per 2015 World Bank income level classification. All figures are expressed in constant 2016 US dollars.

Funding is an additional concern. Trends in resource availability for AIDS responses in low- and middle-income countries remained flat for the third consecutive year, at about US\$ 19.1 billion. International investment in the AIDS responses of these countries peaked in 2013 at nearly US\$ 10 billion (constant 2016 US dollars); it has since declined to around US \$8.1 billion in 2016. Meanwhile, although domestic investments increased by an average of 11% a year from 2006 to 2016, the rate of that increase slowed to 5% between 2015 and 2016 (Figure 1.4).

This overall stable trend in resource availability is at odds with the resource commitments agreed by the United Nations General Assembly: US\$ 26 billion in low- and middle-income countries by 2020. Building on the unprecedented international assistance made by PEPFAR and through the Global Fund to Fight AIDS, Tuberculosis and Malaria, additional domestic and donor investment is needed to achieve the 90–90–90 targets and the other Fast-Track Targets for 2020 within the 2016 United Nations Political Declaration on Ending AIDS.

## GLOBAL SUCCESS IS WITHIN REACH

For more than 35 years, the world has grappled with an AIDS epidemic that has claimed an estimated 35.0 million [28.9 million–41.5 million] lives and at its peak threatened global stability and security (4). Today the United Nations General Assembly has a shared vision to consign AIDS to the history books and a Fast-Track strategy to achieve that goal.

A plan for a world without an AIDS epidemic, however, is not enough to make this vision a reality. The world must act, using the passion and commitment that have proven so potent in the past to make the required investments in the technologies and service delivery strategies that we know can close gaps towards each of the targets in the 2016 Political Declaration on Ending AIDS.

*Countries, cities and large-scale research projects across the world are proving that the 90–90–90 targets can be achieved globally.*

At the mid-point between the launch of the 90–90–90 targets and their 2020 deadline, incredible progress has been achieved. High-income cities across the world and large-scale projects in rural and urban settings in eastern and southern Africa are proving that challenges can be overcome and that the targets can be achieved globally. Their successes are built upon a foundation laid in the earliest days of the epidemic, when communities vigorously confronted denial and inaction to put into motion what would become known as the AIDS response. To reach the 90–90–90

targets, communities will again need to be at the centre of the response—in this case, by delivering testing and treatment services, by continuing to innovate and by holding stakeholders accountable for results. Only a genuine partnership—combining the energy, know-how and commitment of communities, governments, health-care providers, private industry and other vital stakeholders—will enable the world to reach a major milestone on the road to our ultimate destination of a world without an AIDS epidemic.



# FAST-TRACK CITIES



19 municipalities have signed in Cameroon  
 34 municipalities have signed in Côte d'Ivoire  
 17 municipalities have signed in Honduras  
 3 municipalities have signed in Panama  
 15 municipalities have signed in Senegal  
 12 municipalities have signed in South Africa  
 2 municipalities have signed in Togo  
 51 municipalities have signed in Zambia  
 9 municipalities have signed in Spain  
 15 municipalities have signed in Sierra Leone  
 31 municipalities have signed in Brazil

FIGURE 1.5. CITIES AND MUNICIPALITIES THAT HAVE SIGNED ON TO THE 2014 PARIS DECLARATION ON ENDING THE AIDS EPIDEMIC, 2017

Source: UNAIDS, 2017.

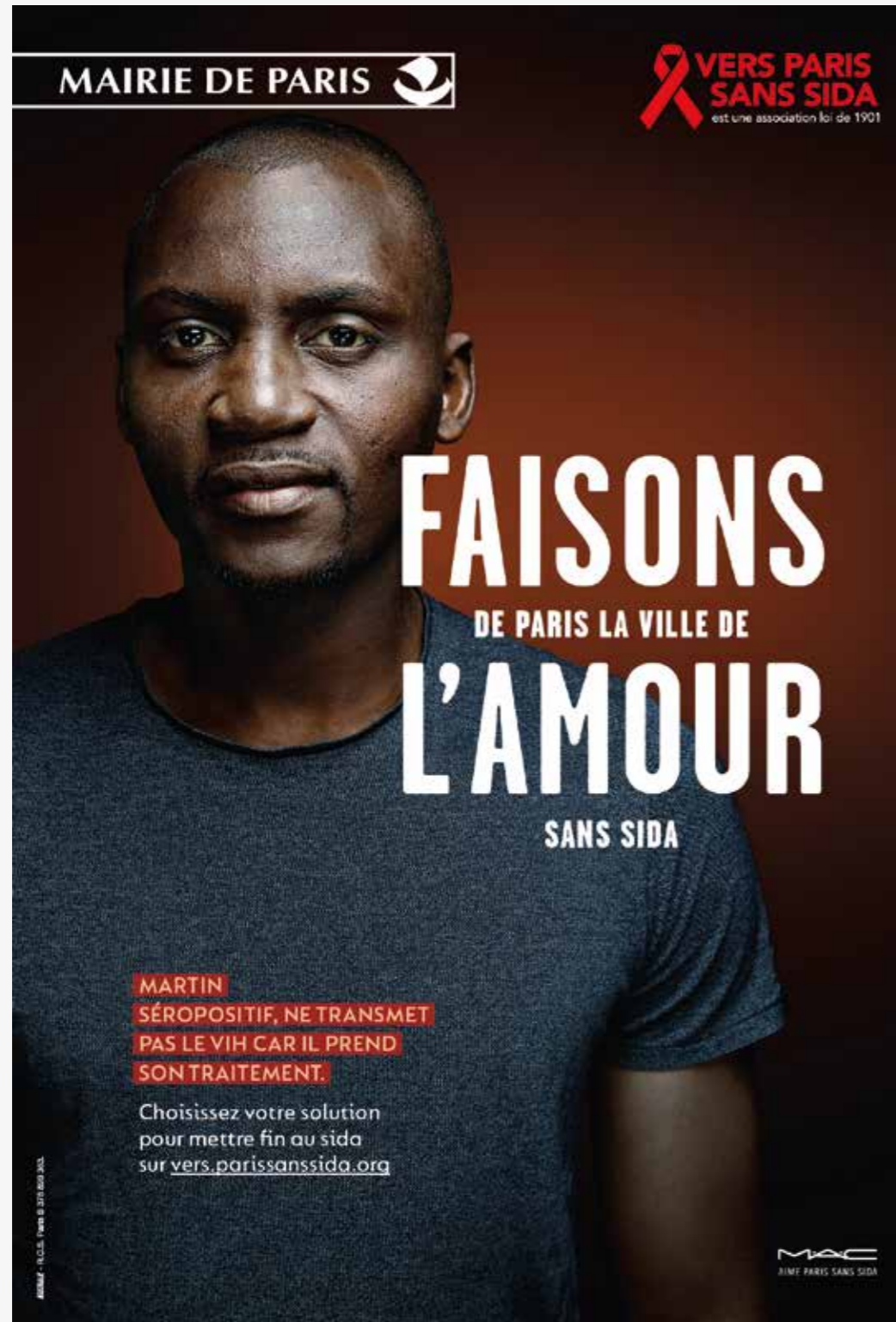
Cities are home to more than half of the world's population and a large and growing proportion of people living with HIV, tuberculosis (TB) and other diseases (1). The risk of HIV and TB infection is often higher in urban compared to rural areas because of dynamics such as social networking, migration and socioeconomic inequalities. Cities also serve as hubs of innovation, community involvement and strong local leadership—all of which are inherent advantages in accelerating health responses.

At a historic meeting in Paris on World AIDS Day, 1 December 2014, UNAIDS, the City of Paris, the International Association of Providers of AIDS Care (IAPAC) and UN-Habitat joined 26 key cities from around the world to launch the 2014 Paris Declaration on ending the AIDS epidemic. To date, more than 200 cities and municipalities have signed the declaration, pledging their commitment to attaining the 90–90–90 targets by 2020, to addressing disparities in access to basic health and social services, social justice and economic opportunities, and to ending AIDS as a public health threat by 2030 (Figure 1.5).

Significant progress has been made, with at least two cities—Amsterdam and Melbourne—attaining the 90–90–90 targets, and others closing in on the targets.<sup>1</sup> Mayors such as Anne Hidalgo of Paris are playing key leadership roles. The engagement of communities—including people living with HIV and their clinical and service providers—in decision-making processes has been critical to refocusing city AIDS plans. Strategic use of data has improved prioritization of resources and programmes to address gaps across the HIV care continuum. With support from UNAIDS, IAPAC and other partners, cities are adopting innovative approaches to reach and diagnose hard-to-reach populations, to optimize linkages to care and antiretroviral therapy initiation, and to support people living with HIV to suppress their viral loads.

While progress has been achieved in many cities, much more remains to be done. Stigma and discrimination, including in health-care settings, need to be addressed to break down barriers to accessing and utilizing HIV services, especially among key and vulnerable populations. Best practices and lessons learned by Fast-Track cities must be leveraged to inspire and encourage the many other cities facing similar challenges in their local AIDS responses. Case studies in this report highlight progress achieved in cities worldwide.

<sup>1</sup> See the Fast-Track Cities Global Web Portal (available at <http://www.fast-track-cities.org/>).



Paris has been edging closer to the 90–90–90 targets: according to the latest available data, more than 90% of people diagnosed with HIV have been linked to care under the national “treat all” approach, and 94% of people on treatment for more than six months have suppressed viral loads. A key gap is late diagnosis of HIV infection and the persistence of an ongoing hidden epidemic among the estimated 16% of people living with HIV who do not know their status. The city’s epidemic is concentrated in specific districts and among two populations: migrants from sub-Saharan Africa and gay men and other men who have sex with men account for 90% of new HIV diagnoses in Paris (5).

National guidelines updated in February 2017 call for quarterly repeat HIV testing among gay men and other men who have sex with men, and annual repeat testing among migrants. Wide and diverse use of community-based testing approaches, including mobile testing programmes and walk-in centres, is recommended. HIV self-testing has been available in France since September 2015, and PrEP has been available and reimbursed by the national public health insurance since January 2016. Implementation of this national framework is required at city- and community-level to close the remaining gaps in the cascade.

The city’s AIDS response strategy, adopted by Paris City Council in May 2016, focusses on reaching out to key populations, on promoting a combination prevention approach and on publicizing the preventative effects of antiretroviral therapy. Outreach efforts, including a broad communication campaign (Figure X.X), have helped to double the number of people screened for HIV using rapid HIV tests in neighbourhoods with large populations of migrants from sub-Saharan Africa. City authorities have also contributed to scale up the offer of PrEP and full HIV and sexually transmitted infection screening every three months to gay men and other men who have sex with men, by supporting gay-friendly sexual health clinics and promoting evening and weekend consultations to boost uptake of this powerful preventive tool. Price negotiation at city level has stimulated a 50% increase in the number of free HIV self-testing kits delivered by local community actors.

The constant assessment of progress and the rapid adoption of new, proven tools and methods look certain to place Paris among the first Fast-Track cities to surpass the 90–90–90 targets.

*Information for this case study was provided to UNAIDS by the Fast-Track Paris team, Mairie de Paris, on 12 July 2017.*



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## 2. STATE OF THE EPIDEMIC

### AIDS-RELATED DEATHS CONTINUE TO DECLINE

Global scale-up of antiretroviral therapy has been the primary contributor to a 48% decline in deaths from AIDS-related causes, from a peak of 1.9 million [1.7 million–2.2 million] in 2005 to 1.0 million [830 000–1.2 million] in 2016 (Figure 2.1). Despite the fact that 51% of people living with HIV globally are female, higher treatment coverage and better adherence to treatment among women have driven more rapid declines in AIDS-related deaths among females: deaths from AIDS-related illnesses were 27% lower among women and girls in 2016 than they were among men and boys (Figure 2.2). Nonetheless, AIDS-related illnesses remain the leading cause of death among women of reproductive age (15–49 years) globally, and they are the second leading cause of death for young women aged 15–24 years in Africa (1).

#### DECLINE IN DEATHS MORE RAPID AMONG WOMEN

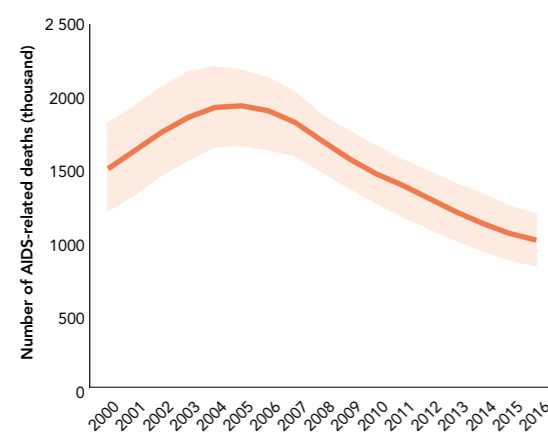


FIGURE 2.1. AIDS-RELATED DEATHS, ALL AGES, GLOBAL, 2000–2016

Source: UNAIDS 2017 estimates.

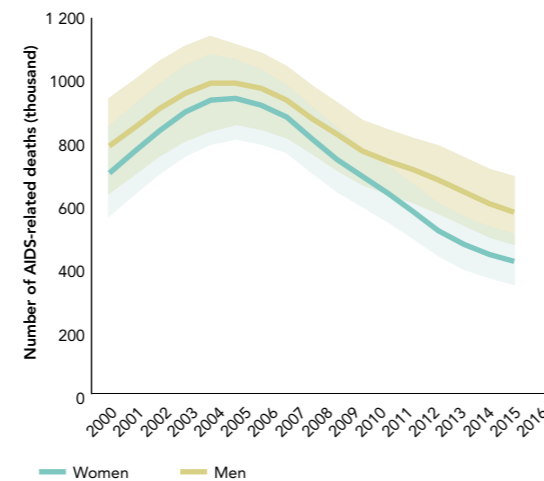


FIGURE 2.2. AIDS-RELATED DEATHS BY SEX, ALL AGES, GLOBAL, 2000–2016

Source: UNAIDS 2017 estimates.

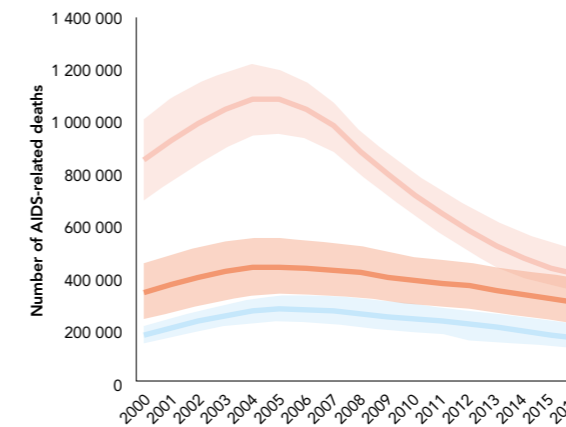
The number of children (aged 0–14 years) dying of AIDS-related illnesses has been nearly cut in half in just six years, from 210 000 [160 000–260 000] in 2010 to 120 000 [79 000–160 000] in 2016. Much of the decline is due to steep reductions in new HIV infections among children, with increased access to paediatric antiretroviral therapy also playing an important role.

**Acceleration of the AIDS response has reduced AIDS-related deaths by 32% and new HIV infections by 16% globally between 2010 and 2016.**

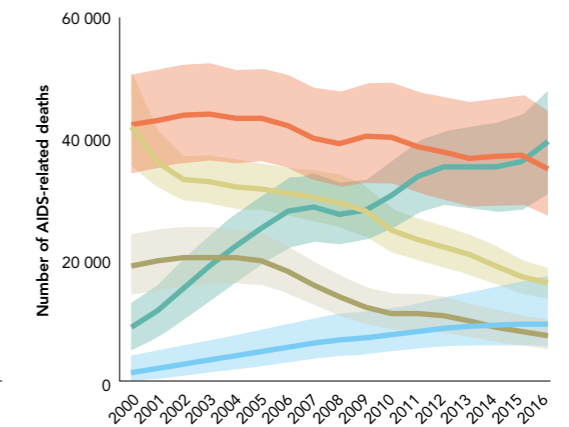
Declines in deaths from AIDS-related illnesses were sharpest in eastern and southern Africa, where they peaked at 1.1 million [950 000–1.2 million] in 2004 and then plummeted by 62% to 420 000 [350 000–510 000] in 2016, a trend that reflected the rapid scale-up of antiretroviral therapy in the region. Declines in AIDS-related deaths were also achieved over the last decade in the Caribbean (52% reduction), western and central Europe and North America (45% reduction), Asia and the Pacific (39% reduction) and western and central Africa (30% reduction) (Figure 2.3). In Latin

America, where antiretroviral therapy scale-up occurred earlier and more gradually than in most other regions, the decline in deaths over the past 10 years was just 16%. Worrying increases in AIDS-related mortality have occurred over the past decade in the Middle East and North Africa (48% increase) and eastern Europe and central Asia (38% increase).

#### DECLINE IN DEATHS SHARPEST IN EASTERN AND SOUTHERN AFRICA



Eastern and southern Africa  
Western and central Africa  
Asia and the Pacific



Eastern Europe and central Asia  
Western and central Europe and North America  
Caribbean  
Latin America  
Middle East and North Africa

FIGURE 2.3. AIDS-RELATED DEATHS, BY REGION, 2000–2016

Source: UNAIDS 2017 estimates.

## NEW HIV INFECTIONS ARE DECLINING, BUT ARE FAR OFF THE PACE NEEDED TO REACH THE 2020 TARGET

Global efforts to strengthen HIV prevention and treatment programmes are also reducing the transmission of HIV. Since 2010, the annual number of new HIV infections (all ages) has declined by 16% to 1.8 million [1.6 million–2.1 million]. The pace of decline in new HIV infections, however, is far too slow to reach the Fast-Track Target agreed upon by the United Nations General Assembly in 2016: fewer than 500 000 new infections per year by 2020 (Figure 2.4).

The pace of decline varied by age group and between men and women. Among children, new infections have declined 47% since 2010, while coverage of antiretroviral medicines provided to pregnant women living with HIV to prevent transmission to their children rose from 47% [38–55%] to 76% [60–88%] over the same period (Figure 2.5).

Differences in the number of new HIV infections between men and women are more pronounced at younger ages: in 2016, new infections among young women (aged 15–24 years) were 44% higher than they were among men in the same age group. Since 2010, new infections among young women globally (aged 15–24 years) have declined by 17%, reaching 360 000 [210 000–470 000] in 2016. New infections also declined among young men (aged 15–24 years) during that time, falling by 16% to 250 000 [110 000–320 000] in 2016 (Figure 2.6).

### REDUCTIONS IN NEW INFECTIONS ARE OFF TARGET

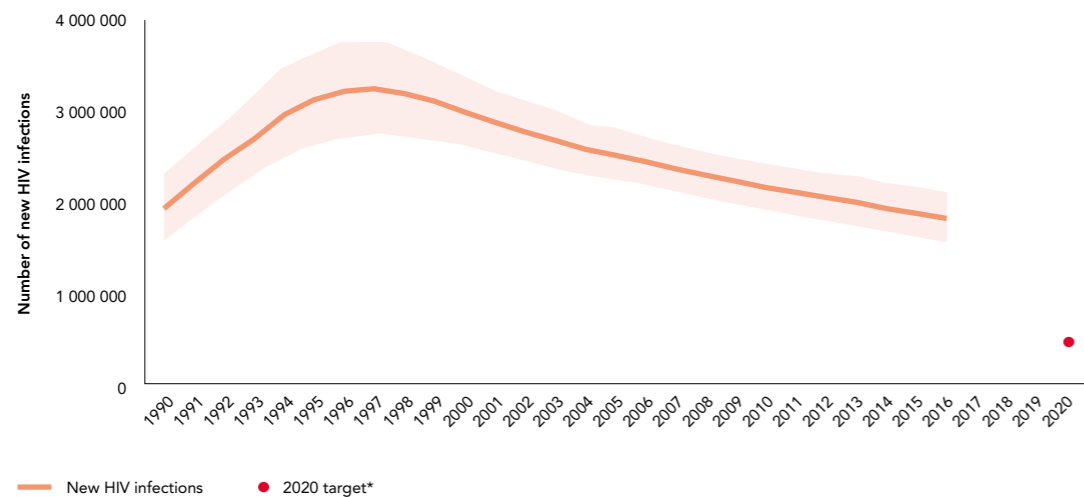


FIGURE 2.4. NEW HIV INFECTIONS, ALL AGES, GLOBAL, 1990–2016 AND 2020 TARGET

Source: UNAIDS 2017 estimates.

\*The 2020 target is fewer than 500 000 new HIV infections, equivalent to a 75% reduction since 2010.

### DECLINES IN NEW INFECTIONS VARY BY AGE AND SEX

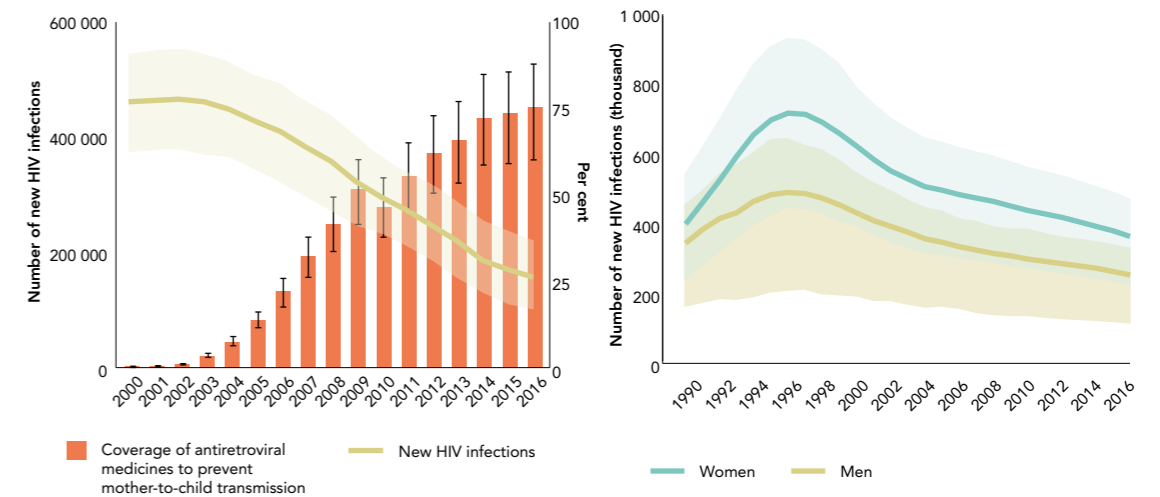


FIGURE 2.5. NEW HIV INFECTIONS AMONG CHILDREN (AGED 0–14 YEARS) AND COVERAGE OF ANTIRETROVIRAL REGIMENS TO PREVENT MOTHER-TO-CHILD TRANSMISSION, GLOBAL, 2000–2016

Source: UNAIDS 2017 estimates.

FIGURE 2.6. NEW HIV INFECTIONS, YOUNG PEOPLE (AGED 15–24 YEARS), BY SEX, GLOBAL, 1990–2016

Source: UNAIDS 2017 estimates.

### ALARMING RISE IN NEW INFECTIONS IN EASTERN EUROPE AND CENTRAL ASIA

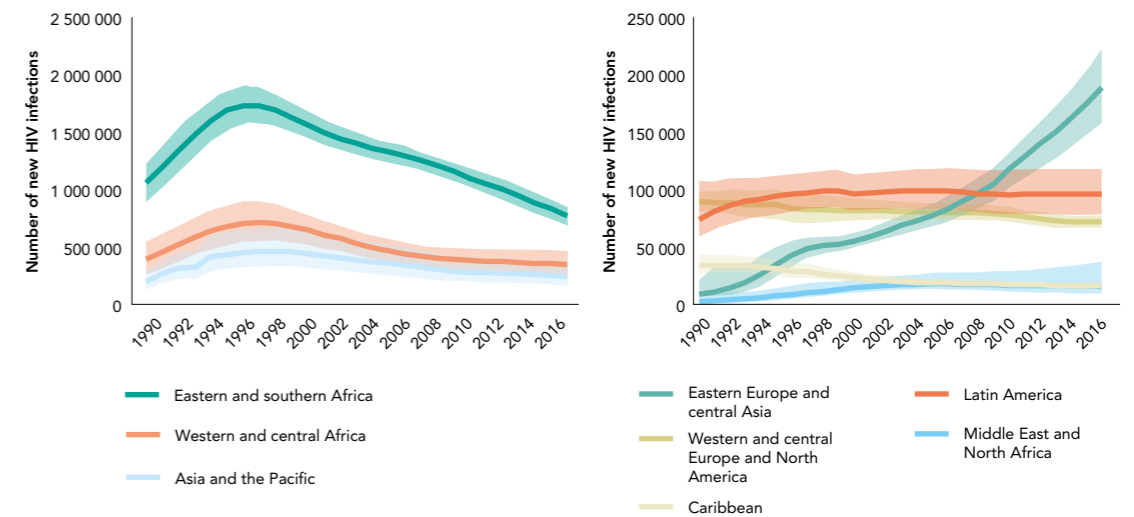


FIGURE 2.7. NEW HIV INFECTIONS, ALL AGES, BY REGION, 1990–2016

Source: UNAIDS 2017 estimates.

Regional trends in the annual number of new HIV infections (all ages) also varied (Figure 2.7). The steepest declines between 2010 and 2016 were achieved in eastern and southern Africa (29% decline), followed by Asia and the Pacific (13% decline), western and central Africa (9% decline), western and central Europe and North America (9% decline), the Caribbean (5% decline), and the Middle East and North Africa (4% decline). Trends over the same time period in Latin America were stable, and in eastern Europe and central Asia, the annual number of new infections climbed by an alarming 60%.

## CHANGES IN ESTIMATED TRENDS IN NEW HIV INFECTIONS AMONG ADULTS

In 2016, UNAIDS reported that the trend in new HIV infections among adults (aged 15 years and older) had remained static between 2010 and 2015 at 1.9 million new infections per year [2015 range of 1.7 million–2.2 million] (2). In 2017, however, UNAIDS estimates show a slightly different trend: new adult infections are estimated to have declined by 8% between 2010 and 2015, and by 11% between 2010 and 2016.

Most of the difference in the two sets of global estimates is driven by changes in country estimates in eastern and southern Africa, where UNAIDS had previously estimated a 4% decrease in new HIV infections among adults between 2010 and 2015. The 2017 estimate, however, is an 18% decrease among adults over the same period.

The change in trends, both globally and in eastern and southern Africa, is due primarily to the availability of new data. The trend data previously included in the model were mostly from HIV sentinel surveillance sites at antenatal clinics. Several years ago, however, a number of countries stopped conducting antenatal clinic sentinel surveillance. This resulted in limited availability of data between 2012 and 2015 to inform the estimates of a number of high-prevalence countries.

In 2017, countries were able to include in their estimates routine HIV prevalence data from all pregnant women who attend antenatal clinics. The move to using routine data is an important shift, because it is more sustainable and more able to provide data on a timely and more granular basis. The data suggest there was a greater decline in new HIV infections in a number of countries (e.g. Mozambique, Swaziland and Uganda). In addition, data from the Public Health Impact Assessment surveys in Malawi, Zambia and Zimbabwe contributed to the improved new infection estimates.

Every year, UNAIDS supports countries to produce a complete time series of all epidemiological indicators using updated modelling software. Comparisons over time should always be done using a time series from the same model.

## POPULATIONS AT HIGHER RISK OF INFECTION

In high-prevalence settings, young women remain at unacceptably high risk of HIV infection. In eastern and southern Africa, for example, young women (aged 15–24 years) accounted for 26% of new HIV infections in 2016 despite making up just 10% of the population. Young women (aged 15–24 years) in western and central Africa and the Caribbean respectively accounted for 22% and 17% of new HIV infections in 2016.

In lower prevalence settings, the majority of HIV infections occur among key populations—people who inject drugs, sex workers, transgender people, prisoners, and gay men and other men who have sex with men—and their sexual partners. Outside of sub-Saharan Africa, key populations and their sexual partners accounted for 80% of new HIV infections in 2015 (Figure 2.8). Even in sub-Saharan Africa, key populations and their sexual partners are an important part of the HIV epidemic: in 2015, 25% of new infections occurred among this group, underlining the importance of reaching them with services.

Globally, gay men and other men who have sex with men accounted for 12% of new infections in 2015, while sex workers and people who inject drugs accounted for 5% and 8% of new infections, respectively. Furthermore, data reported by countries across the world show that HIV prevalence among key populations often is substantially higher than it is among the general population (Figure 2.9).

### KEY POPULATIONS ARE IMPORTANT IN ALL EPIDEMIC SETTINGS

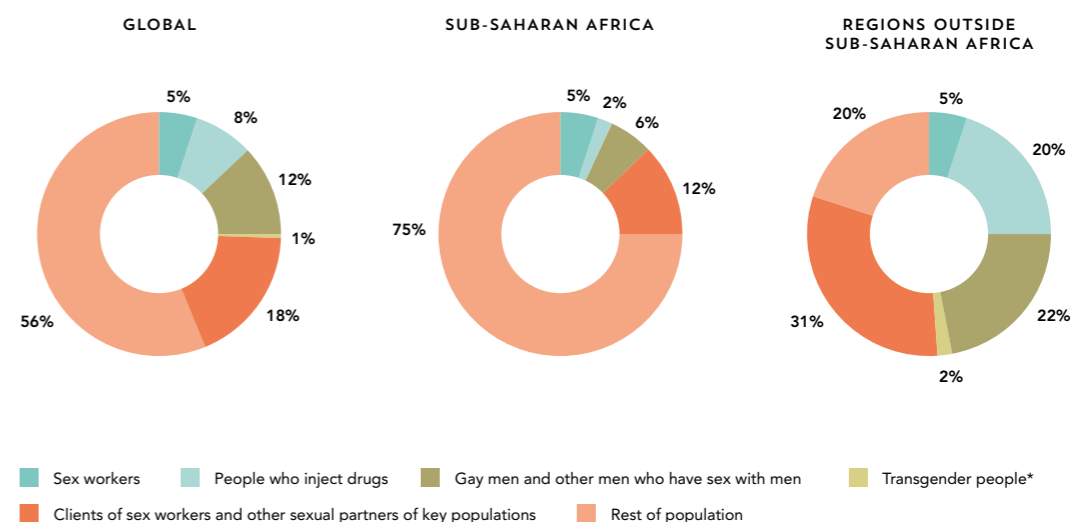


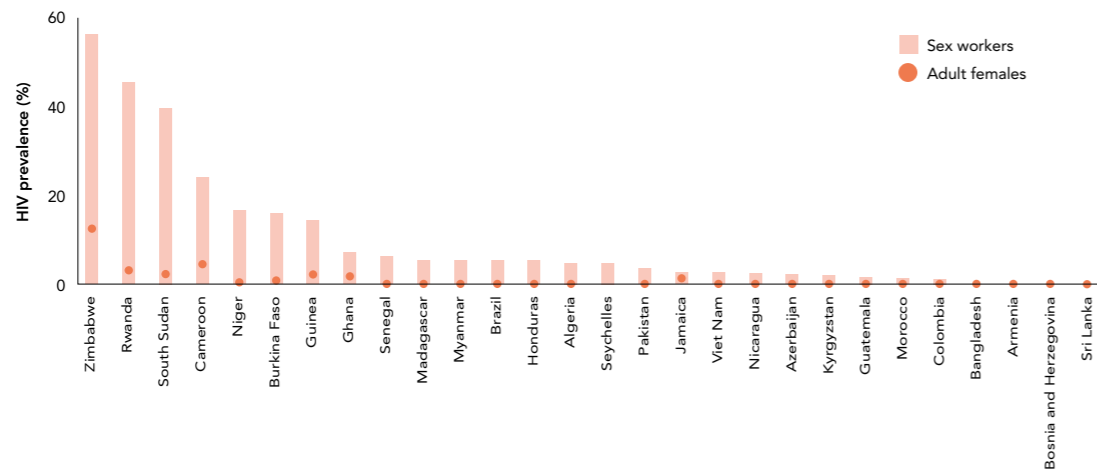
FIGURE 2.8. DISTRIBUTION OF NEW HIV INFECTIONS, BY POPULATION, GLOBAL, SUB-SAHARAN AFRICA AND COUNTRIES OUTSIDE OF SUB-SAHARAN AFRICA, 2015

Source: UNAIDS special analysis, 2017.

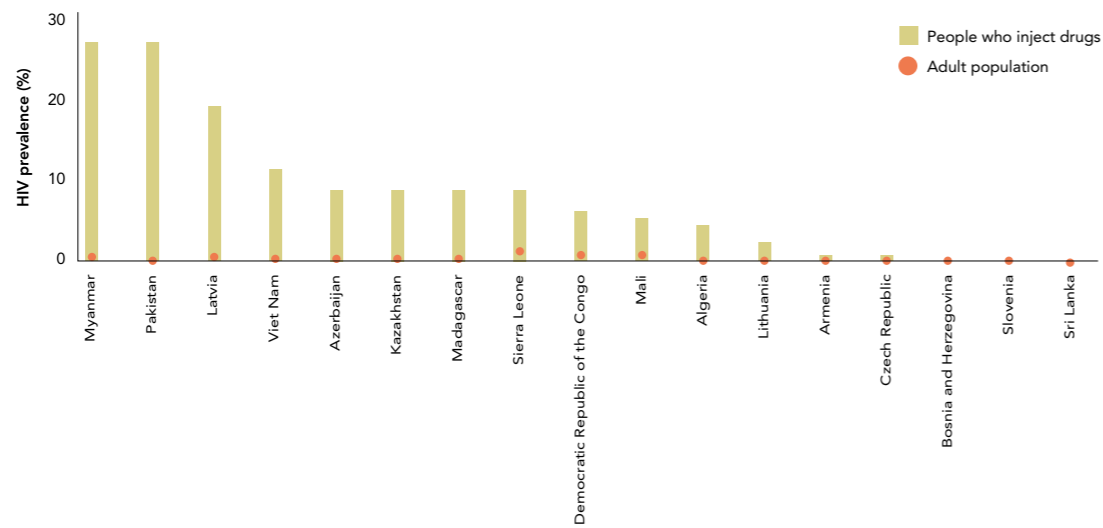
\*Only reflects Asia and the Pacific, Latin America and Caribbean regions.

HIGH HIV PREVALENCE AMONG KEY POPULATIONS

Female sex workers and the adult female population



People who inject drugs and the adult population



Gay men and other men who have sex with men and the adult male population

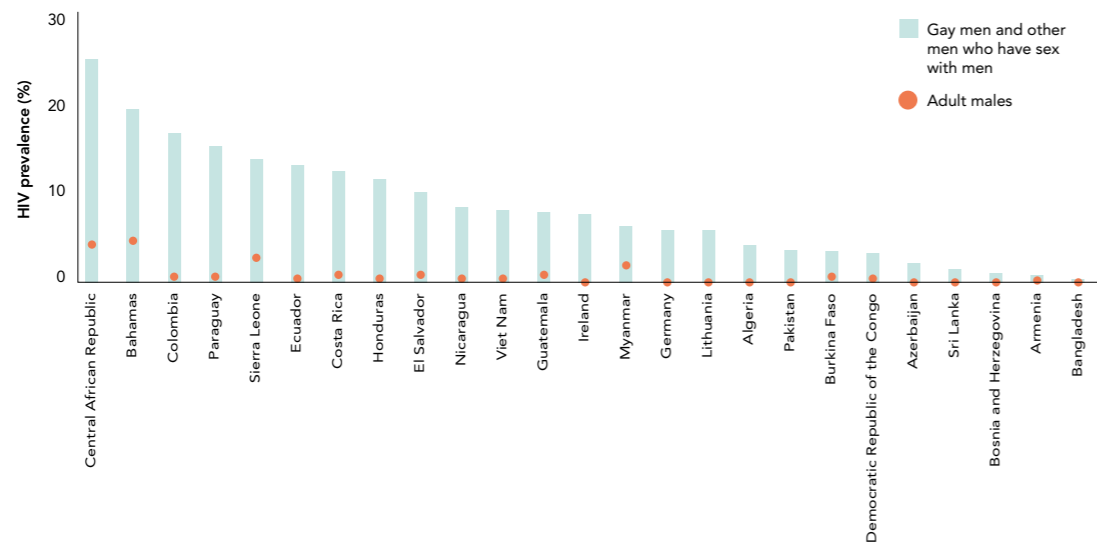


FIGURE 2.9. HIV PREVALENCE AMONG KEY POPULATIONS AND GENERAL POPULATION, SELECT COUNTRIES, 2014–2016

Source: UNAIDS 2017 estimates. Global AIDS Monitoring, 2017.

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1. Global health estimates 2015: deaths by cause, age, sex, by country and by region, 2000–2015. Geneva: World Health Organization; 2016.
2. Prevention gap report. Geneva: UNAIDS; 2016.

# 3. MIDTERM PROGRESS TOWARDS 90-90-90

## CLOSING IN ON A FAST-TRACK TARGET



FIGURE 3.1. PROGRESS TOWARDS THE 90-90-90 TARGETS, GLOBAL, 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

Remarkable progress has been made towards achieving the 90-90-90 targets. More than two thirds of all people living with HIV—an estimated 70% [51-84%]—knew their HIV status in 2016. Among those who knew their HIV status, 77% [57- >89%] were accessing antiretroviral therapy, and 82% [60- >89%] of people accessing treatment had suppressed viral loads. Individual countries, cities and communities in a diversity of settings have already achieved the 90-90-90 targets, proving that global attainment of all three 90s by 2020 is both feasible and reachable if gaps across the HIV testing and treatment cascade are aggressively addressed.

## ACHIEVING THE 90-90-90 TARGETS, 2016

	FIRST 90	SECOND 90	THIRD 90	VIRAL LOAD SUPPRESSION AMONG ALL PEOPLE LIVING WITH HIV	
<b>Achieved (90% or greater)</b>	Australia Belarus Denmark Ecuador Malaysia Sweden Thailand	Australia Algeria Botswana Cambodia Comoros Denmark France Haiti Ireland Malawi Malta	Mongolia Niger Portugal Rwanda Spain Sweden Switzerland Uganda United Kingdom Zambia Zimbabwe	Botswana Brazil Belgium Cambodia Chile Comoros Czechia Denmark France Germany Hungary Iceland Kuwait <sup>3</sup>	<b>Achieved (73% or greater)</b> Botswana Cambodia Denmark Iceland Singapore Sweden United Kingdom
<b>Nearly achieved (85-89%)</b>	Austria Botswana Cuba Fiji Germany Hungary Ireland Italy Lithuania Luxembourg Netherlands Nicaragua Rwanda Romania South Africa United Kingdom	Austria Ethiopia Gambia Italy Luxembourg Mozambique Nigeria Netherlands United Republic of Tanzania	Afghanistan Bulgaria Burundi Canada Ethiopia Georgia Italy Malawi Malta Mongolia Nepal Portugal Spain Swaziland Uruguay Zambia	<b>Nearly achieved (65-72%)</b> Australia Belgium France Germany Italy Kuwait <sup>3</sup> Luxembourg Netherlands Swaziland Spain Switzerland	

FIGURE 3.2. COUNTRIES THAT HAVE ACHIEVED THE 90-90-90 TARGETS OR ARE NEAR TO ACHIEVING THEM, MOST RECENT COUNTRY DATA<sup>1,2</sup>

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

<sup>1</sup> Data are for 2016, except as follows: 2015: Bulgaria, Germany, Hungary, Netherlands, Sweden, Switzerland, United Kingdom. 2014: Belgium, Canada, Serbia, Spain. 2013: Austria, France. 2012: Italy.

<sup>2</sup> Estimates of people living with HIV are supplied by the country and not validated by UNAIDS: Austria, Belgium, Bulgaria, Canada, Denmark, France, Germany, Hungary, Iceland, Italy, Luxembourg, Malta, Netherlands, Portugal, Singapore, Spain, Switzerland, and the United Kingdom

<sup>3</sup> Estimates for citizens of the country only.

## CASCADE PROGRESS VARIES AMONG REGIONS

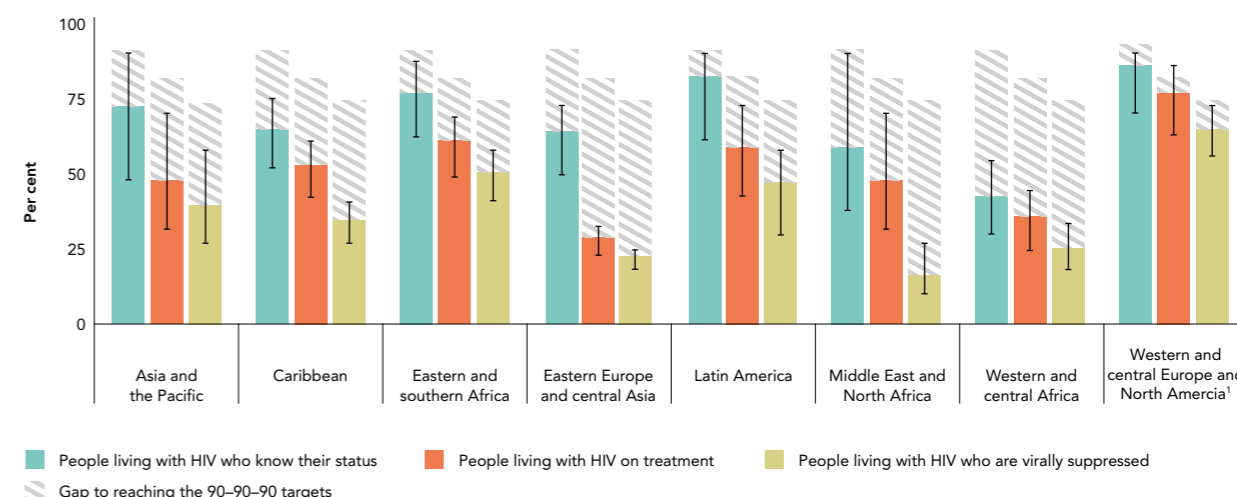


FIGURE 3.3. KNOWLEDGE OF HIV STATUS, TREATMENT COVERAGE AND VIRAL LOAD SUPPRESSION, BY REGION, 2016

Comparison of HIV testing and treatment cascades by region reveals different patterns of progress. Western and central Europe and North America are approaching global targets. Latin America and eastern and southern Africa show high levels of achievement across the cascade. Eastern Europe and central Asia, the Middle East and North Africa, and western and central Africa are clearly off track.

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

<sup>1</sup> Cascade for the western and central Europe and North America region is for 2015.



### THE HIV TESTING AND TREATMENT CASCADE

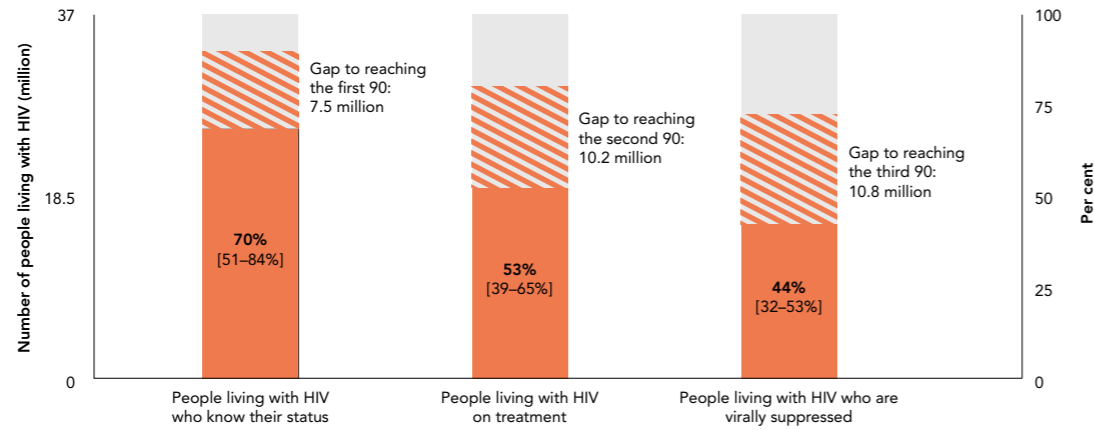


FIGURE 3.4. KNOWLEDGE OF HIV STATUS, TREATMENT COVERAGE AND VIRAL LOAD SUPPRESSION, GLOBAL, 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

### MORE THAN HALF OF ALL PEOPLE LIVING WITH HIV ON TREATMENT

A major milestone was reached in 2016: for the first time, more than half of all people living with HIV (53% [39–65%]) were accessing antiretroviral therapy. More than five in five people on treatment had suppressed viral loads, reflecting high rates of retention across all regions. Data reported by 72 countries show that retention on antiretroviral therapy after 12 months ranged from 72% in western and central Africa to 89% in the Middle East and North Africa (Figure 3.15).

When the gaps across the HIV testing and treatment cascade are combined, however, they translate to 44% [32–53%] of all people living with HIV being virally suppressed in 2016—substantially lower than the 73% required for full achievement of the 90–90–90 targets (Figure 3.4).

### HIGH RETENTION RATES SUPPORT HIGH RATES OF VIRAL SUPPRESSION



FIGURE 3.5. PERCENTAGE OF PEOPLE LIVING WITH HIV RETAINED ON TREATMENT 12 MONTHS AFTER INITIATION, BY REGION, 2016

Source: UNAIDS 2017 estimates. Global AIDS Monitoring, 2017.

### ON TRACK TO 30 MILLION PEOPLE ACCESSING TREATMENT

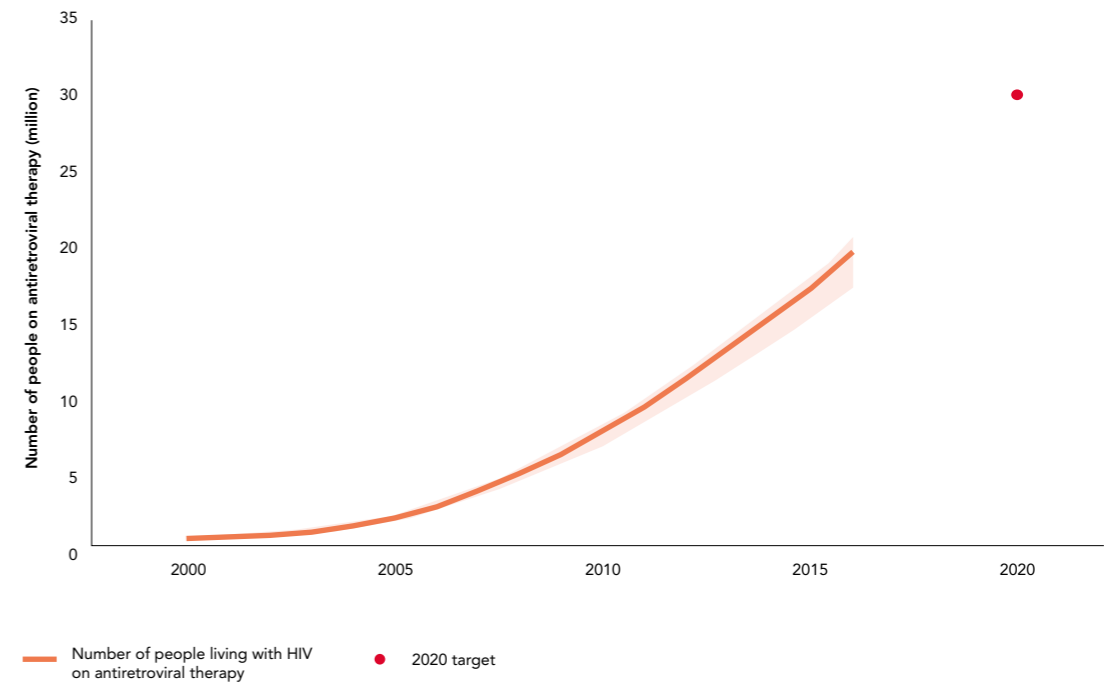


FIGURE 3.6. NUMBER OF PEOPLE LIVING WITH HIV ON ANTIRETROVIRAL THERAPY, GLOBAL, 2000–2016

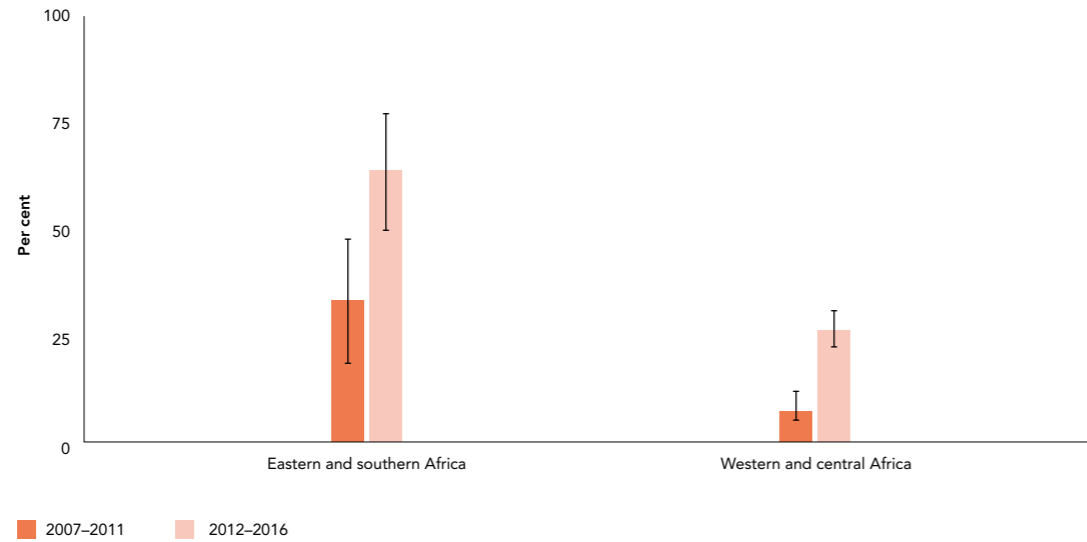
Source: UNAIDS 2017 estimates. Global AIDS Monitoring, 2017.

### GLOBAL CASCADE TRENDS

The number of people accessing antiretroviral therapy in 2016 was 19.5 million [17.2 million–20.3 million], up from 17.1 million [15.1 million–17.8 million] in 2015, an increase in treatment coverage of six percentage points. The additional number of people on treatment each year has increased over time, from 564 000 in 2005 to 1.5 million in 2010 to 2.0 million in 2015 to 2.4 million in 2016. This upward trend has the world on track to achieve the United Nations General Assembly’s target of 30 million people accessing antiretroviral therapy by 2020 (Figure 3.6).

Improving both knowledge of HIV status among people living with HIV and linkages to care after diagnosis will be critical to maintaining the momentum of treatment scale-up. Population-based survey data suggest that knowledge of HIV status has increased markedly over the last decade. In eastern and southern Africa, nearly twice as many adults aged 15–49 years knew their status in 2012–2016 compared to 2007–2011. Although starting from a very low level, gains in western and central Africa were even greater, with a fourfold increase between 2007–2011 and 2012–2016 (Figure 3.7).

**REMARKABLE INCREASE IN KNOWLEDGE OF HIV STATUS OVER THE PAST DECADE**



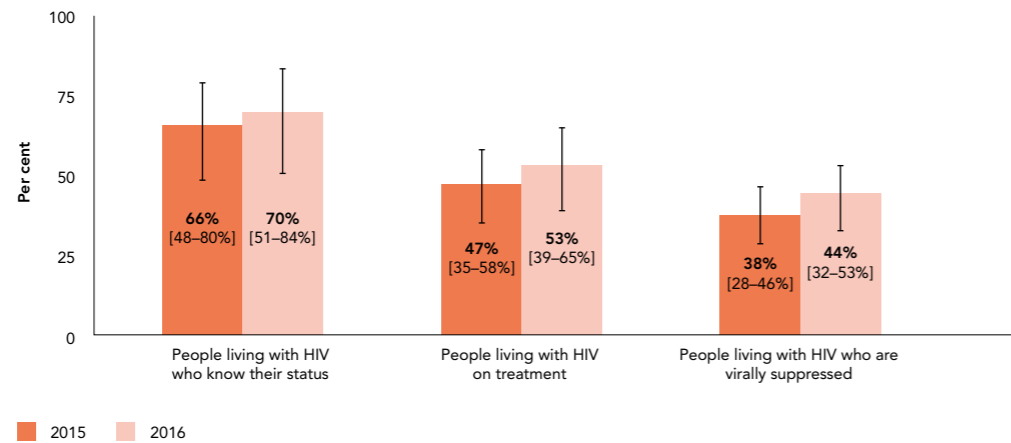
**FIGURE 3.7. KNOWLEDGE OF HIV STATUS AMONG ADULTS AGED 15-49 YEARS, EASTERN AND SOUTHERN AFRICA AND WESTERN AND CENTRAL AFRICA, 2007-2011, COMPARED TO 2012-2016**

Source: UNAIDS special analysis, 2017.

Insufficient annual data on the first and third 90 before 2015 make year-on-year trends difficult to determine. The HIV testing and treatment cascades for 2015 and 2016, however, suggests that progress made in improving knowledge of HIV status—from 66% [48–80%] in 2015 to 70% [51–84%] in 2016—was lower than progress in other areas of the cascade.

By comparison, treatment coverage increased from 47% [35–58%] in 2015 to 53% [39–65%] in 2016, and viral suppression rates increased from 38% [28–46%] in 2015 to 44% [32–53%] in 2016 (Figure 3.18).

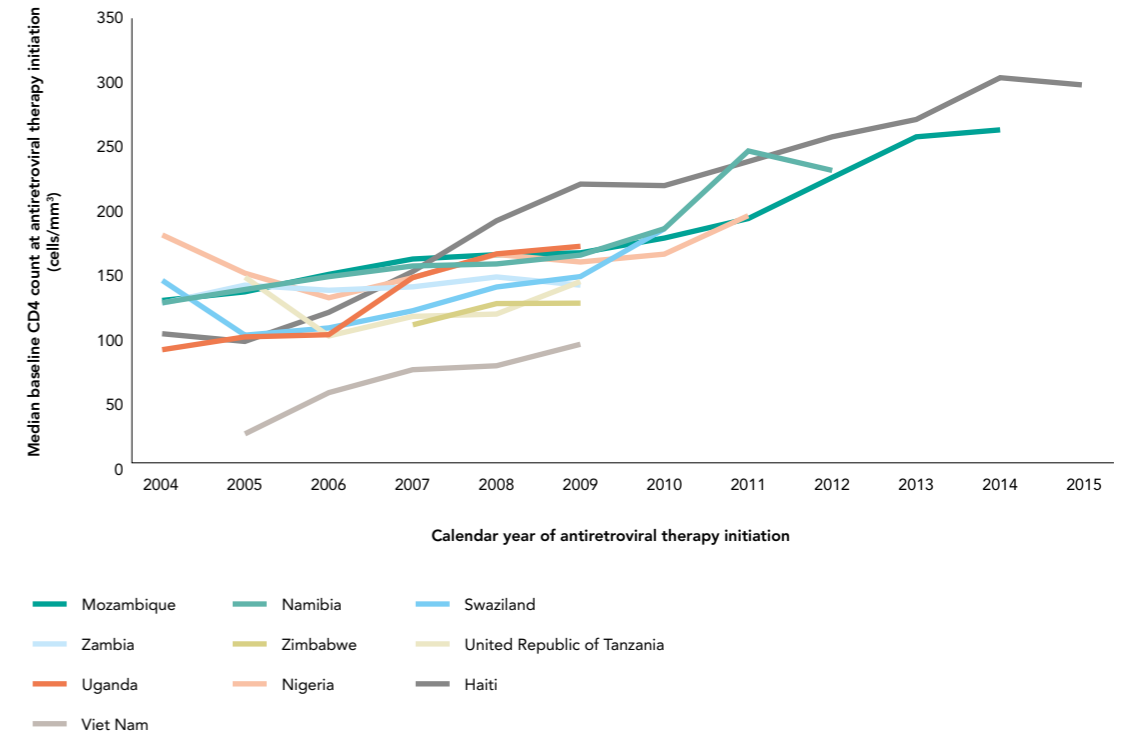
**ONE-YEAR GAINS ACROSS THE CASCADE**



**FIGURE 3.8. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, GLOBAL, 2015 AND 2016**

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

**PEOPLE INITIATING TREATMENT EARLIER, BUT MANY STILL START WITH ADVANCED DISEASE**



**FIGURE 3.9. TRENDS IN MEDIAN CD4 T-CELL COUNT AT ANTIRETROVIRAL THERAPY INITIATION, 10 COUNTRIES, 2004-2015**

Source: Auld AF, Shiraishi RW, Oboho I et al. Trends in Prevalence of Advanced HIV Disease at Antiretroviral Therapy Enrollment—10 Countries, 2004–2015. MMWR Morb Mortal Wkly Rep 2017;66:558–563. doi: <http://dx.doi.org/10.15585/mmwr.mm6621a3>.

**EARLIER TREATMENT INITIATION**

Available data suggest that people are starting treatment earlier. A review of clinical data from 10 countries supported by the United States President’s Emergency Plan for AIDS Relief (PEPFAR) found a clear trend between 2004 and 2015 of increasing CD4+ T-cell count, a marker for immune system strength, among people living with HIV who were initiating antiretroviral therapy (Figure 3.9) (1).<sup>1</sup> The percentage of patients with advanced disease at treatment enrolment (CD4+ T-cell count under 200 cells/mm<sup>3</sup>), however, remains alarmingly high in many countries: among 85 countries that reported data to UNAIDS, 29% of people diagnosed with HIV had a CD4 T-cell count of less than 200. Reporting countries in eastern and southern Africa performed relatively better, with 20% of new diagnoses occurring at an advanced disease, compared to 41% in Asia and the Pacific.

<sup>1</sup> The 10 countries are Haiti, Mozambique, Namibia, Nigeria, Swaziland, Uganda, the United Republic of Tanzania, Viet Nam, Zambia and Zimbabwe.

## EXPANDED ACCESS TO VIRAL LOAD TESTING

Rarely available in low- and middle-income countries until just a few years ago, viral load testing is now rapidly expanding. Forty-five additional countries reported data on viral load testing to UNAIDS in 2016. The total number of people on treatment reported to be accessing viral load testing increased from 4.4 million in 2015 to 8.1 million in 2016. Among the 44 countries that reported data in 2015 and 2016, coverage of viral load testing increased from 49% to 53%.

This expansion is partly the result of South Africa leveraging its market weight to reduce viral load test prices globally. In 2014, the South African government—supported by the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), PEPFAR, UNAIDS and other partners—entered into an agreement with Roche, the maker of a leading platform for viral load testing, for a global maximum per-test price of US\$ 9.40 for the company’s viral load testing technology (2). This favourable price has since been accessed by numerous national markets, including Ethiopia, Kenya, Nigeria, Swaziland, Zambia and Zimbabwe. This expansion of the pricing agreement is projected to achieve US\$ 131 million in savings outside South Africa through 2020 (3).

Despite this progress, country data reported to UNAIDS shows that less than half of people living with HIV on treatment globally receive periodic viral load tests. Coverage of viral load testing is much higher in high-income countries, Latin America and eastern Europe and central Asia, and recent progress in eastern and southern Africa is encouraging. However, available data indicate that the percentage of patients who obtained viral load testing in the Middle East and North Africa remained at about one third, and that in western and central Africa and Asia and the Pacific, less than one in five patients had received an annual test.

## A GROWING NUMBER OF COUNTRIES ON COURSE TO ACHIEVE TARGETS

For much of the history of the AIDS response, high-income countries have provided standards of care that were starkly superior to services available in low- and middle-income countries. The latest data reported to UNAIDS, however, suggest the gap is narrowing, with several low- and middle-income countries within reach of achieving the 90–90–90 targets.

Botswana, which has been providing free access to antiretroviral therapy since 2002, has leveraged sustained political and financial commitments to reach service coverage at levels consistent with the 90–90–90 targets. As in most countries, timely diagnosis of people living with HIV remains a major challenge. Botswana’s national strategy to reach the first 90 prioritizes high-yield approaches such as notifying and testing partners, ensuring sex workers have ready access to HIV testing, and integrating HIV testing into tuberculosis services (4). A household survey conducted in 2013–2015 found that 70% of people living with HIV had suppressed viral loads (5). The most recent country data reported to UNAIDS suggest that an estimated 85% of people living with HIV in Botswana were aware of their

HIV status, more than 90% who were aware of their status were accessing antiretroviral therapy, and 90% of people on treatment had suppressed viral loads (Figure 3.10). This translates into 78% of all people living with HIV in Botswana being virally suppressed.

Cambodia has made 90–90–90 the cornerstone of its national AIDS response, and it is on track to achieve the targets by 2020. The country adopted a treat all strategy in 2016; the 90–90–90 targets are included in its national HIV strategy for 2016–2020; and the national HIV monitoring and evaluation system tracks outputs and outcomes across the HIV treatment cascade (7). With technical assistance from PEPFAR, UNAIDS and the World Health Organization (WHO), Cambodia is undertaking a comprehensive effort to strengthen its national HIV strategic information system and link all HIV-related databases within a single system (7). This enhanced data system will play a key role in identifying and closing gaps in the testing and treatment cascades at the provincial level and driving progress towards the national goal to end AIDS as a public health threat by 2025, five years earlier than the target in the 2030 Agenda for Sustainable Development. Country data show that 80% of all people living with HIV in Cambodia are on treatment and 75% of all people living with HIV are virally suppressed.

Other countries have achieved or are close to achieving the target of 73% of all people living with HIV having suppressed viral load are Australia, Belgium, Denmark, France, Germany, Iceland, Italy, Kuwait, Luxembourg, Netherlands, Singapore, Spain, Swaziland, Sweden, Switzerland and the United Kingdom of Great Britain and Northern Ireland.<sup>2</sup>

### BOTSWANA HAS ACHIEVED THE 90–90–90 TARGETS

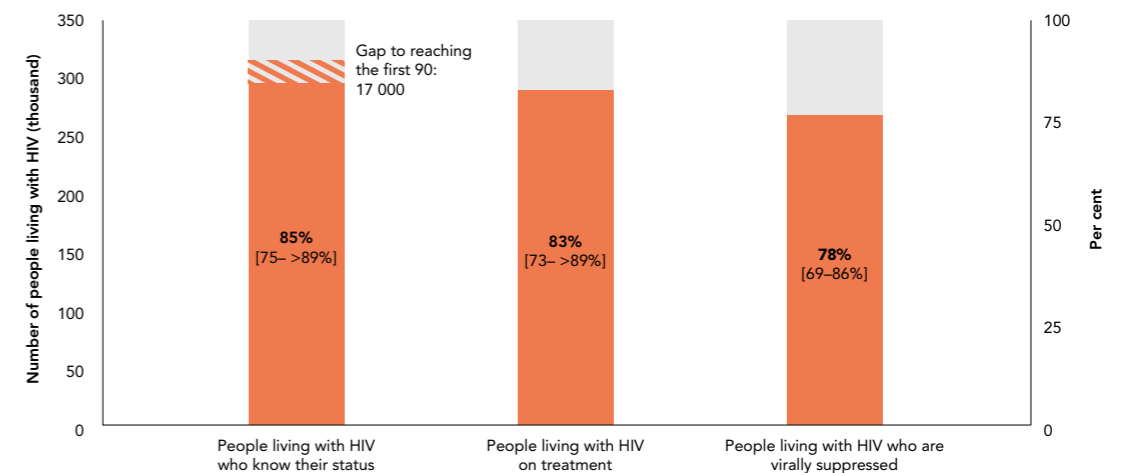


FIGURE 3.10. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, BOTSWANA, 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

<sup>2</sup> According to the most recent country data reported to UNAIDS.

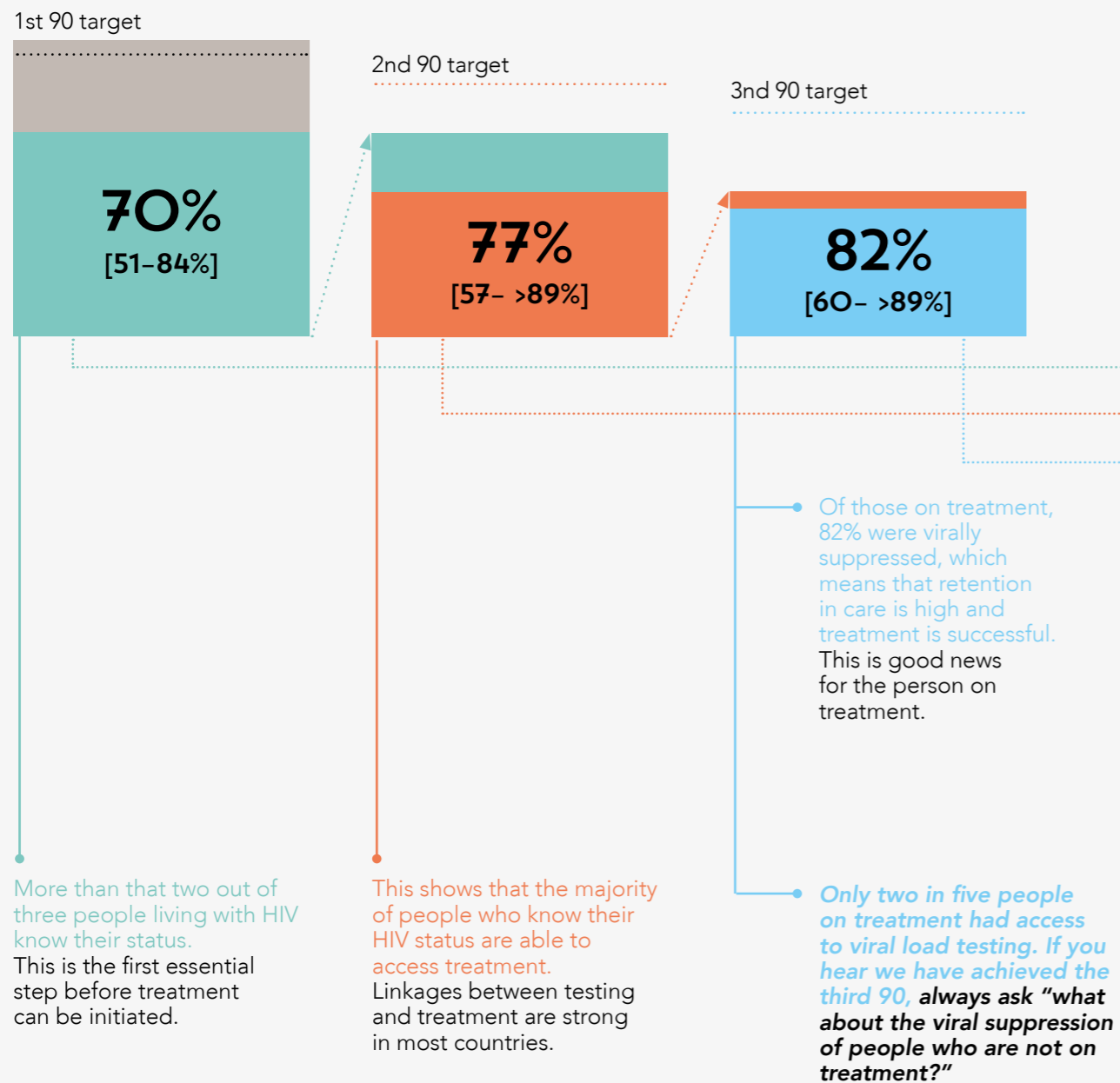
## WHAT'S THE DIFFERENCE?

### UNDERSTANDING MEASURES OF PROGRESS TOWARDS 90-90-90

#### 90-90-90 TARGETS

For each of the 90-90-90 targets, the denominator is different. The first 90 value (70%) is the denominator for the second 90, and the second 90 value (77%) is the denominator for the third 90.

People living with HIV who know their status      People living with HIV who know their status and are on HIV treatment      People on HIV treatment who are virally suppressed

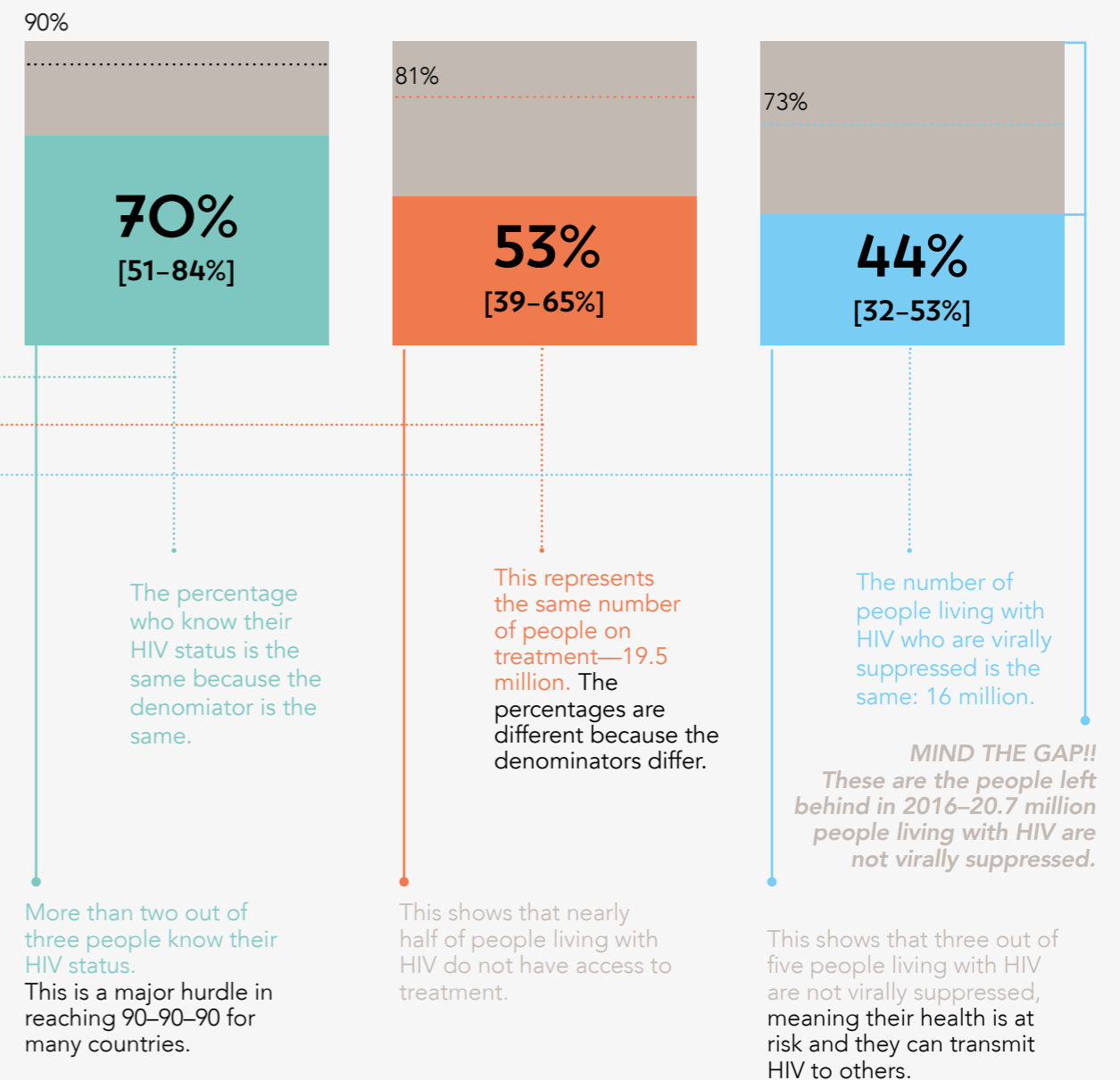


The 90-90-90 targets and the HIV testing and treatment cascade are two ways of looking at the same data. The targets were instrumental in galvanizing global action for HIV treatment access. Full achievement of 90-90-90 is equal to viral load suppression among 73% of all people living with HIV.

#### HIV TESTING AND TREATMENT CASCADE

Across the cascade, the denominator for each step remains the same: all people living with HIV.

People living with HIV who know their status      People living with HIV on treatment      People living with HIV who are virally suppressed



# AMSTERDAM

## CITY CASE STUDY

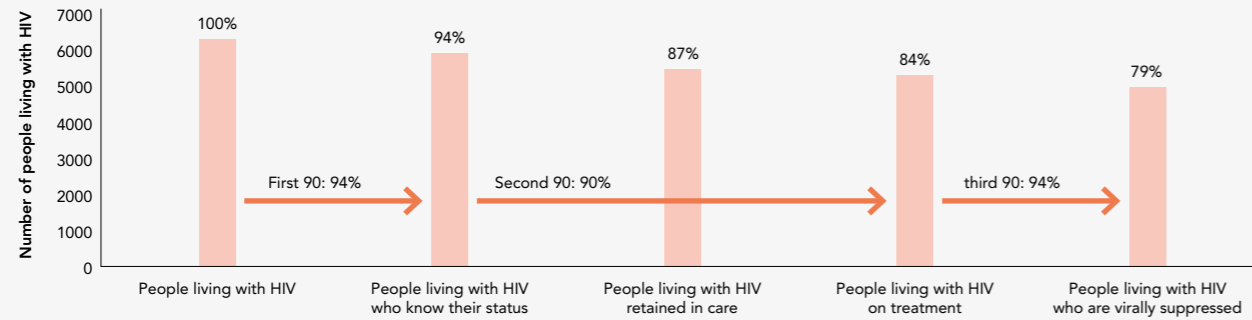


FIGURE 3.11. HIV TESTING AND TREATMENT CASCADE, AMSTERDAM, 2015

Source: Stichting HIV Monitoring, 2017.

Amsterdam is among the first cities to reach and exceed the 90–90–90 targets. Home to over one quarter of all of the people living with HIV in the Netherlands, Amsterdam has used a reliable and accessible public health system to full effect. A wide range of flexible entry points are available for HIV testing and sexual health promotion, especially for gay men and other men who have sex with men. This has reduced the number of people living with HIV who are unaware of their HIV status. Harm reduction services also have been integrated into the city’s HIV strategy and have reached high coverage among people who inject drugs. Once people are diagnosed with HIV, they are efficiently linked to a network of experienced clinical centres that provide universal access to expert HIV treatment and care.

Community engagement has been key to the city’s AIDS response. In addition to education and the

promotion of safer sex, community organizations provide support to people living with HIV all along the cascade of treatment and care services.

The annual number of HIV diagnoses in the city has declined by nearly half, down from 320 in 2010 to 162 in 2015 (8). Nevertheless, a significant proportion of new diagnoses each year are among people with advanced infection. A major current challenge is therefore to diagnose infections earlier and to link all diagnosed individuals promptly to treatment. The HIV Transmission Elimination Amsterdam initiative is developing and implementing innovative strategies to expand testing and immediate treatment for HIV, thus enabling the city to further improve treatment coverage and rates of viral suppression (9).

*Programme description and data were provided to UNAIDS by Stichting HIV Monitoring (<https://www.hiv-monitoring.nl/index.php/nederlands/>).*



## PROGRESS AND CHALLENGES ACROSS THE LIFE CYCLE

As people progress through life, their HIV testing and treatment needs change, as do the facilitators and barriers to service uptake. These changes relate to age, sex, gender identity and behaviours that place individuals at higher risk of HIV infection. Recognizing these shifts and establishing enabling environments that respect and protect human rights and facilitate access to services is essential to plugging gaps along the HIV testing and treatment cascade, achieving the 90–90–90 targets by 2020 and ultimately reaching all people living with HIV.

### Children living with HIV

Efforts to eliminate mother-to-child transmission of HIV (see Chapter 5) have greatly reduced the number of children being newly infected with HIV. Diagnosing and treating those who do acquire the virus remains a priority. A large collaborative study spanning Africa, the Americas and Asia suggests that large proportions of children younger than two years who are living with HIV—as much as two thirds of them—are diagnosed late and start antiretroviral therapy with advanced immunodeficiency (10). As a result, mortality rates among these children are high.

Children younger than 18 months of age who are born to HIV-positive mothers require virological testing. In many countries, however, this involves formidable logistical challenges, and there has been limited progress on this front. In several countries, access to early infant diagnosis continues to rise, including Cameroon, Côte d’Ivoire and Ethiopia, which in the past have had particularly low coverage (Figure 3.12). Only three high-burden countries (South Africa, Swaziland and Zimbabwe) provided virological testing to at least 70% of HIV-exposed infants within the first two months of life in 2016.

### EARLY INFANT DIAGNOSIS

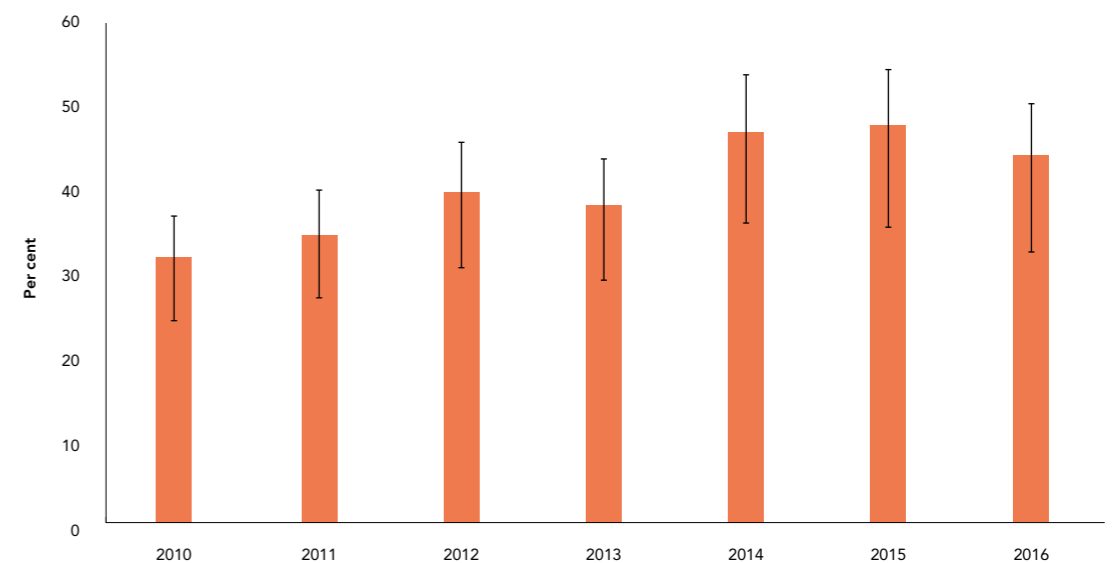


FIGURE 3.12. PERCENTAGE OF HIV-EXPOSED INFANTS WHO HAVE BEEN DIAGNOSED WITHIN TWO MONTHS OF BIRTH, 21 HIGH-BURDEN COUNTRIES, 2013 AND 2016

Source: Global AIDS Monitoring, 2017; UNAIDS 2017 estimates.

As children grow older, they are less likely to interact regularly with health services. Significant numbers of children who acquired HIV through mother-to-child transmission are presenting for treatment for the first time as adolescents with mounting health problems (11, 12). Standard provider-initiated testing approaches struggle to diagnose children living with HIV. HIV testing facilities are rarely child-friendly, and caregivers may be reluctant to have a child tested for HIV. Countries are increasingly seeking to identify children living with HIV through index testing that links them to adults and siblings who have tested HIV-positive. Many high-prevalence countries have been linking HIV testing with child immunization services; they also have been offering testing in paediatric in-patient wards or as part of nutrition support programmes, community child care services and other child health services (13, 14).

Globally, an estimated 919 000 [810 000–956 000] children (aged 0–14 years) were on antiretroviral therapy in 2016, about 43% [30–54%] of all children living with HIV. The rate of increase in the number of children on treatment has slowed in recent years, falling to an annual increase of 6% in 2016 from an annual increase of over 10% in previous years. At the current rate of increase, the world risks not reaching the target of providing antiretroviral therapy to 1.6 million children by 2018 (Figure 3.13).

### SLOWING SCALE-UP OF PAEDIATRIC TREATMENT

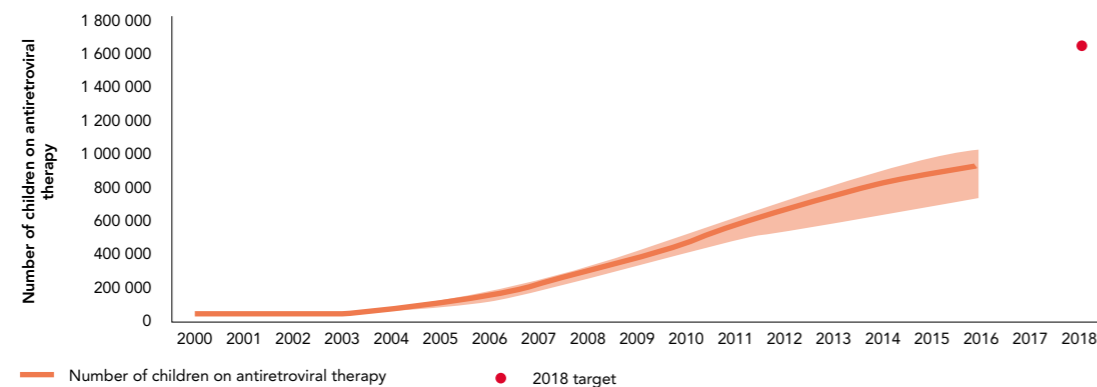


FIGURE 3.13. NUMBER OF CHILDREN AGED 0–14 YEARS ACCESSING ANTIRETROVIRAL THERAPY, GLOBAL, 2000–2016 PLUS 2018 TARGET

Source: UNAIDS 2017 estimates. Global AIDS Monitoring, 2017.

Improved paediatric treatment coverage has contributed to a threefold increase over a 10-year period in the number of children living with HIV who survive to adolescence. The transition from childhood to adulthood, however, can be difficult for adolescents accessing antiretroviral therapy. Globally, HIV remained the seventh leading cause of death among children aged 10–14 years in 2015, and it was the ninth leading cause of death among adolescents overall (aged 10–19 years), despite the availability of effective treatment (15).

Increasingly, national HIV plans are responding to the special needs of adolescents living with HIV when it comes to support to remain in care and adhere to antiretroviral therapy. Globally, about 60% (64 of 107) of reporting countries in 2016 stated that they had such a strategy or plan. In eastern and southern Africa, 74% of reporting countries in 2016 stated they had a strategy or plan to ensure adolescents born with HIV are not lost to follow-up as they transition into adult HIV care. Yet in more than half (59%) of the reporting countries in that region, people younger than 18 years required parental consent to access HIV treatment.

Windhoek, Namibia’s capital, is home to about 14% of the national population of 2.3 million. Urbanization has led to the growth of informal settlements surrounding the city, making it difficult to reach residents with critical health and HIV services. The national treatment monitoring system showed that, as of the end of March 2017, there were 23 031 people on antiretroviral therapy in the city, out of a national total of 151 000. HIV prevalence and incidence among people aged 15–49 years in the Khomas region, which contains more than 90% of the people living with HIV in Windhoek, were estimated at 12% and 0.8%, respectively, in 2016.

Windhoek has endorsed the 2014 Paris Declaration on ending the AIDS epidemic, and it has developed an evidence-based strategic plan to move the agenda forward. According to a 2016 evaluation, the city has reached 95% coverage of services to prevent mother-to-child transmission, and it has reduced mother-to-child HIV transmission below 5% (2% among newborns and 4% after six months of breastfeeding).

In 2016, UNAIDS and the United Nations Children’s Fund (UNICEF) supported the Government of Namibia to conduct an evaluation of the programme to prevent mother-to-child transmission of HIV. One of the key challenges identified was adherence among women living in informal settlements due to lack of knowledge, logistics issues with accessing health facilities, and stigma and discrimination. Under the leadership of the Minister of Health and Social Services, the First Lady of Namibia and the Mayor of Windhoek, a strategic partnership was developed within the Start Free, Stay Free, AIDS Free campaign to increase access to HIV services in informal settlements. In addition, the Namibia Women’s Health Network has established door-to-door campaigns to reach pregnant women in these informal settlements with a package of services, including information, counselling and referral to clinics with logistic support. According to the network, as of April 2017 100 impoverished pregnant women living with HIV from three informal settlements were supported to adhere to programmes to prevent transmission to their infants. In 2017, the programme is being extended to other towns and remote areas.

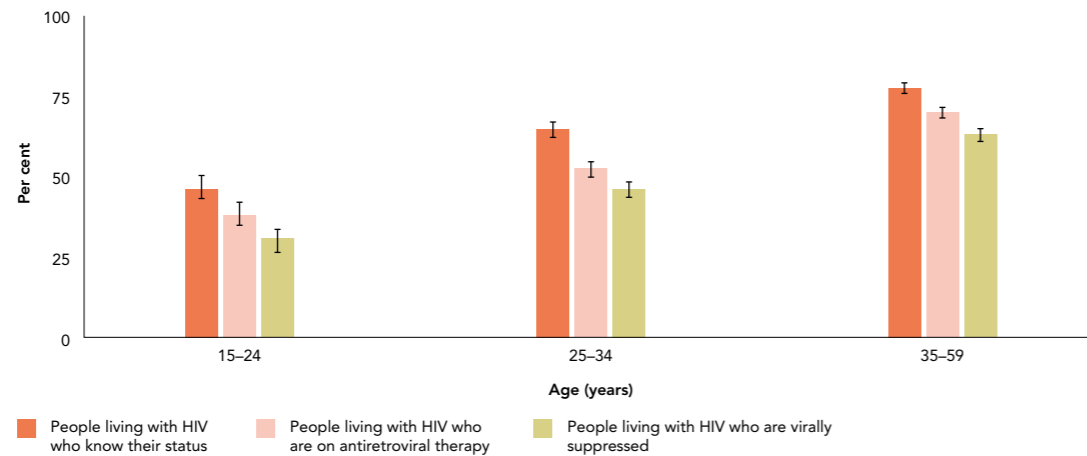


## Young people living with HIV

Young people (aged 15–24 years) continue to be at great risk of HIV infection, especially young women in sub-Saharan Africa. Outside sub-Saharan Africa, most young people acquiring HIV are sex workers, gay men and other men who have sex with men, people who inject drugs, or transgender people.

Available data suggest that large proportions of young people living with HIV have not been diagnosed. For example, the Population-based HIV Impact Assessments (PHIAs) conducted in Malawi, Zambia and Zimbabwe in 2015–2016 found that less than half of young people (aged 15–24 years) living with HIV were aware of their HIV status. That was compared to 65% of adults aged 25–34 years and 78% of adults aged 35–59 years (Figure 3.14) (16).

### LARGER GAPS FOR YOUNG PEOPLE ACROSS THE CASCADE



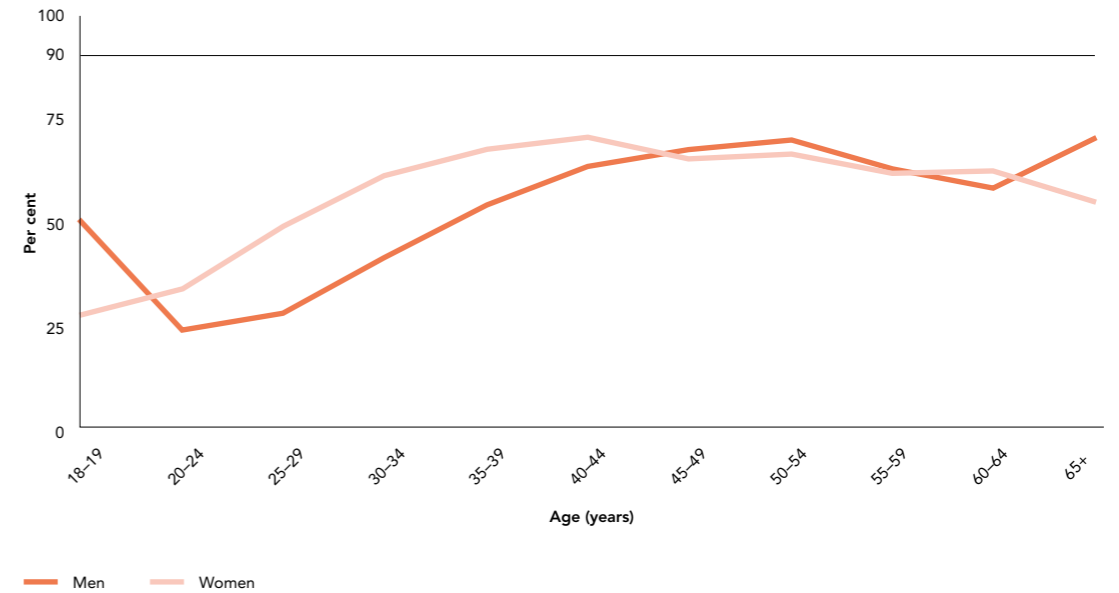
**FIGURE 3.14. KNOWLEDGE OF HIV STATUS, TREATMENT COVERAGE AND VIRAL LOAD SUPPRESSION, MALAWI, ZAMBIA AND ZIMBABWE, BY AGE, 2015–2016**

Source: Malawi population-based HIV impact assessment (MPHIA), 2015–2016. Summary sheet: preliminary findings. New York: PHIA Project; December 2016. Zambia population-based HIV impact assessment (ZAMPHIA), 2015–2016. Summary sheet: preliminary findings. New York: PHIA Project; December 2016. Zimbabwe population-based HIV impact assessment (ZIMPHIA), 2015–2016. Summary sheet: preliminary findings. New York: PHIA Project; December 2016.

This large gap in awareness also is evident in age-disaggregated baseline data from two community-based studies being conducted in eastern and southern Africa. In the 32 rural communities in Kenya and Uganda being serviced by the Sustainable East Africa Research on Community Health (SEARCH) project, knowledge of HIV status among young people (aged 15–24 years) living with HIV at baseline was 50%, compared to 67% among adults aged 25 and older (17). Before the HPTN 071 (PopART) trial’s community-based services were offered in Zambia, just 24% of men living with HIV aged 20–24 years and 34% of women living with HIV aged 20–24 years were aware of their HIV status (18).

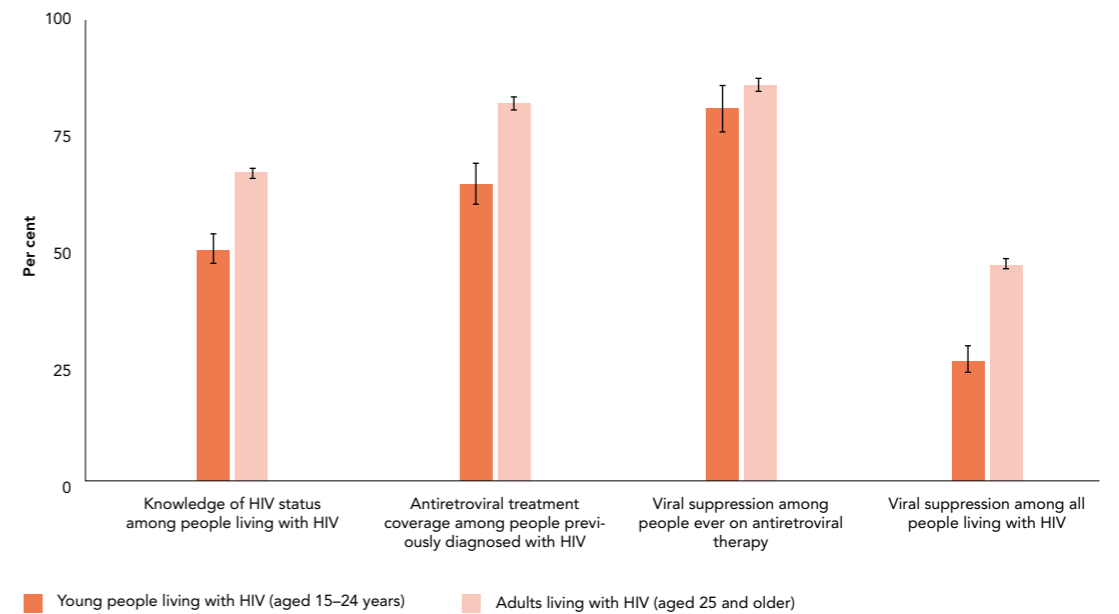
Treatment coverage also varies among age groups. A recent study in Bangladesh, Indonesia, Lao People’s Democratic Republic, Nepal, Pakistan, Philippines and Viet Nam found that people younger than 25 years were least likely to start or remain on antiretroviral therapy (19). In the SEARCH trial, baseline treatment coverage among young people (aged 15–24 years) previously diagnosed with HIV was 64%, compared to 81% among older adults (aged 25 and above) living with HIV (17). The PHIAs, however, showed high coverage of treatment (82%) among young people (aged 15–24 years) who were aware of their HIV status (16).

## LOWER AWARENESS OF HIV STATUS AMONG YOUNG PEOPLE LIVING WITH HIV



**FIGURE 3.15. HPTN 071 (POPART) TRIAL: KNOWLEDGE OF HIV STATUS AMONG MEN AND WOMEN LIVING WITH HIV, BY AGE, BEFORE COMMUNITY-BASED SERVICES, ZAMBIA, NOVEMBER 2013 TO JUNE 2015**

Source: Hayes R, Floyd S, Schapp A, Shanaube K, Bock P, Sabapathy K et al. A universal testing and treatment intervention to improve HIV control: one-year results from intervention communities in Zambia in the HPTN 071 (PopART) cluster-randomised trial. PLoS Med. 2017;15(5):e1002292. \* Data are extrapolated to the total adult population.



**FIGURE 3.16. 90-90-90 AT BASELINE AMONG PEOPLE LIVING WITH HIV AGED 15 YEARS AND OLDER, BY AGE, 16 COMMUNITIES IN RURAL KENYA AND UGANDA, JUNE 2013 TO JUNE 2014**

Source: Petersen M, Balzer L, Kwarisima D, Sang N, Chamie G, Ayieko J et al. Association of implementation of a universal testing and treatment intervention with HIV diagnosis, receipt of antiretroviral therapy, and viral suppression in East Africa. JAMA. 2017;317(21):2196–2206.

Treatment adherence among young people is generally lower and treatment failure rates are comparatively higher, especially among adolescents who are transitioning from paediatric to adult care. Studies in Kenya, Uganda and the United Republic of Tanzania indicate that young people aged 15–19 years are more likely to drop out of HIV care, both before and after starting antiretroviral therapy, than are those aged 10–14 years or those older than 20 years. Studies suggest that stigma, discrimination and disclosure issues, as well as travel and waiting times at clinics, are among the reasons (19–21).

In the three PHIA and the baseline SEARCH data, the large gaps in knowledge of status, combined with other gaps across the continuum, added up to low rates of viral suppression among young people (aged 15–24 years) living with HIV: they were 30% in the PHIA and 26% in the SEARCH areas at baseline (16, 17).

### Men and boys living with HIV

Men’s health outcomes are typically worse than those of women, a gender gap that has been attributed to a range of factors, from greater risk-taking to poor uptake of health services (22). In almost all regions, men living with HIV are less likely than their female counterparts to take an HIV test or start treatment (23), and those who do initiate antiretroviral therapy are more likely to have advanced disease (24). In 2016, coverage of HIV treatment globally was 60% [46–71%] among adult women (aged 15 and older) living with HIV and 47% [35–57%] among adult men living with HIV. Coverage was lower among men than women in all regions except western and central Europe and North America (Figure 3.17).

Men are typically also more likely than women to interrupt treatment and be lost to follow-up (25–27). In South Africa, for example, it is estimated that 51% of women living with HIV are on antiretroviral therapy compared with 37% of men living with HIV (28). Consequently, men are more likely than women to die of AIDS-related causes, even in sub-Saharan Africa, a region where men are less likely than women to acquire HIV (29–31).

### TREATMENT COVERAGE LOWER AMONG MEN

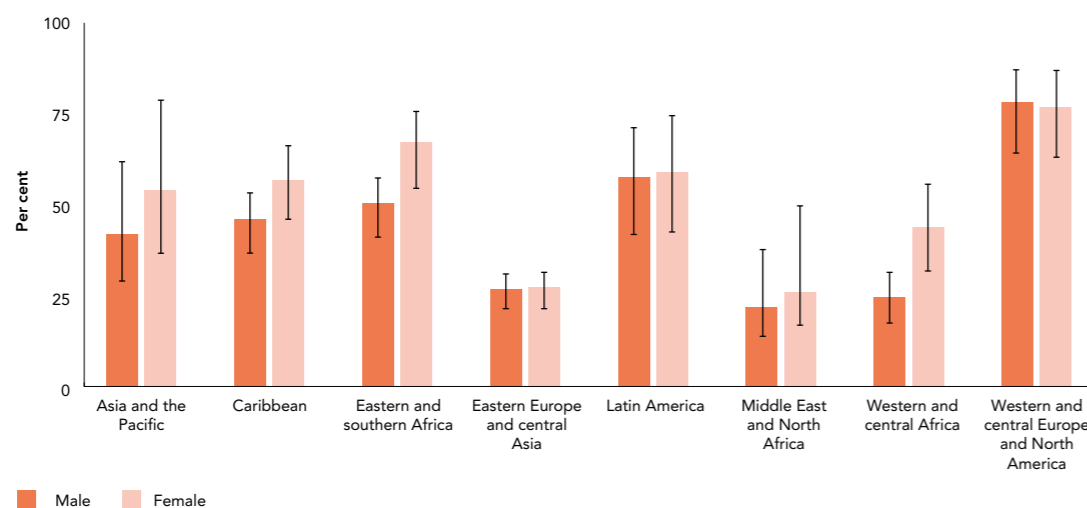


FIGURE 3.17. ANTIRETROVIRAL THERAPY COVERAGE AMONG ADULTS LIVING WITH HIV AGED 15 YEARS AND OLDER, BY SEX, BY REGION, 2016

Source: Global AIDS Monitoring, 2017. UNAIDS 2017 estimates.

Data from the PHIA surveys are illustrative. Compared to women of the same age, adult men (aged 15–59 years) living with HIV in Malawi, Zambia and Zimbabwe were less aware of their HIV status and less likely to be accessing treatment (32–34). These gaps were larger in Malawi and Zimbabwe, where viral suppression among adult men (aged 15–59 years) living with HIV was 61% and 53% respectively, compared to 73% and 64% among women of the same age (Figure 3.18) (16).

### MEN LESS LIKELY THAN WOMEN TO HAVE SUPPRESSED VIRAL LOADS

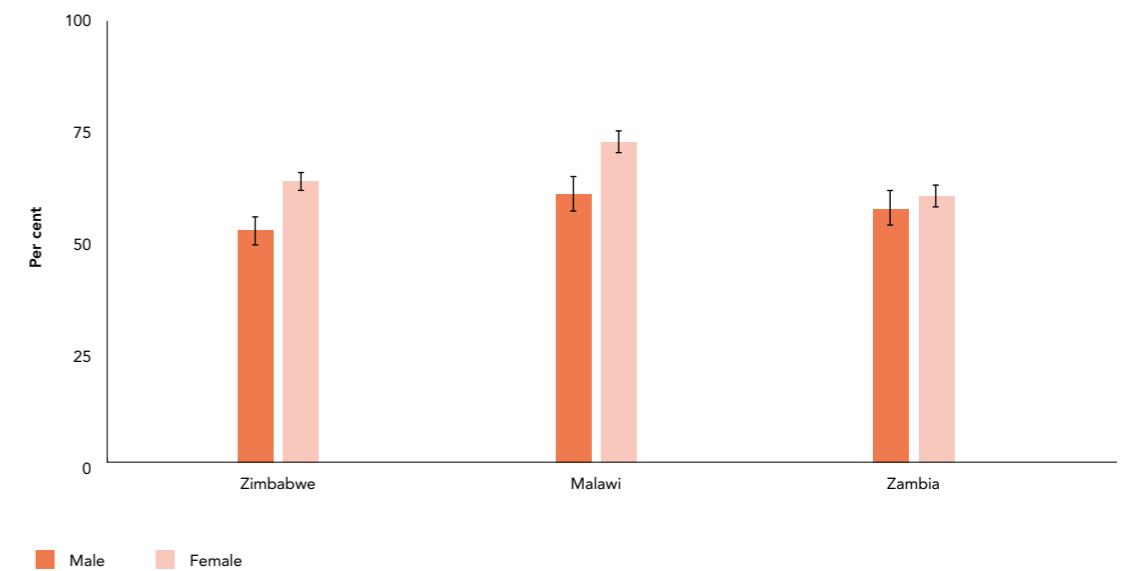


FIGURE 3.18. PERCENTAGE OF ADULTS (AGED 15–59 YEARS) LIVING WITH HIV WHO ARE VIRALLY SUPPRESSED, BY SEX, MALAWI, ZAMBIA AND ZIMBABWE, 2015–2016

Source: Malawi population-based HIV impact assessment (MPHIA), 2015–2016. Summary sheet: preliminary findings. New York: PHIA Project; December 2016. Zambia population-based HIV impact assessment (ZAPHIA), 2015–2016. Summary sheet: preliminary findings. New York: PHIA Project; December 2016. Zimbabwe population-based HIV impact assessment (ZIMPHIA), 2015–2016. Summary sheet: preliminary findings. New York: PHIA Project; December 2016.

Prevailing gender norms fuel these trends in several ways (see box). Current service models often perpetuate stereotypes that regard health care as a female concern and task women with the responsibility of managing men’s health care (35). Few HIV treatment programmes actively address the challenge of antiretroviral therapy access and uptake among men.

There are numerous ways to reach more men with testing services and link them to care. Workplace testing and community outreach can increase testing yield among men, and the use of mobile testing units can reach greater numbers of men and first-time testers (36). Programmes for the prevention of mother-to-child transmission can be used more proactively to engage and link male partners to testing, care and prevention services. Index partner, couple and family testing is an efficient method for identifying the male partners of HIV-positive women who are diagnosed through antenatal services (37). Finally, assisted partner notification and HIV self-testing are promising options for people, such as men, who are unable or reluctant to use existing testing services (38, 39).



## HARMFUL GENDER NORMS SPARE NO ONE

While they are detrimental to women, harmful masculine gender norms can also jeopardize men's health and well-being. Studies from sub-Saharan Africa, for example, show that when men equate manhood with dominance over women, having multiple sex partners, refusal to use condoms, and alcohol and substance abuse, they put themselves and their partners at greater risk for HIV infection (40–42). In addition, men in all regions are less likely than women to take an HIV test or to seek, use and adhere to HIV treatment (25–27, 43).

Prevailing gender norms fuel these trends in several ways. Men's anxieties about being seen as less masculine is one reason for not seeking timely HIV testing, counselling, treatment and care services (44). Current health service models, however, also perpetuate stereotypes that position health care as a mainly female concern. Efforts to promote the use of health-care services and safer sex often also target women and girls, reinforcing notions that health is a so-called women's issue. Other approaches are feasible: EngenderHealth and the United Nations Population Fund (UNFPA) have developed a toolkit for designing programmes in ways that engage men more actively around sexual and reproductive health issues (45).

There is increasing recognition of the need to engage men and boys to change harmful gender norms and address the HIV epidemic's gender dimensions. Experiences show that men and boys are willing and able to abandon rigid and discriminatory gender roles, reject harmful versions of masculinity, and embrace alternative and gender-equitable norms. Several programmes—such as the SASA! community mobilization programme in Uganda, Yaari Dosti in India and various Stepping Stones participatory learning projects—have been found to reduce risk behaviours in men, including intimate partner violence (46–51).

### Key populations living with HIV

Members of key populations—sex workers, gay men and other men who have sex with men, people who inject drugs, transgender people and prisoners—and their sex partners account for the majority of new HIV infections outside of sub-Saharan Africa (see Chapter 2).

These key populations are confronted by unique barriers to HIV testing and treatment services. Widespread stigma, punitive laws and abusive law enforcement practices persist. Almost three quarters of reporting countries (84 of 110) criminalized some aspect of sex work in 2016, while the possession or use of narcotics was criminalized in 78 countries.<sup>3</sup> Ten countries retained the death penalty for people convicted of drug-related offences, and a further 10 countries reported that possession of a needle or syringe without a prescription could be used as evidence of drug use or cause for arrest.<sup>4</sup> In some countries, notably the Philippines, anti-drug policies are being implemented in an increasingly violent manner, including extra-judicial killings of alleged drug dealers and users.

In 2016, 44% of reporting countries (44 of 100) criminalized same-sex sexual relations, with some jurisdictions permitting very harsh penalties as punishment: two countries permitted the death penalty, and five other countries had a minimum prison sentence of 14 years. In recent years there has been a marked increase in anti-gay legislation in several

<sup>3</sup> Possession of drugs for personal use is specified as a criminal offence in 34 countries, drug use or consumption is a specific offence in law in 41 countries, and possession of drugs for personal use is specified as a non-criminal offence in 12 countries. Three countries reported compulsory detention for drug offences.

<sup>4</sup> The 10 countries that retain the death penalty are Bangladesh, China, Kuwait, Libya, Malaysia, Myanmar, Oman, Pakistan, Singapore and Sri Lanka. The 10 countries that consider possession of a needle or syringe without a prescription as potential evidence of drug use or cause for arrest are Burundi, Georgia, Honduras, Mauritius, Namibia, Nepal, Pakistan, the Philippines, South Africa and the United Republic of Tanzania.

## CRIMINALIZATION OF KEY POPULATIONS IS A BARRIER TO TESTING AND TREATMENT SERVICES

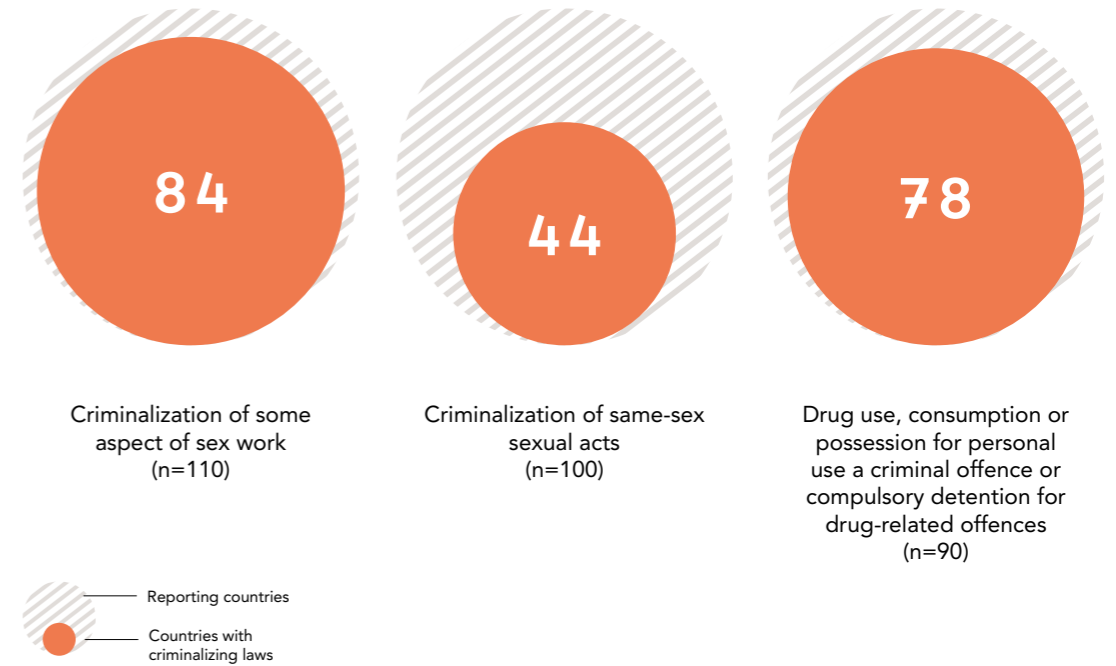


FIGURE 3.19. COUNTRIES WITH LAWS THAT CRIMINALIZE SOME ASPECTS OF SEX WORK, SAME-SEX SEXUAL RELATIONS OR THE POSSESSION OR USE OF DRUGS, 2016

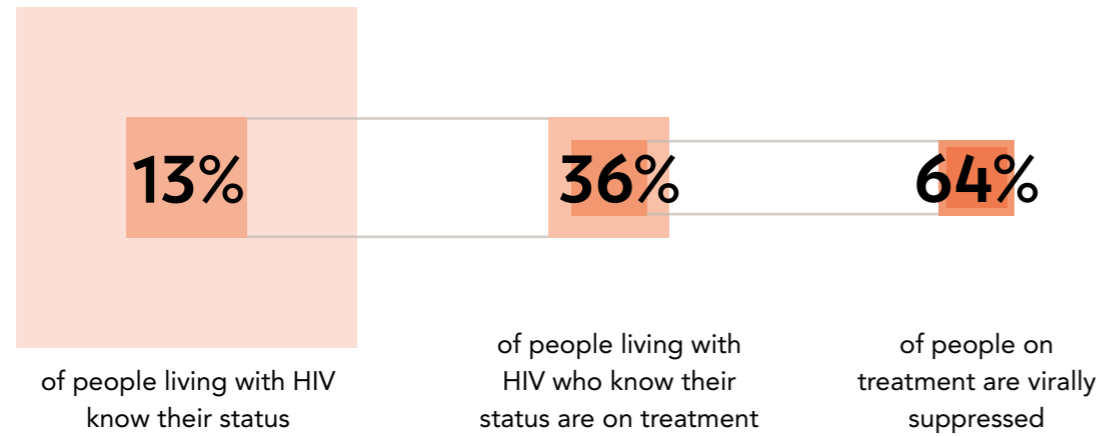
Source: 2017 National Commitments and Policy Instrument.

countries (52). For example, following the passage of the Same-Sex Marriage Prohibition Act in Nigeria in 2014, a greater proportion of men who have sex with men in the country reported being afraid to seek health care (53).

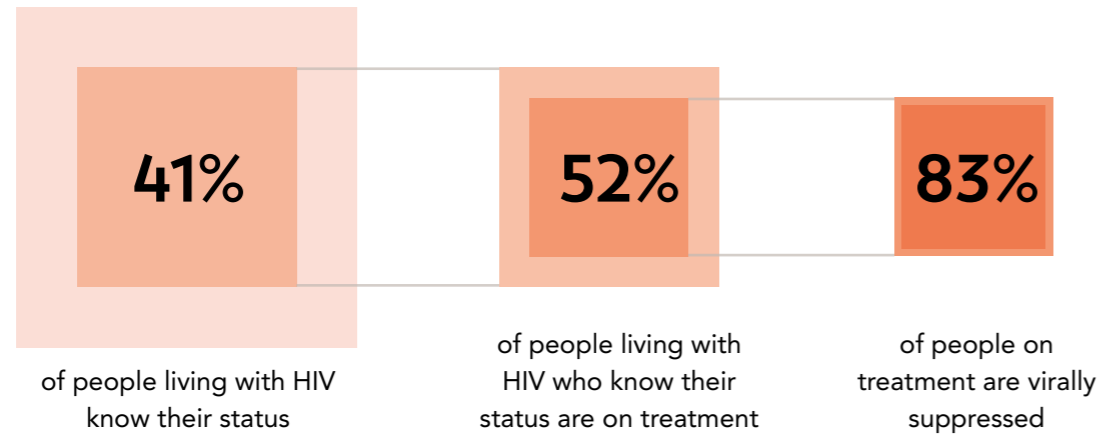
Data remain extremely limited on treatment cascade outcomes for key populations (54). Special studies show that one or more gaps are alarmingly large. In India, a respondent-driven sampling survey across 26 cities found that knowledge of HIV status was 41% among people living with HIV who inject drugs. Of those who knew their HIV status, only 52% were accessing antiretroviral therapy and 83% of those accessing treatment were virally suppressed (55). Among gay men and other men who have sex with men living with HIV who also were surveyed, 30% knew their HIV status, 68% of those who knew their HIV status were accessing treatment, and 78% of those on treatment were virally suppressed (55). In Moscow, a similar survey among gay men and other men who have sex with men found that just 13% of those living with HIV knew their HIV status, 36% of those who knew their HIV status were accessing antiretroviral therapy, and 64% of those accessing treatment were virally suppressed (56).

ALARMING GAPS IN THE 90-90-90 CONTINUUM AMONG KEY POPULATIONS

Gay men and other men who have sex with men, Moscow



People who inject drugs, India



Gay men and other men who have sex with men, India

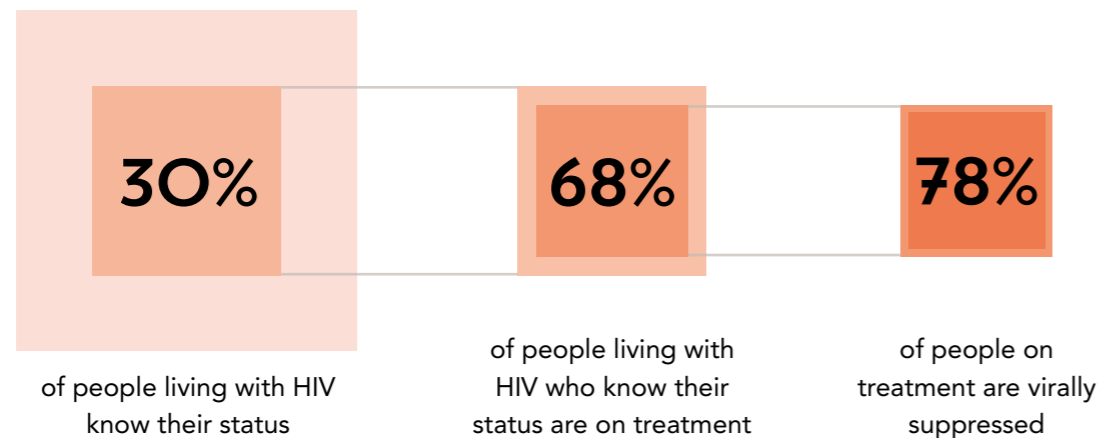


FIGURE 3.20. 90-90-90 AMONG KEY POPULATIONS IN INDIA AND THE RUSSIAN FEDERATION, 2013.

Source: Mehta SH, Lucas GM, Solomon S, Srikrishnan AK, McFall AM, Dhingra N et al. HIV care continuum among men who have sex with men and persons who inject drugs in India: barriers to successful engagement. *Clin Infect Dis*. 2015 Dec 1;61(11):1732-41. Wirtz A, Zelaya C, Latkin C, Peryskhina A, Galai N, Mogilnyi V et al. The HIV care continuum among men who have sex with men in Moscow, Russia: a cross-sectional study of infection awareness and engagement in care. *Sexually Transm Infect*. 2016;92(2):161-167. doi:10.1136/sextrans-2015-052076.

# BANGKOK

CITY CASE STUDY

Thailand’s AIDS response has gained well-earned praise over the years, but as the HIV epidemic evolves, constant innovation is needed to sustain past success. In Bangkok, close to one third of the population of almost 9 million are not registered as city residents with local health services. This limits access to the services—including HIV testing and treatment—that are provided at those facilities. The Service Workers in Group Foundation (SWING) was set up in 2004 to bridge those kinds of gaps.

At first, SWING worked with male and transgender sex workers, many of whom have migrated to the city, but it now works with sex workers of all genders. SWING started off by mapping key population establishments in Bangkok to better understand the population that it was going to support and to focus its activities. Teams of SWING outreach workers visit sex work venues every evening, offering advice, information, condoms and referrals. From 2012 to March 2017, more than 16 000 gay men and other men who have sex with men, transgender women and sex workers, along with over 1200 migrants, benefited from SWING services.

SWING’s drop-in centres, located in accessible locations, offer free sexually transmitted infection (STI) and HIV testing and counselling services with same-day results. They also provide psychosocial support and referrals to treatment services. SWING facilitates access to pre-exposure prophylaxis (PrEP) and promotes peer-assisted HIV self-testing, and there is an emphasis on staying connected to clients who test HIV-negative and supporting them with safe sex education, condom promotion and regular HIV testing.

Along with the commitment of staff and volunteers, a key element of SWING’s success has been the trusting working relationships it has developed with partners that range from sex work establishments in the target areas to government agencies, including the Bangkok Metropolitan Authority and the police.

*Programme description and data were provided to UNAIDS by Surang Janyam, Director, and Saman Sumalu, Monitoring and Evaluation Officer, SWING.*



## REGIONAL PROGRESS TOWARDS THE 90-90-90 TARGETS

Progress towards 90-90-90 varies among regions. Western and central Europe and North America have already nearly achieved global testing and treatment targets as of 2015. In the remaining regions with sufficient 2016 data, Latin America and eastern and southern Africa show high levels of achievement across the cascade and are within reach of the 90-90-90 targets. If recent progress in the Caribbean and Asia and the Pacific can be sustained, the region may achieve the targets.

Other regions have large gaps in one or more steps along the continuum. Knowledge of HIV status among people living with HIV was lower than 65% in eastern Europe and central Asia, the Middle East and North Africa, and western and central Africa. Like the global 90-90-90 figures, these gaps in the first 90, combined with other gaps along the continuum, add up to low rates of viral suppression among all people living with HIV—a quarter or less in all three regions.

Patterns across the three 90s also vary by region, highlighting particular challenges within a variety of epidemic contexts. In Asia and the Pacific, for instance, where epidemics are located predominantly among key populations, gaps were relatively larger in knowledge of HIV status (71% [47– >89%]) and treatment coverage among those who knew their HIV status (68% [44– >89%]) than in viral suppression rates among people on treatment (83% [55– >89%]). By contrast, the Caribbean had high treatment coverage among those who knew their HIV status (81% [64– >89%]), but just two thirds of people accessing antiretroviral therapy were virally suppressed. The Middle East and North Africa and Eastern Europe and central Asia had a pronounced gap in the second 90 (41% [26–71%] and 45% [35–52%], respectively) which suggests that many people diagnosed with HIV in the two region are not being properly linked to care.

While regional patterns are useful for highlighting areas where intensified efforts are needed, there is notable variation in progress within every region. This underscores the need to tailor strategies to particular national and subnational conditions (see the individual chapters on the eight regions for more details).

## IMPACT OF VIRAL SUPPRESSION

The steady scale-up of antiretroviral therapy among people living with HIV is predominantly responsible for the global decline in AIDS-related deaths (see Chapter 2). In countries with high HIV burdens, the population-level impact of the virus and the roll-out of treatment can be seen clearly over time. In the 1990s and early 2000s, as AIDS-related deaths mounted in the 10 hardest-hit countries of eastern and southern Africa, life expectancy declined from 55.0 years in 1990 to 48.9 years in 2006. This population-level impact reversed after antiretroviral therapy became widely available, and life expectancy steadily rose, reaching 58.4 years in 2015 (Figure 3.21).

LIFE EXPECTANCY REBOUND FOLLOWING TREATMENT SCALE-UP

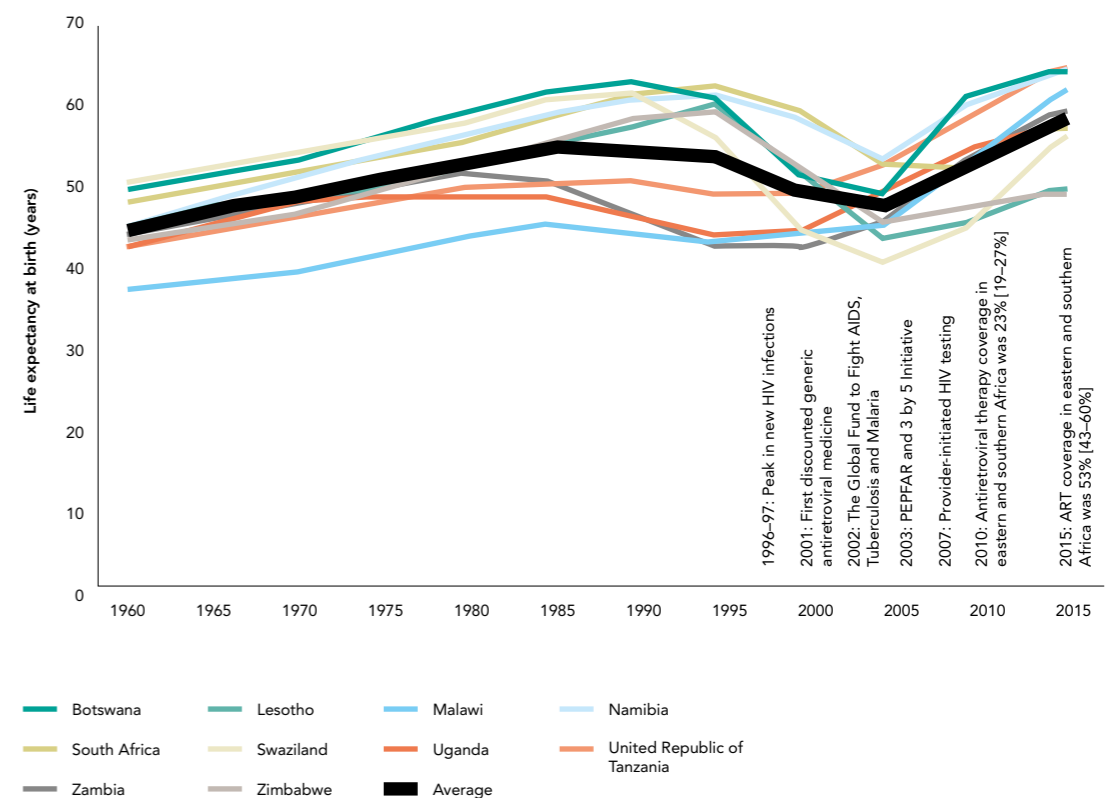


FIGURE 3.21. LIFE EXPECTANCY FOR 10 COUNTRIES IN EASTERN AND SOUTHERN AFRICA, 1960–2016

Source: UNAIDS analysis of data from United Nations Department of Economic and Social Affairs, Population Division, World Population Prospects: 2015 revision.

Enhancing treatment access and improving treatment outcomes also results in lower morbidity, substantial improvements in quality of life and reduced pressures on health systems as fewer people living with HIV require hospitalization (57). In South Africa, for example, the proportion of people living with HIV who reported pain fell from 69% to 17% after five years on antiretroviral therapy, while individuals on treatment were nearly nine times less likely to report being fatigued than in the three months prior to starting treatment (58). Starting antiretroviral therapy markedly increased the likelihood of employment for people living with HIV and significantly reduced reported difficulties in performing a job (58). Suppression of viral load to undetectable levels within people living with HIV also greatly reduces the risk of transmitting the virus to others (59–61).

The link between improved treatment outcomes and reductions in new HIV infections is evident in diverse settings. In a population-based cohort in KwaZulu-Natal, South Africa, initiation of antiretroviral therapy was found to be associated with a 77% reduction in HIV incidence from 2005 to 2013 (62). In the United States of America, the number of new HIV infections fell by 18% from 2008 to 2014, the first meaningful decline in new infections in the country in two decades (63); over the same period, rates of viral suppression steadily improved (64). British Columbia, Canada, experienced a similar decline in new HIV diagnoses that has been at least partially attributed to accelerated expansion of antiretroviral therapy and the expansion of harm reduction (65–67). In London, United Kingdom, sharp declines in HIV diagnoses in clinics that account for the majority of diagnoses in the city have been linked to intensified HIV testing and quicker treatment initiation (see the city case study). In most cases, treatment scale-up occurred alongside increases in coverage of high-impact prevention programmes.

Moving forward, it is clear that achieving high rates of viral suppression will play a pivotal role in ending the AIDS epidemic within a comprehensive approach that includes a range of prevention options. Modelling suggests that attaining the 90–90–90 targets will account for close to 50% of the new HIV infections that will be averted through 2030 as a result of the Fast-Track approach (71). Similar projections by researchers showed that, compared to the current pace of scale-up, achieving the 90–90–90 targets in South Africa would prevent more than 2 million new HIV infections, avert more than 2.5 million deaths and save more than 13 million life-years over a decade (72). In Lesotho, modelling indicates that achieving the 90–90–90 targets will reduce the annual number of new HIV infections in the country by more than 75% by 2030, while failing to build on current treatment coverage in the country would lead to increases in HIV incidence and AIDS-related mortality (73).

# LONDON

## CITY CASE STUDY

The 56 Dean Street Clinic is playing a pivotal role in ending the AIDS epidemic in the capital of the United Kingdom. Located in central London, the clinic has prescribed more than one quarter of the PrEP prescriptions in England, and it diagnosed one in four of London's HIV cases in 2016 (68). New data suggest that the clinic is an important case study in how improved antiretroviral therapy outcomes, combined with PrEP uptake, can sharply reduce the risks of HIV transmission.

In recent years, the clinic has prioritized efforts to encourage repeat HIV testing among clients who show a high risk of HIV infection (e.g. those with a rectal STI) and to reduce the time between an HIV-positive diagnosis and treatment initiation. In 2010–2011, the median time between diagnosis and treatment initiation for people in the United Kingdom who seroconverted was 1.4 years. The 56 Dean Street Clinic reduced that gap to 26

days, and in 2016, it instituted new procedures and capacities that further reduced the gap to seven days after diagnosis (69).

Data from Public Health England show that the 56 Dean Street Clinic is among a small group of London clinics that have recently experienced steep reductions in HIV diagnoses among gay men and other men who have sex with men (Figure 3.22). These declines are driving an overall reduction in new HIV diagnoses among gay men and other men who have sex with men in England. This trend has been accompanied by a year-on-year increase in the median CD4 count at diagnosis, suggesting that gay men and other men who have sex with men are being diagnosed earlier (70).

Data suggest that the 56 Dean Street Clinic and other steep-fall clinics have reduced the risk of onward transmission of HIV among their clients.



FIGURE 3.22. NEW HIV DIAGNOSES AMONG GAY MEN AND OTHER MEN WHO HAVE SEX WITH MEN ATTENDING SEXUAL HEALTH CLINICS, ENGLAND, UNITED KINGDOM, 2013–2016

Source: Brown, AE, et al. Fall in new HIV diagnoses among men who have sex with men (MSM) at selected London sexual health clinics since early 2015; testing or treatment or pre-exposure prophylaxis (PrEP)? *Eurosurveillance*, Volume 22, Issue 25, 22 June 2017.

<sup>1</sup> Defined as clinics with at least a 20% decrease in HIV diagnoses and over 40 cumulative diagnoses between October 2014–September 2015 and October 2015–September 2016. Quarterly visits ranged from 19 780 to 22 493 in sexual health clinics in London with a large fall, from 8270 to 9815 in other London sexual health clinics and from 24 215 to 29 174 in sexual health clinics outside London between 2015 and 2016.

Researchers developed a transmissibility ratio to measure this risk of transmission: the number of clients at risk of transmitting HIV (the estimated number of men with a viral load greater than 200 copies/mL) divided by the number of clients at risk of acquiring HIV (HIV-negative men who

were diagnosed with a STI within the last year). The transmissibility ratio in steep-fall clinics in 2015 was 0.49, compared to 1.66 in other London clinics and 1.73 in clinics outside of London (70).



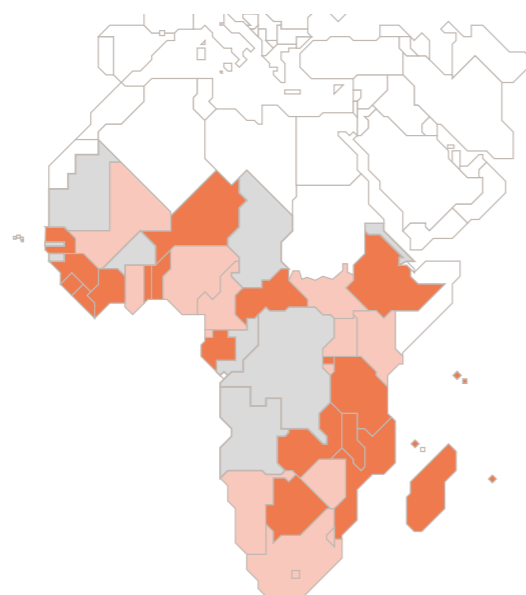
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## 4. CLOSING THE GAPS

### POLICIES FOR COMMUNITY-BASED TREATMENT



■ Yes ■ No ■ No data

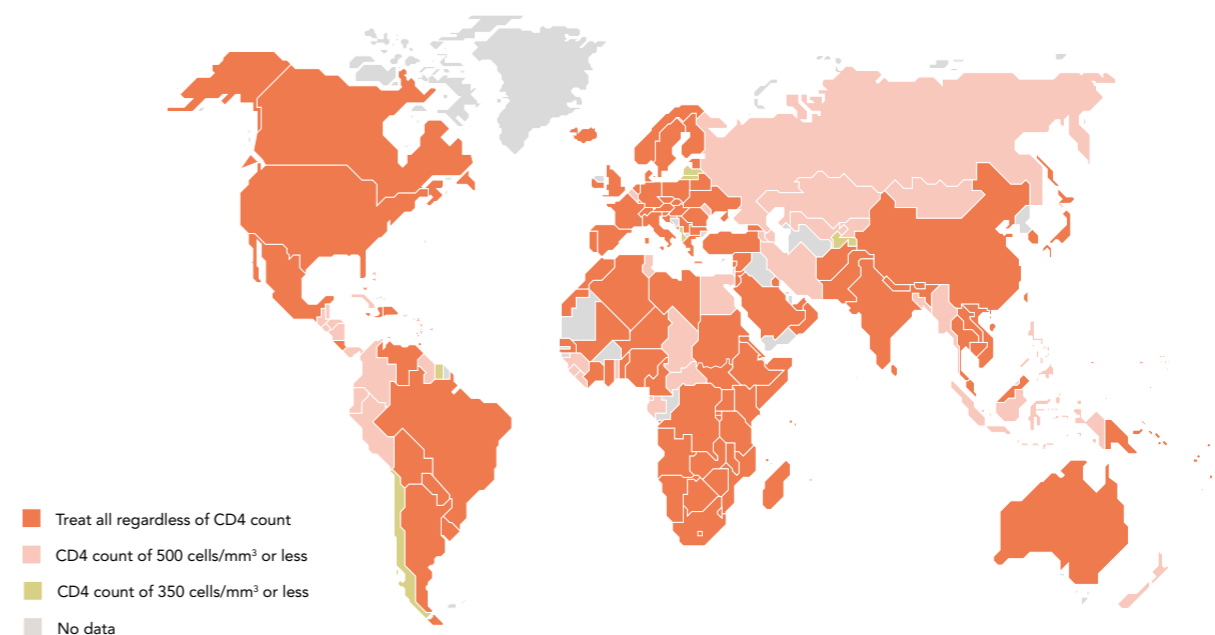
**FIGURE 4.1. COUNTRIES WITH A NATIONAL POLICY PROMOTING COMMUNITY DELIVERY OF ANTIRETROVIRAL THERAPY, SUB-SAHARAN AFRICA, 2016**

A key characteristic of most differentiated care approaches is the expansion of care beyond secondary and tertiary health centres into community settings. In 2016, 25 of 118 reporting countries had a national policy promoting community delivery of antiretroviral therapy, including 40% of reporting countries in eastern and southern Africa.

Source: 2017 National Commitments and Policy Instrument.

The drive to achieve the 90–90–90 targets has stimulated a wave of innovation, stretching from grass-roots actors to the world’s leading scientific laboratories. HIV test kits have become simpler and easier to use, HIV medications are increasingly affordable, durable, effective, tolerable and easy to take, and viral load results can be delivered at the point of care. At the same time, strategies to encourage people to learn their HIV status, initiate antiretroviral therapy and achieve durable viral suppression have become increasingly sophisticated and adaptable to a range of settings. The concept of differentiated care has emerged from pioneering efforts that engage communities and bring quality services to their homes and villages. An increasing number of countries are using the differentiated care model to establish community-based systems for providing services across the cascade and making the 90–90–90 targets a reality.

### COUNTRIES ADOPTING THE TREAT ALL GLOBAL STANDARD



**FIGURE 4.2. RECOMMENDED ANTIRETROVIRAL THERAPY INITIATION THRESHOLD AMONG PEOPLE LIVING WITH HIV PER MINISTRY OF HEALTH GUIDELINES, BY COUNTRY, GLOBAL, MID-2017**

Drawing on the rapidly growing body of data demonstrating the clear preventive and therapeutic effects of early antiretroviral therapy, the World Health Organization (WHO) recommended in 2015 that antiretroviral therapy should be initiated in every person living with HIV at any CD4 cell count. Among the 194 countries that reported information to WHO and UNAIDS, 123 of them—including 29 of 35 Fast-Track countries—had adopted this treat all approach within their national HIV treatment guidelines. Among the remaining reporting countries, eight continue to limit treatment to people living with HIV who have a CD4 count of 350 cells/mm<sup>3</sup> or lower.

Source: World Health Organization, 2017.

### LINKING SELF-TESTERS TO TREATMENT



**FIGURE 4.3. PROPORTION OF HIV SELF-TESTERS WHO INITIATED TREATMENT FOLLOWING A REACTIVE SELF-TEST, ZIMBABWE, 2016-2017\***

HIV self-testing, which enables users to learn their HIV status by themselves in private, could play a pivotal role in reaching the first 90. The result of a self-test is not a diagnosis, however, and an important challenge is linking an individual with a reactive self-test to a confirmatory diagnosis and HIV treatment initiation. The UNAIDS-supported Self-Testing Africa (STAR) project, led by Population Services International (PSI) in partnership with the World Health Organization (WHO), is addressing this problem. During the first year of the project, 80% of reactive male self-testers in Zimbabwe initiated HIV treatment, compared to 51% among men who received reactive tests through provider-delivered, community-based testing. Among women, the proportion of reactive testers initiating HIV treatment was equivalent between the two testing options.

Source: STAR project, 2017.

\* Proportion linked to care following HIV self-testing is based on the total number of reactive HIV self-test results over the total number of self-testers with a reactive test result, who were linked to a health facility for both confirmatory testing and treatment from March 2016 to May 2017. Comparative data is based on PSI Zimbabwe programmatic data from January to October 2016.



## DIFFERENTIATED CARE: A CLIENT-CENTRED PATH TO THE 90-90-90 TARGETS

More than a century ago, innovators within the retail industry found that improving quality and building trust among their customers increased sales. A customer-oriented approach developed around the slogan “the customer is always right,” and an emphasis on customer satisfaction soon became the industry norm (1).

Similarly, there is increasing recognition that poor-quality health care is undermining efforts to reach global health goals: when the quality of care is poor, increasing the availability of health services leads to health outcomes that are below expectations, and unsatisfied people are less likely to support public financing of health care (2). Improving the quality of HIV services and adapting them to the varying needs of people at risk of HIV infection and people living with HIV is thus at the heart of the concept of differentiated care.

Differentiated care is a client-centred approach that simplifies and adapts HIV services across the cascade to better serve the needs of people living with HIV and increase the efficiency of the health system (3). Differentiated care incorporates concepts such as simplification, task shifting and decentralization, which facilitate more effective allocation of resources, provide better access to services for underserved populations and deliver care in ways that improve quality of care and life. The *Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection*, released by the World Health Organization (WHO) in 2016, include service delivery recommendations based on a differentiated care framework (4).

Differentiated care is also a rights-based approach that can help reduce stigma and discrimination, even when the rights of individuals are not formally recognized in laws (5). WHO’s 2017 *Consolidated guidelines on person-centred HIV patient monitoring and case surveillance* take an overtly person-centred approach, focusing HIV data around the person who needs care rather than on separate service areas; they also tackle security and confidentiality issues around data (6).

Much of the learning on differentiated HIV care has been derived from pioneering service models developed by communities. For example, community distribution of antiretroviral medicines has proven highly effective in expanding the reach of HIV treatment programmes and improving their outcomes. In Uganda, The AIDS Support Organization (TASO) delivers medicines to local villages or towns, reducing burdens on patients associated with medication refills and increasing rates of retention in care (7). Similar results have been reported in Malawi following the establishment of community treatment groups, which reduced the number of antiretroviral refill visits to health facilities by 59% without a single reported episode of theft or loss of medicines (8).

A key characteristic of most differentiated care approaches is the expansion of care beyond secondary and tertiary health centres into community settings. In 2016, 25 of 118 reporting countries had a national policy promoting community delivery of antiretroviral therapy, including 40% of reporting countries in sub-Saharan Africa (Figure 4.1). In 2017, the latest findings from two ongoing clinical trials supported by the United States President’s Emergency Plan for AIDS Relief (PEPFAR)—Sustainable East Africa Research in Community Health (SEARCH) and HPTN 071 (PopART)—underscored the capacity of community-centred approaches to generate dramatic gains across the 90-90-90 continuum.<sup>1</sup> After just two years of service delivery, SEARCH has achieved the 90-90-90 targets in the rural communities in Kenya and Uganda that it serves (see Chapter 1). Similarly, two rounds of community service delivery in the Zambian communities within the HPTN 071 (PopART) trial has raised knowledge of HIV status and coverage of antiretroviral therapy to levels that nearly reach the first and second 90s (see box).

### Expanding community-based and community-led services

The hands-on involvement of community-based organizations and community health workers is a hallmark of successful AIDS responses, enabling public health systems to deliver HIV services more widely and equitably (14, 15). In the SEARCH trial, elected village leaders successfully planned and conducted a six-day multidisease health campaign with service provision by local clinic staff that reached over half of the inhabitants of a rural Ugandan community (16). As well as expanding access to HIV prevention and testing services, linking those who have been newly diagnosed to treatment and improving retention in HIV care, community-based organizations provide broader health and other services, including legal literacy, legal aid and social care (17, 18).

These innovative service models also are enhancing the efficiency of programmes, allowing them to deliver greater results with similar levels of financial and human resources. In Zambia, for example, the move to a greater use of community service delivery is helping lower the costs of treatment programmes, contributing to a 32% decline in per-patient treatment costs compared to facility-based services (19).

An important reason to invest in community-based services is that far too many people living with HIV, especially in rural areas, do not have a convenient service option nearby. For individuals who do not live close to HIV testing services, learning one’s HIV status may involve indirect costs that function as a deterrent to HIV testing uptake (20). For instance, studies in South Africa have found that HIV service utilization declines as the distance to the nearest health facility increases (21). Similarly, individuals surveyed in Johannesburg responded that they were significantly less likely to access rapid HIV testing services when the nearest services were more than 30 kilometres from their home (22).

<sup>1</sup> “PopART” is shorthand for “Population Effects of Antiretroviral Therapy to Reduce HIV Transmission.”

## HPTN 071 (POPART): RAPID PROGRESS TOWARDS THE FIRST TWO 90S THROUGH A COMMUNITY-CENTRED APPROACH

HPTN 071 (PopART) is a cluster-randomized trial being conducted in 21 urban communities in South Africa and Zambia that have a total population of about 1 million people. Under the study protocol, two thirds of the communities receive community-based services from community HIV care providers. These community care providers conduct annual rounds of a combination HIV prevention package that includes home-based voluntary HIV testing and counselling; they also support linkages to care and treatment retention for all people living with HIV in the communities. Additional services delivered by the HIV care providers include distributing condoms, screening for sexually transmitted infections and tuberculosis, and promoting voluntary medical male circumcision for HIV-negative men and services to prevent mother-to-child transmission for women living with HIV (9).

After one round of service delivery in four Zambian communities, knowledge of HIV status rose from 52% to 78% among men living with HIV and from 56% to 87% among women living with HIV. The proportion of people accessing antiretroviral therapy increased from 54% to 74% among men and from 53% to 73% among women (9).

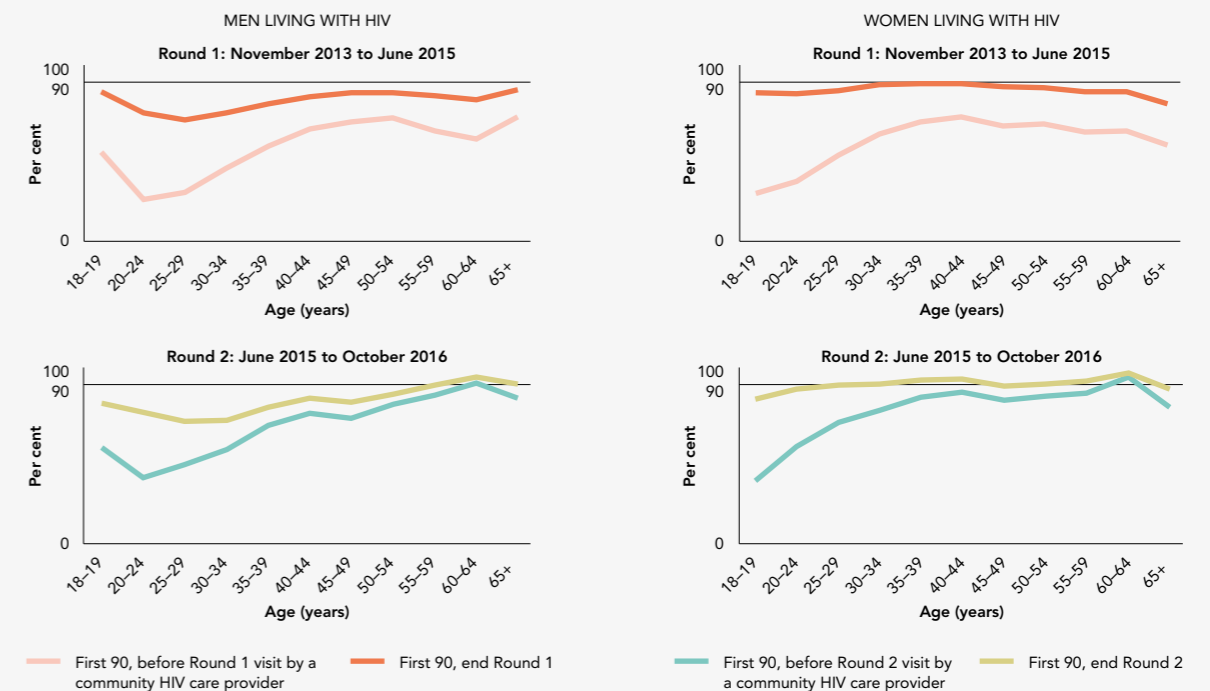
Of particular note within these impressive gains is how the community-based services have closed the considerable gaps in knowledge of HIV status among young people living with HIV. For example, knowledge of HIV status among those aged 20–24 years living with HIV increased sharply, from 24% to 73% among the men and from 34% to 84% among the women (10). Antiretroviral therapy coverage among the same group also increased, improving from 22% to 50% among the men and from 26% to 56% among the women. While this was a large increase, the level of coverage was still considerably lower than the approximately 80% coverage among men aged 40 years and older and among women aged 35 years and older (10).

Results during the first annual round also underscored a common challenge faced by community-based approaches to HIV testing and treatment: delays in the initiation of treatment after an HIV diagnosis. Rapid linkages to care—within the same day, if possible—are easiest when individuals are diagnosed in clinics or other settings that are in close proximity to a health facility that provides antiretroviral therapy. In community-based HIV testing, however, diagnosis often occurs far away from the nearest treatment provider. As a result, about 40% of people diagnosed with HIV during the first round of the trial in Zambia reported that they had initiated treatment within six months of referral, with the median time being 11 months.

During the second annual round of service delivery, however, adjustments were made and even greater progress was achieved: knowledge of HIV status among people living with HIV increased to 78% among men and 90% among women (11). Community HIV care providers increased their focus on linkages to care, including by verifying treatment initiation among their clients diagnosed with HIV and by improving coordination with health clinics providing treatment (12). As a result, about 60% of people diagnosed with HIV reported they had initiated treatment within six months of referral, and the median time was reduced to four months (13). Estimates of people accessing antiretroviral therapy increased to 80% for both men and women, although coverage was lower among those whose first participation in the programme was during the second round of service delivery, highlighting the importance of annual visits in urban communities with high rates of mobility and in-migration (11).

### HPTN 071 (POPART) TRIAL: REACHING THE FIRST 90

KNOWLEDGE OF HIV STATUS BEFORE AND AFTER COMMUNITY-BASED SERVICES



### HPTN 071 (POPART) TRIAL: REACHING THE SECOND 90

ANTIRETROVIRAL THERAPY COVERAGE BEFORE AND AFTER COMMUNITY-BASED SERVICES



FIGURE 4.4. KNOWLEDGE OF HIV STATUS AND ANTIRETROVIRAL THERAPY COVERAGE, BY AGE AND SEX, HPTN 071 (POPART) TRIAL COMMUNITIES BEFORE AND AFTER TWO ROUNDS OF SERVICE DELIVERY, ZAMBIA, 2013-2016

Source: Hayes R, Floyd S, Schaap A, Shanaube K, Bock P, Sabapathy K et al. A universal testing and treatment intervention to improve HIV control: one-year results from intervention communities in Zambia in the HPTN 071 (PopART) cluster-randomised trial. *PLoS Med.* 2017;15(5):e1002292. Hayes R, Floyd S, Schaap A, Shanaube K, Bock P, Griffith S et al. Reaching 90–90–90? Findings after two years of HPTN 071 (PopART) intervention in Zambia. Conference on Retroviruses and Opportunistic Infections (CROI), 13–16 February 2017, Seattle. Poster Number 1011.

Community-based organizations also are important for providing essential HIV services to key populations (23–26). Prevention programmes built around strong community involvement in a wide range of countries and epidemic settings have been shown to reduce HIV risk among people who inject drugs, female sex workers and their clients, and gay men and other men who have sex with men (26–32). In many settings, community-based organizations and nongovernmental organizations are the only groups capable of effectively reaching marginalized key populations with HIV services, including condom distribution and linkages to pre-exposure prophylaxis (PrEP), voluntary medical male circumcision, HIV testing and treatment. In recognition of the central roles played by community involvement, the global commitment to people-centred systems for health that is expressed in the 2016 United Nations Political Declaration on Ending AIDS includes a specific target for expanding community-led service delivery to cover at least 30% of all service delivery by 2030.

Reaching this target will require the integration of community responses into national AIDS plans and budgets. Community-based organizations should not be treated as donor-funded substitutes for inadequately resourced public health systems; rather, they function best alongside and in concert with the rest of the public health system. Structured support from the public health system—including training, funding and supervision—is essential to boost the impact, quality and sustainability of community-led services. Investments in community service delivery enhance the reach, impact and efficiency of service delivery and are essential for achieving the 90–90–90 targets. In particular, community health workers have a unique ability to engage hard-to-reach clients. For example, while community-based testing services only accounted for 0.7% of all tests administered in China in 2015, they identified 30% of new HIV diagnoses (33).

Funding for community-led HIV services is broadening, but there is room for improvement. Of 108 reporting countries in 2016, 68 stated they had laws, policies or regulations allowing community-based and other civil society organizations to access funding from international donors. Only 41 countries, however, reported the existence of social contracting or other mechanisms that allowed funding of service delivery by communities from domestic sources.

# MELBOURNE

## CITY CASE STUDY

The Australian city of Melbourne joined the Fast-Track cities initiative in December 2015 as part of the State of Victoria's commitment to achieve the 90–90–90 targets by 2020. A year later, Victoria reported that it had reached the targets: among people living with HIV in the state, 90% had been diagnosed, 84% were on antiretroviral therapy and 78% were virally suppressed.

Melbourne's success stems from momentum built by Victoria's AIDS response over decades. Like Australia's national response, the state's response is designed and delivered in collaboration with affected communities, clinicians and researchers. The model supports flexible new approaches—such as targeted HIV testing through local primary and community care services—and it can adapt to rapidly changing science and technology.

The peer-led and community-based project PRONTO! is an example of this successful approach. Established by the Victoria AIDS Council and partners in 2013, it provides free, rapid (15-minute) HIV tests—along with tests for chlamydia, gonorrhoea and syphilis—and it supplies assistance with referrals to other services, including PrEP. Over 5500 people have used PRONTO!.

Another innovation used in Melbourne is Test and Go (TAG), a nurse-led rapid HIV and sexual health testing service for gay men and other men who have sex with men. Community mobilization is also being used to popularize frequent testing, including through the high-visibility social marketing drive, the Drama Down Under campaign.

*Programme description and data were provided to UNAIDS by Andrea Fischer, Peter Doherty Institute of Infection and Immunity, 5 May 2017.*



## REACHING THE FIRST 90

Important progress has been made towards the first 90: in 2016 more than two thirds of people living with HIV globally knew their HIV status. Closing the gap requires making HIV testing a greater priority and taking full advantage of new technologies and innovative service strategies.

### HIV self-testing

HIV self-testing, which enables users to learn their HIV status by themselves in a private setting, is an under-utilized testing option that could play a pivotal role in reaching the first 90. Rapid roll-out and promotion of self-testing is one of several strategies for moving the locus of testing from health facilities to community settings.

Studies have found HIV self-testing to be highly acceptable; ease of use, self-empowerment and guaranteed confidentiality are often cited as its most appealing aspects (34, 35). It has the potential to greatly increase HIV testing utilization among populations that are not currently reached by facility-based testing services (including men, young people and key populations) and to improve the efficiency of testing services by reducing burdens on health facilities and health-care providers (36, 37).

The simplicity and built-in privacy that is intrinsic to self-testing enables a range of novel and potentially low-cost distribution models, including through community-based lay distributors. Self-testing also has the potential to increase uptake among HIV-negative self-testers of HIV prevention services, such as voluntary medical male circumcision. In Zimbabwe, recent modelling suggests that attainment of the first 90 in that country will require the introduction of community-based HIV self-testing focusing on young people, adult men and female sex workers (38). In Botswana, the national strategy to reach the first 90 envisages nearly half of all HIV tests performed in the country in 2020 being self-tests (39).

In 2016, WHO formally recommended the implementation and scale-up of HIV self-testing (40). Four HIV self-testing platforms approved by a stringent regulatory authority are currently on the market globally and a number of additional products are in development (41). As of July 2017, 40 countries had policies supportive of HIV self-testing, with 13 reporting they are actively implementing HIV self-testing; an additional 48 countries reported they are developing national HIV self-testing policies (41). Cities participating in the Fast-Track Cities initiative also have been urged to support the widespread availability of quality-assured, affordable HIV self-tests for everyone, with a focus on vulnerable populations (42). With appropriate supporting policies and market-shaping interventions, it is projected that HIV self-testing could quickly come to occupy a substantial proportion of the HIV testing market, potentially reaching 25 million test kits distributed annually (36).

Translating the potential of HIV self-testing into reality requires the establishment of a viable market, with diverse outlets distributing and marketing quality-assured products at a price that people at risk of HIV infection are willing to pay. Currently, considerable variation in the prices of self-testing kits is a challenge: as of June 2017, the price for approved kits in high-income countries ranged from US\$ 8 to US\$ 48, although lower prices are now being offered for public health use, particularly in low- and middle-income countries (43). Stable lower prices are expected as the market for self-testing increases in low- and middle-income countries.

The UNITAID-supported Self-Testing Africa (STAR) project, led by Population Services International (PSI) in partnership with WHO, is working to develop the HIV self-testing market.<sup>2</sup> The project has distributed nearly 380 000 HIV self-test kits in 27 districts in Malawi, Zambia and Zimbabwe during the 12-month first phase of a four-year project. Strategies used by the project include door-to-door distribution through lay community-based distribution agents working with their local communities, peer distribution for female sex workers, workplace distribution focusing on men, use of HIV self-testing as part of demand creation for voluntary medical male circumcision, and facility-based distribution that includes efforts to reach the sexual partners of pregnant women, people living with HIV and other priority groups. All kits are distributed free of charge.

Early results indicate that STAR is effectively reaching many people who do not seek HIV tests in health facilities. Among users of self-tests, 26% in Malawi, 21% in Zambia and 23% in Zimbabwe were first-time testers (44). Preliminary results also indicate that self-tests are helping to close gaps related to knowledge of HIV status among young people and men: over the first year, young people (aged 16–24 years) comprised 26% of self-test users in Malawi, 21% in Zambia and 28% in Zimbabwe, and in the project areas, testing coverage among that group increased by 24% in Malawi, 17% in Zambia and 39% in Zimbabwe (Figure 4.5) (44). Men (aged 16–65 years) accounted for 49% of self-test users in Malawi, 51% in Zambia and 44% in Zimbabwe, and testing coverage among men in the project areas increased by 24% in Malawi, 21% in Zambia and 28% in Zimbabwe (44).

### SELF-TESTING REACHING YOUNG PEOPLE AND MEN

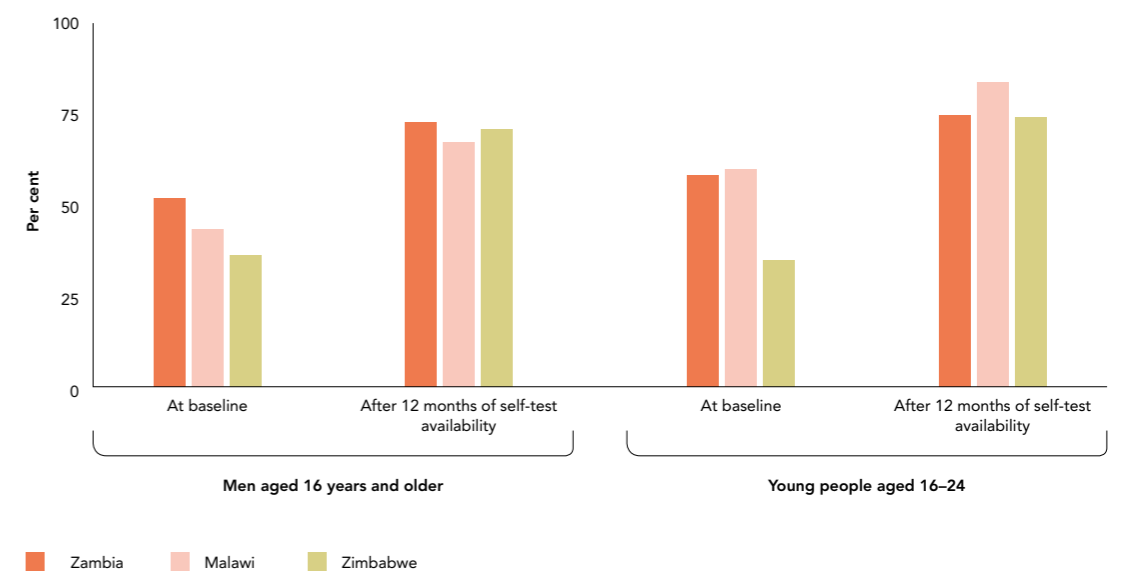


FIGURE 4.5. TESTING COVERAGE, MEN (AGED 16–65 YEARS) AND YOUNG PEOPLE (AGED 16–24 YEARS), BASELINE AND AFTER 12 MONTHS OF SELF-TEST AVAILABILITY, STAR SELF-TESTING PROJECT, MALAWI, ZAMBIA AND ZIMBABWE, 2016–2017

Source: STAR project, 2017.

<sup>2</sup> The STAR consortium includes UNITAID, PSI, WHO, London School of Hygiene and Tropical Medicine, Liverpool School of Tropical Medicine and University College London.

The STAR project is also tackling a common challenge with HIV self-testing: linkages to a confirmatory diagnosis and HIV treatment. WHO guidelines on self-testing stress that a reactive (positive) self-test result always requires further testing and confirmation from a trained tester using a validated national testing algorithm. The STAR self-testing initiatives and the kits themselves include clear messages that ensure users understand that a self-test does not provide a definitive HIV-positive diagnosis (40). In addition to that information, self-testing kits distributed by STAR include self-referral cards that provide a named focal contact at a local health facility. Local kit distributors also are trained to provide encouragement, support and referral. Trials with financial incentives and optional post-test home follow-up visits are also being conducted.

During the first year of the STAR project, 80% of reactive male self-testers in Zimbabwe initiated HIV treatment, compared to 51% among men who received reactive tests through provider-delivered, community-based testing (44). Among women, the proportion of reactive testers initiating HIV treatment was equivalent between the two testing options.

#### **Assisted partner notification**

WHO has recommended couples and partners testing, including support for mutual disclosure, since 2012. Despite this, its inclusion in the HIV policies of many countries has not often been actively prioritized or widely implemented (40). A particularly effective approach is assisted partner notification, where consenting newly diagnosed clients are assisted by a trained provider to disclose their status or anonymously notify their partners of their potential exposure to HIV infection. Partners are then offered HIV testing (40). A strong body of evidence shows that assisted partner notification services can increase uptake of HIV testing services among partners of HIV-positive individuals; they also can result in high proportions of HIV-positive people being diagnosed and increased linkages to care among partners of HIV-positive individuals (40).

Reported instances of social harm and other adverse events following HIV partner notification using passive or assisted approaches have been rare (40). Nonetheless, programmes should take measures to ensure partner notification services are always voluntary and that notification is only delivered to partners of people living with HIV. Criminal justice, law enforcement or providers of services not related to health should not be involved in partner notification services. Countries should review their laws and policies in order to consider how they could be more supportive of people with HIV: for example, they could revise mandatory or coercive partner notification practices that may stigmatize, criminalize or discriminate against people from key population groups and people living with HIV (40).

#### **Early infant diagnosis**

Identifying HIV-exposed infants at their six-week immunization visit and clearly informing mothers during antenatal care about infant testing has been shown to increase early infant diagnosis (45). Countries such as Botswana, Namibia and South Africa have implemented more effective follow-up of HIV-exposed infants until a definitive diagnosis can be made at 18 months of age. The use of customized text message alerts for mothers also has been shown to increase entry and retention of HIV-exposed infants in care (46).

The emergence of point-of-care early infant diagnostic testing has the potential to substantially increase timely diagnosis of HIV-exposed infants and improve linkages to paediatric HIV treatment. Same-day test results and treatment initiation decrease the chance of loss to follow-up and help retain infants in care. In Mozambique, infants who were diagnosed at point-of-care facilities were seven times more likely to start antiretroviral therapy than those diagnosed through a standard laboratory test; they also started treatment earlier and were less likely to be lost to follow-up (47). In Malawi, more than 90% of infants diagnosed at the point of care initiated antiretroviral therapy within 12 months, compared to less than half (46%) of those tested through specimen transport to centralized laboratories (48). The turnaround time from sample collection to treatment initiation in these instances was less than one day for point-of-care diagnosis (compared to 40 days for conventional diagnosis) (48).

Procurement of point-of-care early infant diagnostic tests increased 21-fold from 2014 to 2017 as more and more countries moved from pilot projects to scale-up, but point-of-care tests remain a small fraction of HIV tests for infants (49). The higher cost of point-of-care tests may discourage scale-up, but when taking into account the much greater proportion of infants living with HIV who successfully initiate antiretroviral therapy after a point-of-care test, the actual cost may be equal to or lower than conventional testing at centralized labs (49).

Another opportunity for accelerating progress in early infant diagnosis is the adoption of virological testing at birth (50). In settings with a high proportion of attended deliveries, adding virological testing at birth to the existing testing algorithm can enable an earlier and wider provision of HIV testing services to mothers and babies who may not return to the health facility (51). A number of operational issues remain to be resolved, however, such as the need for additional human resources, active tracking of infants tested and messages that guarantee uptake of repeat testing at six weeks. It is also important to strengthen the overall uptake, retention and linkages in the testing-to-treatment cascade for birth testing to have the expected impact. After South Africa introduced virologic testing at birth and at 10 weeks for all HIV-exposed infants in 2015, the number of HIV-exposed infants receiving virologic testing within seven days of birth increased 15-fold in only three months, while the number of HIV-diagnosed children rose more than sixfold (52). A number of countries—including Ghana, Kenya, Namibia, Swaziland and Zimbabwe—are in the process of undertaking pilots of virological testing at birth to inform future national scale-up.

## **REACHING THE SECOND 90**

More than half of all people living with HIV (53% [39–65%]) were accessing antiretroviral therapy in 2016. The world must maintain the current pace of scale-up in antiretroviral therapy uptake in order to reach the second 90 of the 90–90–90 targets and at least 30 million people accessing treatment by 2020. Adoption of a treat all approach and same-day initiation, along with increasing investment in scaled-up community-based strategies, will be critical to success. This will require rapidly expanding proven models for linking newly diagnosed individuals to care and refining clinic operations to improve efficiency, empower clients and expedite treatment uptake. Lessons from the remarkable results achieved by SEARCH and HPTN 071 (PopART) also must be considered, including the strategic use of trained community health workers and a holistic approach that treats not only HIV but the full health needs of client.

### Adopting best practices for linkages to care

Results from recent clinical trials have underscored the fact that many people who are diagnosed with HIV are not rapidly linked to treatment and care (11, 21). Interventions that streamline care (such as linking individuals to clinical care at the same site and on the same day they receive their test results) or offering integrated services (such as for HIV and tuberculosis) generally achieve superior rates of linkages to care (53). Study results from rural Kenya released in 2017 found that administering point-of-care CD4 tests by lay providers alongside HIV testing and counselling increased linkages to care within six months of a positive HIV test from 34% (using lab-based CD4 testing) to 58% (54).

A growing body of evidence from a variety of settings and epidemic contexts—including Canada, Haiti, the United States of America and South Africa (55–58)—shows that initiating antiretroviral therapy on the same day as diagnosis reduces gaps across the 90–90–90 continuum. Same-day initiation of HIV treatment is most feasible in clinical settings where both HIV testing and treatment services are offered. For other testing programmes—such as community-centred testing—streamlined referrals, navigation support and firm linkages between service providers are needed to facilitate same-day initiation.

### Rapid roll-out of new and improved antiretroviral medicines

Over the last several years, new antiretroviral medicines have been validated as superior to those currently in use. Particular optimism has greeted the emergence of dolutegravir, an integrase inhibitor that more rapidly suppresses viral load, has fewer side effects and is less prone to resistance (59). In addition, the dose is much smaller (50mg compared to 600mg for efavirenz), which means that dolutegravir has the potential to be much cheaper to produce, lowering treatment costs and making treatment programmes more sustainable (60, 61). The Clinton Health Access Initiative estimates that rapidly manufacturing dolutegravir and other emerging antiretroviral medicines and incorporating them into first-line regimens could reduce the average cost of first-line fixed-dose regimens by nearly half (62). Botswana introduced a fixed-dose combination that included dolutegravir as the country's first-line regimen in 2016 (63).

Introduction of ritonavir-boosted lopinavir (LPV/r) pellets has now enabled better treatment for infants and young children. Cameroon, the Democratic Republic of the Congo, India and Uganda have started national roll-out of the pellets, and Malawi, Nigeria, Swaziland and Zimbabwe are currently piloting the use of this formulation (64). The Paediatric HIV Treatment Initiative is working to accelerate development and introduction of other paediatric antiretroviral medicines in age-appropriate formulations, with dispersible paediatric tablets (including dolutegravir) among the products expected to be submitted for regulatory approval in 2019 (64).

### Sustained efforts to ensure the affordability of antiretroviral medicines

Although important progress has been made in improving access to medicines for people living with HIV, insufficient availability and poor affordability of essential medicines in low- and middle-income countries—including the medicines required for treatment of HIV-related coinfections and comorbidities—remain major barriers. Actions focused on the intersections between intellectual property rights, innovation and public health are vitally important for resolving market failures in medicine development and

manufacture, unmet needs for research and development, and pricing. This is especially true in light of the concentration of the generic pharmaceutical industry in India and the global AIDS response's continued reliance on the Indian industry, which supplied nearly 90% of antiretroviral medicines in low- and middle-income countries in 2015 (65). In 2016, the United Nations Secretary-General's High-Level Panel on Access to Medicines recommended continued efforts to promote the use of the existing flexibilities provided by the World Trade Organization's Trade-Related Aspects of Intellectual Property (TRIPS) agreement and stronger political support for new models of financing research and development that delink innovation from the final price of health products (66).

## REACHING THE THIRD 90

An estimated 44% [32–53%] of people living with HIV globally were virally suppressed in 2016. Although most people accessing antiretroviral therapy obtain excellent clinical outcomes, important opportunities exist to improve rates of viral suppression. It is critical for treatment programmes to establish strategies and systems that support patient adherence to treatment and reduce the number of patients lost to follow-up. Expansion of viral load testing for each person accessing treatment will allow for more precise monitoring of both individual and community viral loads.

### Increase retention in care

Discontinuity of care—also known as loss to follow-up—is a major reason why people receiving antiretroviral therapy do not achieve or maintain viral suppression. Treatment programmes should implement both proven strategies to increase retention and community-level interventions to enhance retention (4). Community-centred strategies that use peers and trained community health workers generally achieve retention rates and treatment outcomes that are comparable—or even superior—to those reported by mainstream health facilities, further underscoring the need to increase community service delivery (15, 67–69). In one district in Uganda, the inclusion of expert patients within a multidisciplinary clinical team was found to successfully re-engage 79% of people living with HIV who had previously been lost to follow-up (70). Mobile phone text messages using the short message service (SMS) are also feasible and affordable means of improving adherence (71).

The use of peer support groups, well-trained and supportive health workers, and reduced waiting times at clinics also have been shown to increase retention among adolescents and young people living with HIV. In a study in 10 districts in Uganda, these strategies were important factors in achieving an adherence rate of 95% or better among nine out of 10 adolescents (aged 10–19 years) (72). Other studies confirm that adolescents and young people are less likely to drop out of care when they attend clinics that have peer support groups or that provide sexual and reproductive health services (73, 74).

Also promising is a community cohort care model that offers adolescents and young people a range of services in a group setting in the community. When tested in Haiti, this model led to quicker initiation of antiretroviral therapy and significantly improved retention in care compared with standard clinic-based care (75). The use of mobile phone technology, social marketing and support for social networking could improve adherence among young people within key populations (76).

## Expanding viral load testing

Viral load testing is the preferred means of monitoring people accessing antiretroviral therapy. WHO recommends performing a viral load test within six months of a patient initiating antiretroviral therapy, again at 12 months and then at least every 12 months thereafter in order to detect treatment failure and then switch the patient to regimens in order to suppress viral load (4).

Based on surveys of seven clinical sites in eastern and southern Africa, Médecins Sans Frontières (MSF) has proposed strategies to increase uptake of routine viral load monitoring. These steps include having a viral load focal person to identify those in need of a viral load test, systems in place to flag patients who need a test and reforms to clinic operations (such as implementing a patient triage system and enhancing patient flow) (77). Patient education and demand creation initiatives are essential to effective scale-up, and facilitating same-day results for viral load tests and having on-site physicians who are empowered to authorize a new regimen allows regimens to be changed more rapidly when patients show signs of treatment failure (77).

Point-of-care technologies offer further potential to expand viral load testing (4). With point-of-care testing, delays in the return of test results can be averted, enabling clinicians to identify and address adherence challenges and treatment failure even sooner. Particular attention has been focused on the GeneXpert assay, a platform in wide use for the detection of tuberculosis and drug resistance to rifampin among tuberculosis patients. Recent evaluations have found that the GeneXpert HIV viral load platform yields results comparable to standard viral load assays performed by centralized laboratories (78). Several countries in Africa are piloting or planning to introduce GenXpert instruments for HIV viral load and early infant diagnosis.

## ADDRESSING STIGMA AND DISCRIMINATION

The highest attainable standard of health is a fundamental right of every person (79). Despite this, stigma and discrimination continue to undermine public health generally and the AIDS response specifically (80, 81). Stigma and discrimination at health-care facilities discourage people from using services that can protect their health and well-being, including HIV testing and treatment (82, 83).

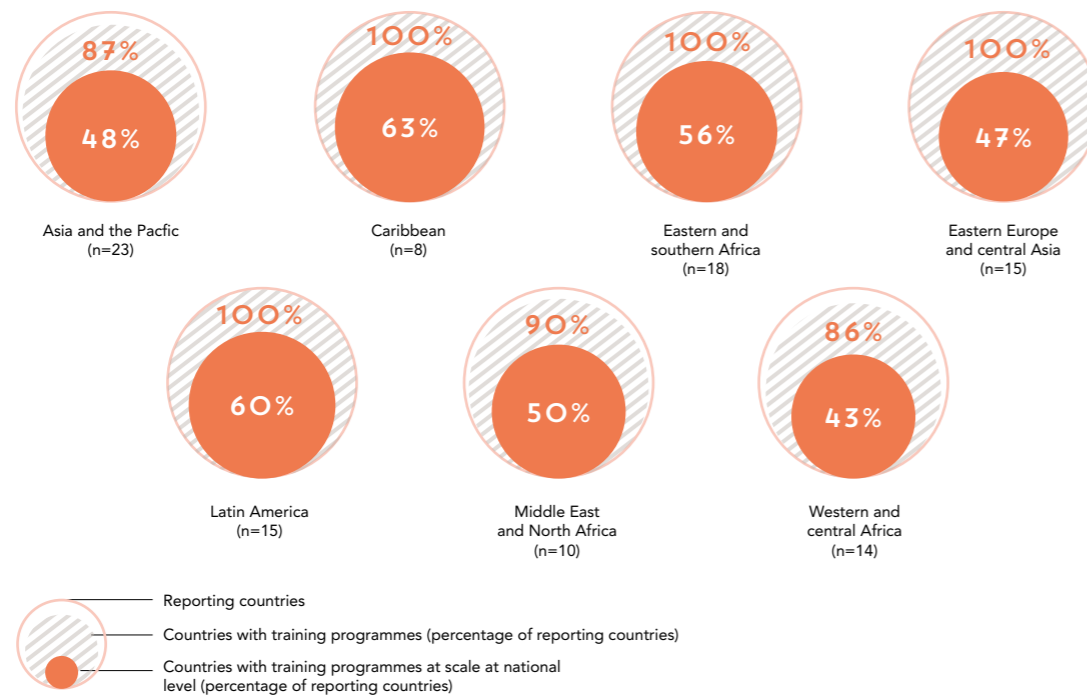
Reaching the 90–90–90 targets and ultimately ending the AIDS epidemic requires specific efforts to address stigma, discrimination and human rights violations at all levels, including the creation of a protective and empowering legal environment and strong rule of law. Service providers must know their obligations and be sensitized in order to reduce discrimination and stigma; key populations and people living with HIV must be aware of their rights and have the skills and knowledge to enforce them; legal systems (including courts), monitoring bodies, ombudsmen, judges and police must be accessible and function without discrimination or stigma; and legal services—such as legal aid, paralegals and pro bono services—are needed to provide advice and representation that is available and affordable.

With the growing recognition that rule of law is a powerful determinant of health and the inclusion of access to justice within the Sustainable Development Goals, there has been a significant increase in actions to prevent discrimination against key populations and people living with HIV (84, 85). Some countries have introduced laws that explicitly protect people from discrimination on the grounds of sexual orientation, gender identity or HIV status, both in health settings and more broadly (86). Thailand, for example, is among the many countries with explicit policies or national AIDS strategies that set the reduction of HIV-related stigma and discrimination as a central goal, focusing in particular on reducing discrimination against key populations and people living with HIV (87).

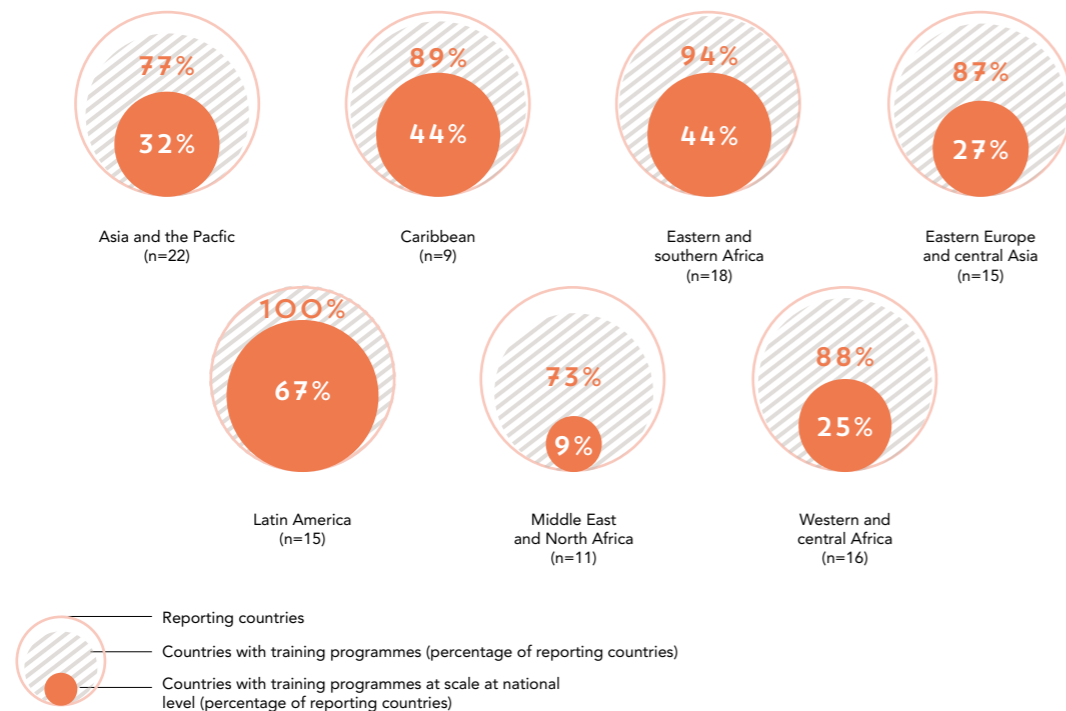
There is often, however, a significant gap between law and implementation. In 2016, 93 countries reported the existence of accountability mechanisms for dealing with discrimination and rights violations in health-care settings, but in one third (30 of 93) of those countries, civil society and nongovernmental partners reported that the mechanisms were not functioning in 2016. In more than 75% (70 of 93) of the responding countries, limited awareness or knowledge of how to access the accountability mechanisms diminished their usefulness, and affordability for people from marginalized and affected groups was a hindrance in almost 41% (38 of 93) of them.

Training and awareness-raising among service providers is crucial to reducing discriminatory attitudes and behaviours. In response, countries are expanding training schemes for duty bearers and health-care providers to reduce stigma and discrimination in health facilities. Almost all reporting countries in 2016 (101 of 108) indicated they had training programmes for health-care workers on human rights and nondiscrimination legal frameworks as they apply to HIV (Figure 4.6). In almost half of those countries (46 of 101), however, the interventions were either small-scale or isolated activities.

**TRAINING FOR STIGMA AND DISCRIMINATION REDUCTION**



**FIGURE 4.6. PERCENTAGE OF COUNTRIES WITH TRAINING PROGRAMMES FOR HEALTH-CARE WORKERS ON HUMAN RIGHTS AND NON-DISCRIMINATION LEGAL FRAMEWORKS AS APPLICABLE TO HIV, BY REGION, 2016**



**FIGURE 4.7. PERCENTAGE OF COUNTRIES THAT HAVE HAD TRAINING AND/OR CAPACITY-BUILDING ON HIV-RELATED RIGHTS FOR PEOPLE LIVING WITH HIV AND KEY POPULATIONS IN THE PAST TWO YEARS, BY REGION, 2016**

Source: 2017 National Commitments and Policy Instrument.

Ending stigma and discrimination is also heavily dependent upon rights holders knowing their rights and how to hold institutions and service providers to account. This is especially important for individuals who are particularly vulnerable to rights abuses. In 2016, 96 countries provided at least some training to educate people on HIV and rights, but 15 countries offered no such training. Over 70% of reporting countries in all regions stated they had provided training or capacity-building on HIV-related rights for people living with HIV and key populations in the previous two years (Figure 4.7). In eastern and southern Africa, Latin America and the Caribbean, at least 40% of reporting countries indicated that their programmes were national in scale.

Accessible procedures and institutions (such as ombudspersons and tribunals), clear procedures and mechanisms for monitoring abuses, and legal aid or pro-bono legal services are needed to enforce protective laws and provide redress when people’s rights are violated. In 2016, 78 countries had procedures for lodging complaints about discrimination or rights violations in health-care settings; of those, 39 reported having mechanisms of redress in place.

Partnerships forged between health providers, legal professionals and law enforcement officials can improve people’s access to justice (88). The Kenya Hospices and Palliative Care Association, for example, has been training health-care workers as paralegals to identify legal issues, provide legal advice and refer people to pro bono lawyers (89). In South Africa, sex workers are being trained to act as paralegals, and mobile legal aid clinics staffed by paralegals operate in the Gambia (89, 90).

New communication technologies also offer exciting opportunities. For example, text messaging is being used in Burundi, Côte d’Ivoire, Haiti and Malawi to rate people’s experiences at health facilities, and it has proved effective in strengthening retention in HIV care (91). The same technologies can be used to report and document experiences of discrimination. In Ghana, text messaging and a website are being used to gather complaints about discrimination experienced by people living with HIV and key populations (92). Virtual legal consultations are being offered in Ukraine (93), and Barefoot Law, a legal aid start-up in Uganda, provides legal consultation via various social media platforms (94). In Mali, Association Deme-So has set up phone lines that link its paralegal network via free text messages (95).

iMonitor+ is another exciting digital tool that was developed through a public-private partnership in Thailand. Based on an app for smartphones, the tool enables users to receive or send information on subjects such as stock-outs of medicines, HIV treatment complications or their experiences at health facilities. iMonitor+ has been used in Kenya and South Africa to facilitate access to legal services, as well as in Botswana, Indonesia, the Philippines and Thailand (96).



# CAPE TOWN

## CITY CASE STUDY

Supporting and advancing the rights of sex workers who are subjected to police harassment is part of the work of the Cape Town-based Women's Legal Centre (WLC), a nonprofit, independently funded law centre that also promotes sex worker rights in South Africa. It works closely with the Sex Workers Education and Advocacy Taskforce (SWEAT) and Sisonke, South Africa's national sex worker movement.

The WLC began by running weekly workshops for sex workers on human rights and laws related to sex work. The need for hands-on assistance was clear, and the WLC soon took on and trained four sex workers as community-based paralegals. They now accompany a SWEAT team on outreach visits to sex work hotspots in Cape Town, and they provide sex workers of all genders with information and advice, escort them to medical clinics or to court, and help with bail applications.

The WLC has produced pamphlets and an information card for sex workers that explains their rights if arrested or detained. Each year, it handles about 120 cases relating to sex work, and it has noticed marked improvements in the behaviour and attitudes of police toward sex workers. By linking conventional services with outreach and support, the WLC manages to base its legal assistance around sex workers themselves, affording them the means to challenge violations of their rights in a direct manner.

*Summarized from Bringing justice to health: the impact of legal empowerment projects on public health. New York: Open Societies Foundations; ([https://www.opensocietyfoundations.org/sites/default/files/bringing-justice-health-20130923\\_0.pdf](https://www.opensocietyfoundations.org/sites/default/files/bringing-justice-health-20130923_0.pdf); accessed 5 July 2017).*



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## 5. 90-90-90 WITHIN A COMPREHENSIVE APPROACH

Sustained antiretroviral therapy for people living with HIV has individual-level and population-level impacts, reducing both the risk of HIV transmission within a community and a person's risk of falling ill and dying from AIDS-related illnesses. The fact that more than one in two people living with HIV globally were not virally suppressed at the end of 2016, however, reinforces the need for a continuum of prevention and treatment services delivered at scale. Closing gaps in service coverage requires intensified efforts to reach and empower women and girls, young people and key populations in order to enhance their agency and ensure their human rights are respected and protected.

### ELIMINATING MOTHER-TO-CHILD TRANSMISSION

Some of the greatest successes of the global AIDS response have been achieved in the earliest phases of life, as programmes for elimination of HIV transmission from mothers to children continue to grow in scale and quality. Gains have been especially impressive in the 23 *Start Free Stay Free AIDS Free* priority countries, where 88% of pregnant women living with HIV reside. Several of those countries have managed to reduce mother-to-child transmission rates to under 5%, including throughout breastfeeding (1). A growing number of countries with relatively low HIV prevalence have validated or are close to validating the elimination of mother-to-child transmission of HIV and congenital syphilis.

A major milestone on the way to the elimination of mother-to-child transmission of HIV is diagnosing and providing lifelong antiretroviral therapy to at least 95% of pregnant and breastfeeding women living with HIV. Five priority countries had already achieved this 95% coverage target as of 2016: Botswana, Namibia, South Africa, Swaziland and Uganda (Figure 5.1).

Several challenges must be addressed to close remaining gaps. Current programmes miss many mothers who acquire HIV while they are pregnant or during the post-partum and breastfeeding periods. Some pregnant mothers who know they are living with HIV are reluctant to take antiretroviral medicines, while others stop treatment after giving birth. Routine and repeated provider-initiated voluntary screening for HIV should be part of the basic package of services for pre-pregnancy, antenatal and postnatal care in all countries with generalized HIV epidemics, and globally for women belonging to key populations (2). Partner testing can identify women in serodiscordant relationships who are at high risk of acquiring HIV. Finally, in order to maximize the benefits of lifelong antiretroviral therapy, women require more effective counselling and preparation before they start antiretroviral therapy; they also need supportive services at the family, community and facility levels to enhance their retention in care. Children born to mothers living with HIV require early infant diagnosis and, if found to be living with HIV, rapid initiation of paediatric treatment (see Chapter 3).

REACHING A MILESTONE TOWARDS ELIMINATION OF MOTHER-TO-CHILD TRANSMISSION

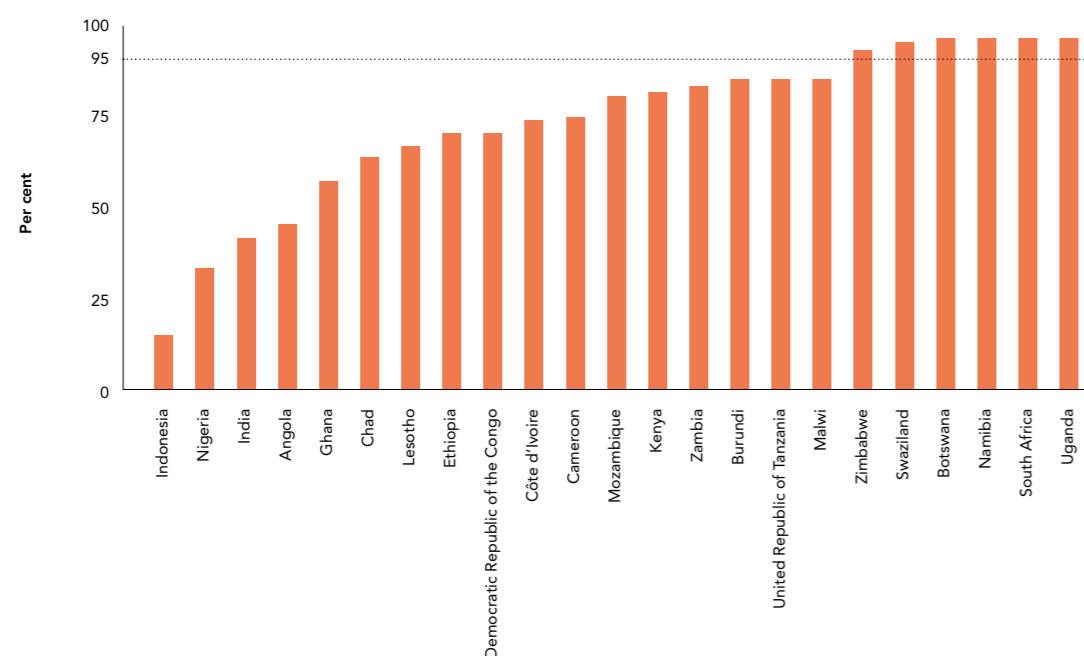


FIGURE 5.1. PERCENTAGE OF PREGNANT WOMEN LIVING WITH HIV RECEIVING ANTIRETROVIRAL MEDICINES\* TO PREVENT MOTHER-TO-CHILD TRANSMISSION, 23 PRIORITY COUNTRIES\*\*, 2016

Source: UNAIDS 2017 estimates.

\* Either prophylaxis or lifelong therapy.

\*\* *Start Free Stay Free AIDS Free* priority countries.

## CONDOMS

Male and female condoms are effective, cheap and easy to use. Increases in condom use by people at higher risk of acquiring HIV coincided with declines in HIV infections in many countries. All 11 countries with high HIV prevalence (>2%), a greater than 30% decline in new infections, and sufficient data on condom use between 2000 and 2016<sup>1</sup>, recorded an increase in condom use among both men and women (Figure 5.2). Men's condom use during paid sex also increased during this period in a majority of these countries. Condom use at last high risk sex (with a non-marital, non-cohabiting partner) was highest in Botswana (94%, 2013), Zimbabwe (85%, 2015), Namibia (80%, 2013) and Malawi (76%, 2015).

### INCREASES IN CONDOM USE COINCIDE WITH DECLINES IN NEW HIV INFECTIONS

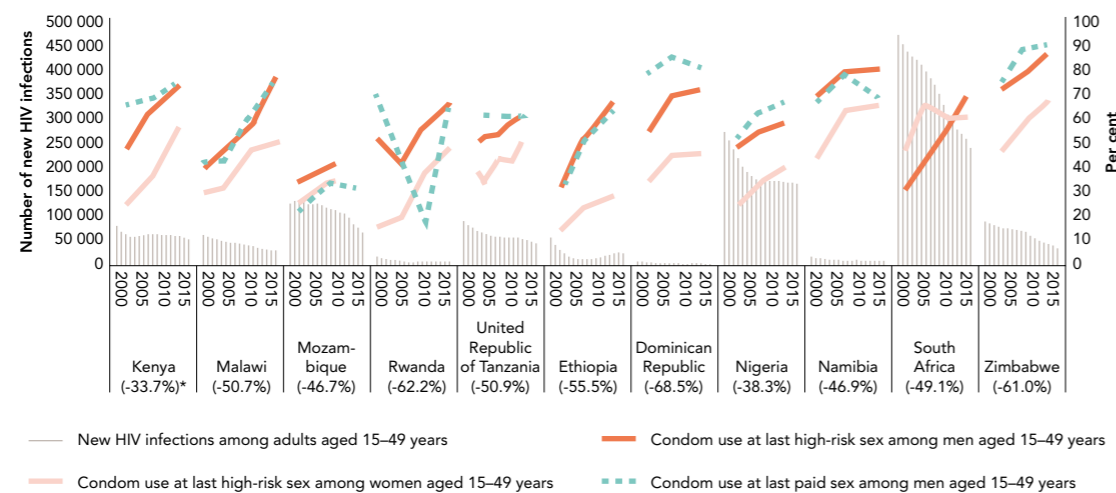


FIGURE 5.2. CONDOM USE AT LAST HIGH-RISK SEX AND NEW HIV INFECTIONS, ADULTS (AGED 15-49 YEARS), 11 COUNTRIES, 2000-2016

Source: UNAIDS 2017 estimates. Population-based surveys, 2000-2016.

\* Percent decrease in new infections between 2000 and 2016.

Condoms remain a mainstay HIV prevention tool for sex workers. Among 74 countries that reported survey data, 51 said that 80% or more sex workers reported using a condom during their last sexual intercourse with a client. Among 22 reporting countries, condom programmes distributed a median of 86 condoms per sex worker, with three countries distributing more than 300 condoms per sex worker, and an additional two countries distributing more than 200 condoms per sex worker.

Condoms have wider benefits beyond HIV in terms of preventing sexually transmitted infections (STIs) and unintended pregnancy. A recent analysis of investment costs and the potential returns of condom programmes concluded that investing an additional US\$ 27.5 billion in male condoms as part of a package of contraceptives in 81 countries by 2030 would meet all unmet demands for family planning and 90% of the condom needs for HIV and STI prevention among people at high risk of infection. This could prevent 700 million STIs, 17 million HIV infections and 420 million unintended pregnancies, averting a total of 240 million disability-adjusted life years (DALYs) at a cost of US\$ 115 per DALY (3). Post-test counselling is an excellent opportunity to introduce and reinforce condom use and other HIV prevention strategies.

<sup>1</sup> Measurements of condom use at last high-risk sex in at least three nationally representative population-based surveys.

## HARM REDUCTION

The comprehensive package of services recommended by the World Health Organization, United Nations Office on Drugs and Crime, and UNAIDS for preventing the spread of HIV and reducing other harms associated with drug use includes needle-syringe programmes, opioid substitution therapy, HIV testing and antiretroviral therapy. Countries that have adopted a comprehensive approach to harm reduction are delivering better health outcomes for people who inject drugs and their sexual partners, including reductions in HIV and hepatitis infections and more effective management of drug use and drug-related crime (4). In British Columbia, Canada, modelling analyses of data from 1996 to 2013 show the impact of harm reduction and antiretroviral therapy. These analyses found that harm reduction services played a vital role in reducing HIV and hepatitis C incidence in the province, and that they should be viewed as critical and cost-effective tools within combination implementation strategies (5, 6). However, only 12 of 60 reporting countries were meeting the internationally recommended 200 sterile needles and syringes distributed per person who injects drugs as per the most recent data available from 2014 to 2016 (Figure 5.3).

### INSUFFICIENT DISTRIBUTION OF A CRITICAL AND COST-EFFECTIVE PREVENTION TOOL

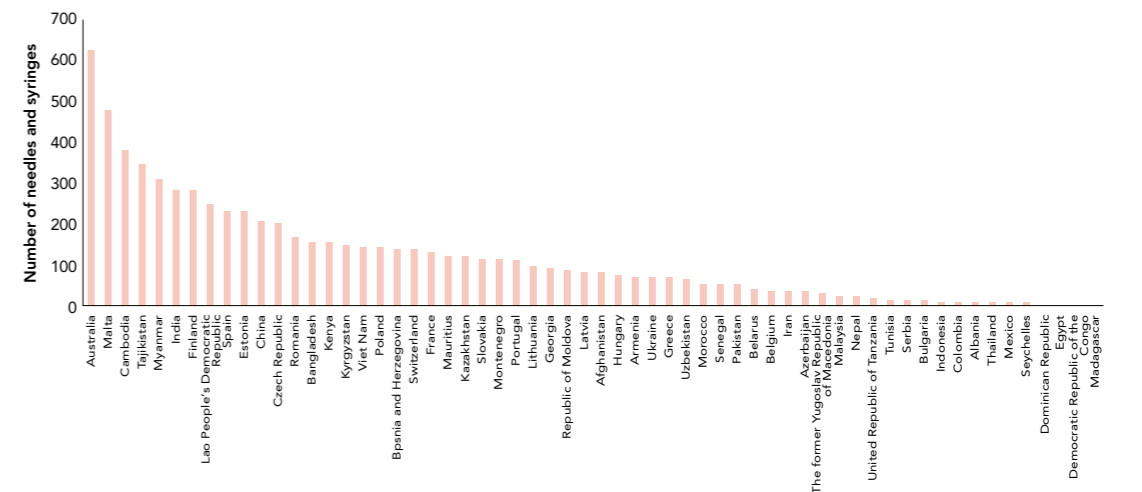


FIGURE 5.3. NUMBER OF STERILE NEEDLES AND SYRINGES DISTRIBUTED PER PERSON WHO INJECTS DRUGS, BY COUNTRY, 2014-2016.

Source: Global AIDS Monitoring, 2015-2017.

\*Most recently available data from 2014 to 2016.

In Switzerland, harm reduction services include needle-syringe programmes, provision of sterile equipment, safe injecting rooms, drug dependence treatment (including opioid substitution therapy) and various types of psychosocial support. The percentage of new HIV infections due to use of non-sterile injecting equipment in Switzerland has declined from 50% of all new HIV infections in the 1980s to just 3% of new HIV infections in recent years. In 2013, only 12 men and three women who inject drugs in Switzerland were diagnosed with HIV (7).

Even in countries with mature harm reduction programmes, vigilance is critical to preventing outbreaks such as those experienced in recent years in Greece, Ireland, Romania and Scotland (8-11). Analysis of a 2014 outbreak in Glasgow, United Kingdom, emphasized that harm reduction services must be accessible by people who inject drugs facing difficult living conditions, such as homelessness (8).

## PRE-EXPOSURE PROPHYLAXIS

Oral pre-exposure prophylaxis (PrEP) is an additional, discreet HIV prevention option for people at high risk of HIV infection. HIV testing services can link PrEP scale-up to efforts to achieve the 90–90–90 targets by offering PrEP to individuals who test HIV-negative. In several cities in North America and western Europe—including London, San Francisco and Washington DC—PrEP use appears to be contributing to declines in the number of new cases of HIV (12–14).

### AVAILABILITY OF PREP STILL LIMITED

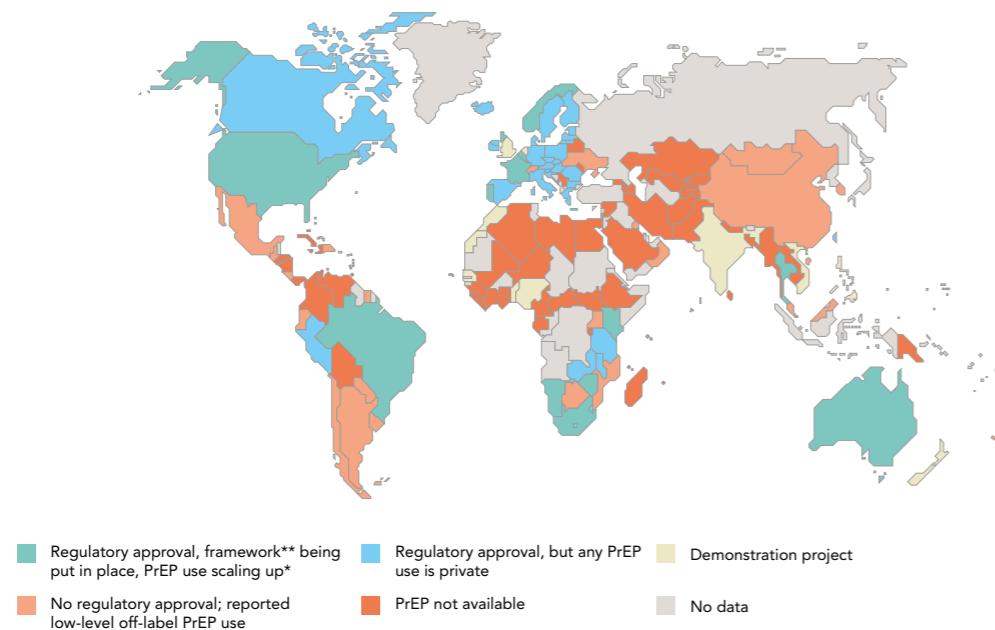


FIGURE 5.4. AVAILABILITY OF PRE-EXPOSURE PROPHYLAXIS, BY COUNTRY, 2017

Source: 2017 National Commitments and Policy Instrument.

\* See text for further explanation.

\*\* A framework for PrEP scale-up includes clinical guidelines; service provider training; access-oriented PrEP services; use of generic PrEP, price subsidy or reimbursement; effective demand creation.

As of June 2017, some level of PrEP access has been reported in more than 60 countries, at least twice as many as in 2016, but the number of people accessing PrEP globally remains limited. The number of people who started on PrEP between 2012 and early 2017 has been estimated at nearly 250 000 (15). Of these, the majority (220 000) were in the United States of America, where an estimated 124 000 people were taking PrEP monthly in 2017 (16). PrEP programmes in France and Australia are progressing to scale, with uptake rapidly increasing among gay men and other men who have sex with men (15). Kenya, South Africa and Zimbabwe are high-HIV-burden countries in the process of rolling out PrEP (15). Regulatory approval of the use of antiretroviral medicines as prophylaxis had been granted in 50 countries by June 2017, but only 15 of these countries had established or committed to establishing a PrEP programme at scale (15).<sup>2</sup>

Beyond national programmes, PrEP access is through private means. Several examples exist in Europe and Canada of regulated clinics providing support to people who have bought their prescribed PrEP via the internet. Private practitioners provide PrEP in up to 40 countries without national programmes. All PrEP services should be regulated so that its use occurs only with a prescription, a negative HIV test, clinical follow-up of safety risks, adherence support, and screening and treatment of other STIs.

<sup>2</sup> The 15 countries are Australia, Belgium, Brazil, France, Israel, Kenya, Luxembourg, Namibia, Norway, Portugal, Scotland, South Africa, Thailand, United States and Zimbabwe.

## VOLUNTARY MEDICAL MALE CIRCUMCISION

Voluntary medical male circumcision is a cost-effective, one-time intervention that provides lifelong partial protection against female-to-male HIV transmission. Efforts to voluntarily circumcise men in 14 priority countries in eastern and southern Africa accelerated rapidly from 2008 to 2014, reaching 3.2 million circumcisions per year. In 2015 and 2016, however, the annual number of circumcisions fell to about 2.6 million circumcisions. Trends varied among the priority countries. In Kenya, Malawi, Mozambique, Namibia, Swaziland and Zimbabwe the numbers of circumcisions conducted have continued to increase; in Botswana, Ethiopia, Lesotho, Rwanda and Zambia, a big reduction in circumcisions between 2014 and 2015 was partially reversed in 2016. In South Africa, Uganda and the United Republic of Tanzania, however, annual circumcisions have declined relatively precipitously.

### VOLUNTARY MEDICAL MALE CIRCUMCISION NEEDS A BOOST IN KEY COUNTRIES

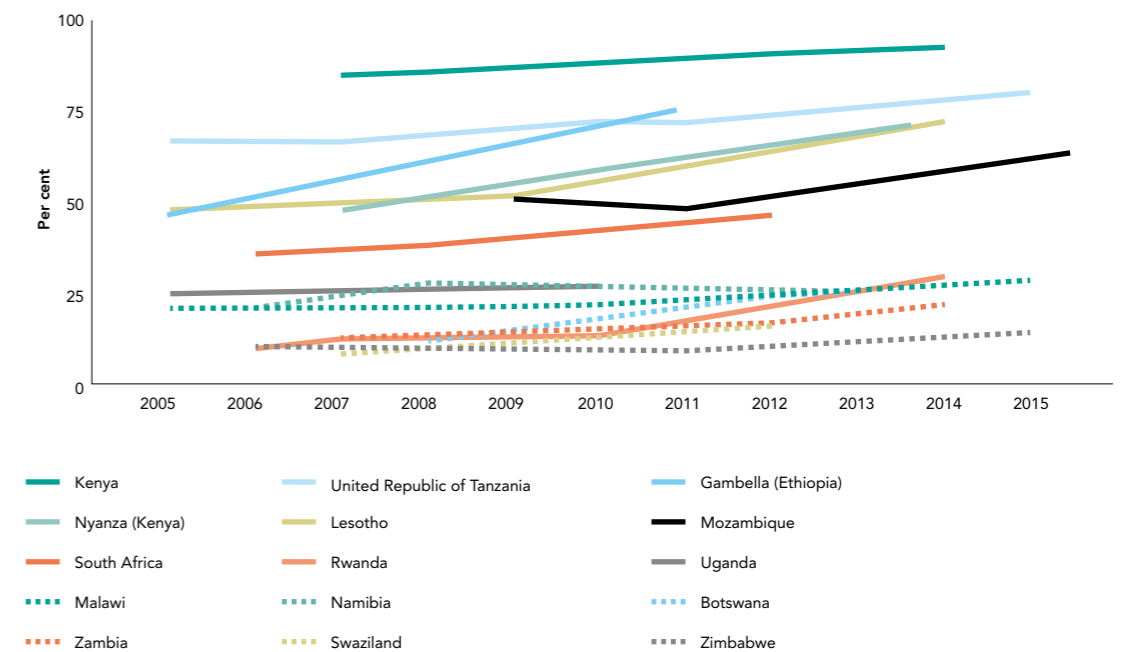


FIGURE 5.5. PREVALENCE OF MALE CIRCUMCISION (AGED 15–49), 14 PRIORITY COUNTRIES, 2005–2015

Source: Population-based surveys, 2005–2015.

Available data from population-based surveys show that the prevalence of voluntary medical male circumcision among adult men (aged 15–49 years) was below 30% in Botswana, Malawi, Namibia, Rwanda, Swaziland, Uganda, Zambia and Zimbabwe (Figure 5.5).

Energizing programmes in the 14 priority countries will be critical to achieving the target of 25 million circumcisions between 2016 and 2020. The global strategic framework for voluntary medical male circumcision provides directions towards including this particular intervention into wider service packages for men and boys of different ages, including those for sexual and drug use counselling, masculinity issues and gender norms, condom provision, HIV testing and referral for treatment. The framework aims to voluntarily circumcise 90% of males (aged 10–29 years) in priority settings by 2021 (17).

## EMPOWERING YOUNG PEOPLE

A critical piece of a comprehensive approach is ensuring that young people have the knowledge and services they need to stay healthy. Although comprehensive knowledge about HIV has increased, only 36% of young men and 30% of young women (aged 15–24 years) had comprehensive and correct knowledge of how to prevent HIV in the 37 countries with available data for the period 2011 to 2016. Without accurate knowledge about HIV, young people are likely to have unrealistically low perceptions of their HIV risk and to be less inclined to protect themselves from acquiring HIV. Among the 41 countries with data available for both young men and women (aged 15–24 years) for the period 2011 to 2016, condom use at last high-risk sex in the previous 12 months was less than 50% among young women in 31 countries and among young men in 18 countries.

### ENSURING YOUNG PEOPLE HAVE THE KNOWLEDGE THEY NEED

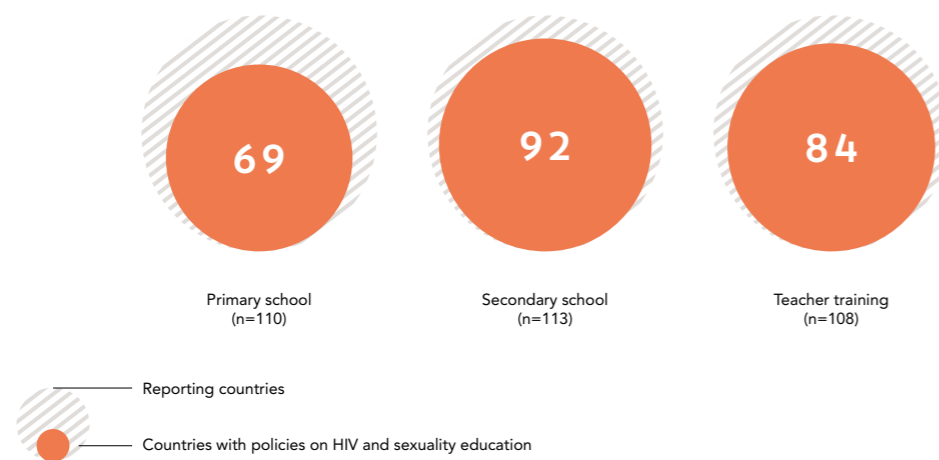


FIGURE 5.6. COUNTRIES WITH EDUCATION POLICIES THAT PROVIDE FOR LIFE SKILLS-BASED HIV AND SEXUALITY EDUCATION IN SCHOOLS AND TEACHER TRAINING, 2016

Source: 2017 National Commitments and Policy Instrument.

School-based sex and sexuality education is an important strategy for improving HIV-related knowledge and reducing risk, as shown in a systematic review of 64 studies from six continents (18).<sup>3</sup> Most countries have policies or strategies that support life skills-based HIV and sexuality education (Figure 5.6), but it is not clear how many of them actually implement those policies and at what scale they occur. A 2015 review concluded that the scope and quality of such education interventions, particularly in sub-Saharan Africa, did not match the threats posed by HIV and other STIs (19).

Barriers to service access include consent laws, such as those that criminalize sex between adolescents, and laws that require parental or spousal consent for the use of HIV and sexual and reproductive health services. In 2016, individuals younger than 18 years needed parental consent in 63% of 108 reporting countries to use sexual and reproductive health services. They also needed parental consent if they wished to take an HIV test in 71% of the countries, and in 56% of the countries to access HIV treatment. About three quarters (79 of 110) of reporting countries in 2016 stated they had no age restrictions on access to condoms, but half of the reporting countries in eastern and southern Africa and 44% of those in western and central Africa reported the existence of age restrictions for accessing condoms.

<sup>3</sup> Students who received school-based sex education interventions were found to have significantly stronger HIV knowledge, higher levels of condom use, and greater likelihood of delayed sexual debut than students who lacked such education.

## ENDING VIOLENCE AGAINST WOMEN AND GIRLS

For decades, gender inequality, discrimination and violence have put women, girls and key populations at heightened risk of HIV infection and eroded the benefits of HIV and other health services. Violence—or the fear of violence—impedes the ability of women to insist on safer sex and to use and benefit from HIV prevention, testing and treatment interventions, and sexual and reproductive health services (20–22). In some regions, women who are subjected to intimate partner violence are on average 1.5 times more likely to acquire HIV (23). Violence against women is also associated with weakened adherence to PrEP, post-exposure prophylaxis and HIV treatment, including for pregnant women, and it is linked to poor clinical outcomes for women on antiretroviral therapy (24–26).

### LAWS ON DOMESTIC VIOLENCE

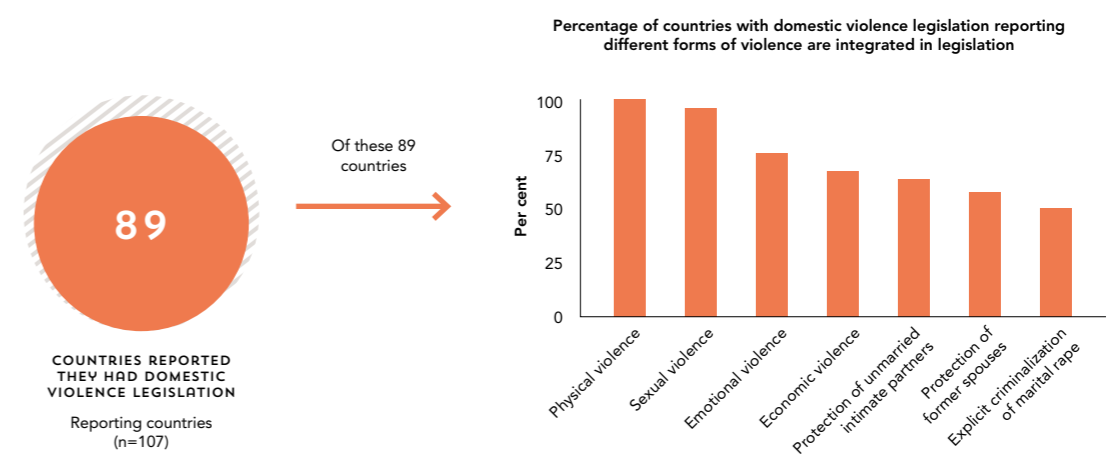


FIGURE 5.7. PERCENTAGE OF COUNTRIES WITH DOMESTIC VIOLENCE LEGISLATION REPORTING THAT DIFFERENT FORMS OF VIOLENCE ARE INTEGRATED IN LEGISLATION, REPORTING COUNTRIES, 2016

Source: 2017 National Commitments and Policy Instrument.

Social interventions—including group training for women and men, and community mobilization—have been shown to reduce intimate partner violence in studies in China, South Africa and Uganda (27–31). For instance, the Safe Homes and Respect for Everyone (SHARE) project in Uganda has shown that a combination of community programming and clinic-based services can reduce both intimate partner violence and HIV incidence in women (30). Economic empowerment and cash transfers also can help protect women against gender-based violence (29, 32).

Explicit, purposeful legal reforms can have a huge impact. In the United States, for example, the declining rate of intimate partner violence—which dropped by 53% between 1993 and 2008—has been attributed in part to the Violence against Women Act (33). Authorized in 1994, the Act provides funding for a wide range of programmes aimed at reducing gender-based violence. Of the 107 reporting countries in 2016, 89 had legislation against domestic violence in place, with the majority of these legal frameworks providing broad protection (Figure 5.7).

## STRENGTHENING SOCIAL PROTECTION

Interventions that enable adolescents, especially girls, to enter primary school and extend their schooling to secondary education are associated with multiple benefits, including decreased levels of unwanted and unintended pregnancy, lower rates of HIV infection and reduced risk of partner violence (34, 35). Evidence shows that cash transfers enable girls to remain in school, and that they also empower women, reduce intimate partner violence and contribute to safer sexual health—all outcomes that can support more equitable social and economic development and reduce HIV vulnerability and risk (36–41).

### KEEPING GIRLS IN SCHOOL

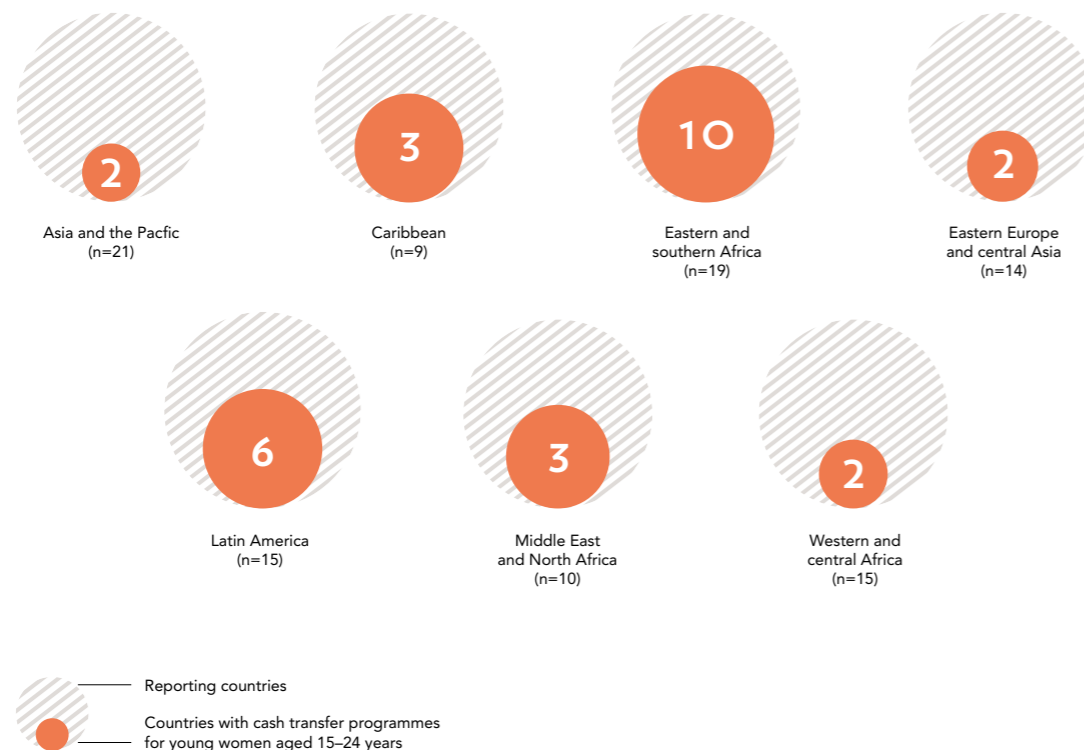


FIGURE 5.8. COUNTRIES WHERE CASH TRANSFER PROGRAMMES FOR YOUNG WOMEN (AGED 15–24 YEARS) ARE BEING IMPLEMENTED, BY REGION, 2016

Source: 2017 National Commitments and Policy Instrument.

In Zambia, the Girls' Education and Women's Empowerment and Livelihoods Project is funding the secondary school fees of about 14 000 adolescent girls from impoverished households as part of the country's social protection system (42). South Africa's child support grant—paid to more than 12 million people, 95% of them women—has been shown to improve education levels, empower women and alleviate poverty, and it may be reducing high-risk sexual liaisons among adolescent girls (37, 43–45).<sup>4</sup> Cash transfers are also among the core package of evidence-informed interventions within the PEPFAR DREAMS programme (46). Cash transfer programmes feature in 10 countries in eastern and southern Africa and six countries in Latin America, but they are rarer in other regions (Figure 5.8).

<sup>4</sup> South Africa's child support grant is for R350 (about US\$ 26) per month per child under 18 years of age.

## AIDS OUT OF ISOLATION

Taking the AIDS response further out of isolation accelerates progress against HIV and across the Sustainable Development Goals. The overlapping epidemics of HIV, tuberculosis, viral hepatitis and human papillomavirus (HPV) face similar challenges and features, including modes of transmission, diagnostic difficulties and affected populations that are hard to reach. Improved collaboration between health programmes can strengthen health systems and improve efficiency.

### GAINS IN THE GLOBAL RESPONSE TO TUBERCULOSIS AND HIV

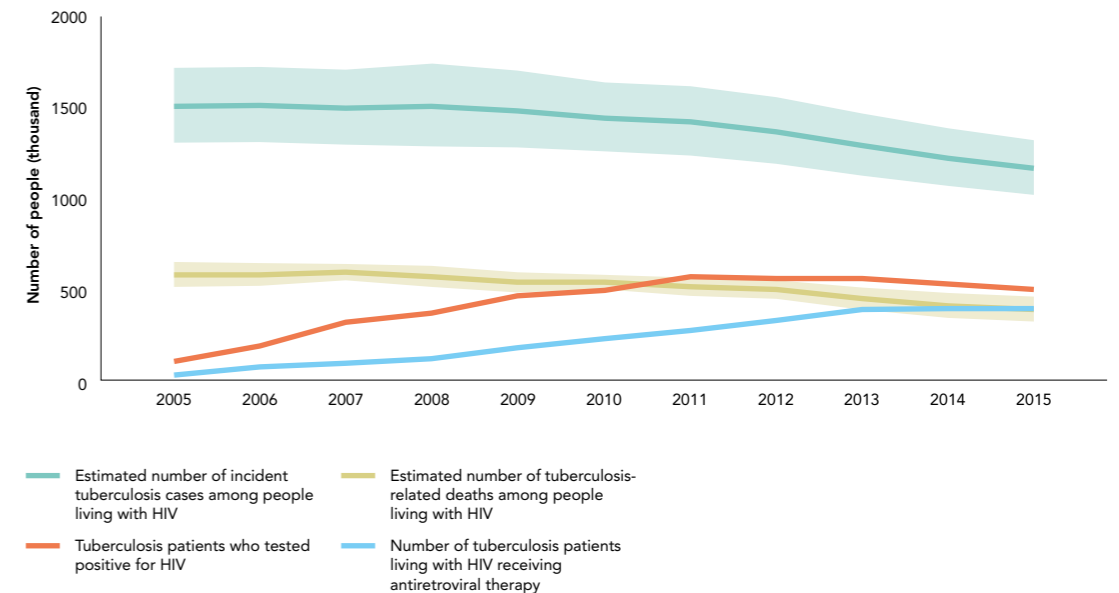


FIGURE 5.9. TUBERCULOSIS CASES AND TUBERCULOSIS-RELATED DEATHS AMONG PEOPLE LIVING WITH HIV, NUMBER OF NOTIFIED TUBERCULOSIS PATIENTS WHO WERE KNOWN TO BE LIVING WITH HIV, AND NUMBER OF TUBERCULOSIS PATIENTS LIVING WITH HIV ON ANTIRETROVIRAL THERAPY, GLOBAL, 2005–2015

Source: Global tuberculosis report, 2016. Geneva: World Health Organization; 2016.

Major gains in the global response to tuberculosis and HIV have led to declining tuberculosis incidence and tuberculosis deaths (Figure 5.9). Tuberculosis-related deaths among people living with HIV have declined by one third, from a peak of about 593 000 in 2007 to 389 000 in 2015. It is estimated that closer collaboration between HIV and tuberculosis programmes in sub-Saharan Africa averted an estimated 5.9 million deaths between 2000 and 2014 (47). Despite this, tuberculosis remains the leading cause of hospital admission and mortality among people living with HIV (48, 49). In addition, chronic hepatitis B and hepatitis C infection are major causes of illness and death in several countries, and women living with HIV who are infected with HPV are much more likely to develop and die from cervical cancer than HIV-negative women (50).

New laboratory technologies are available or being developed to allow testing of different conditions using a common platform for disease-specific tests. For example, a single device can be used to diagnose tuberculosis and HIV infection, and quantitatively measure HIV and hepatitis C viral load. Such multidisease devices can increase efficiencies and improve access to appropriate prevention and treatment options for people in need (51).



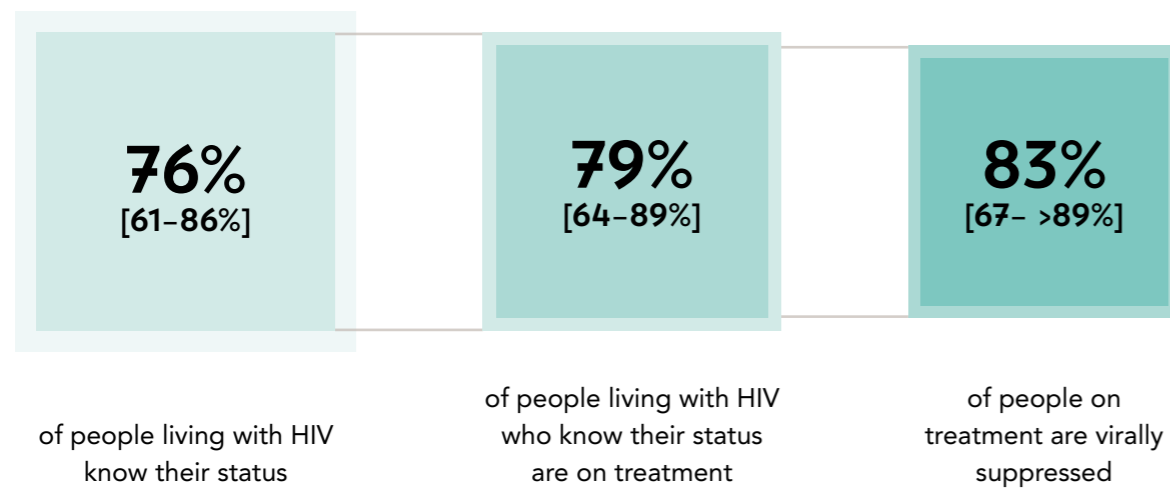
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# 6. EASTERN AND SOUTHERN AFRICA

## PROGRESS TOWARDS THE 90-90-90 TARGETS

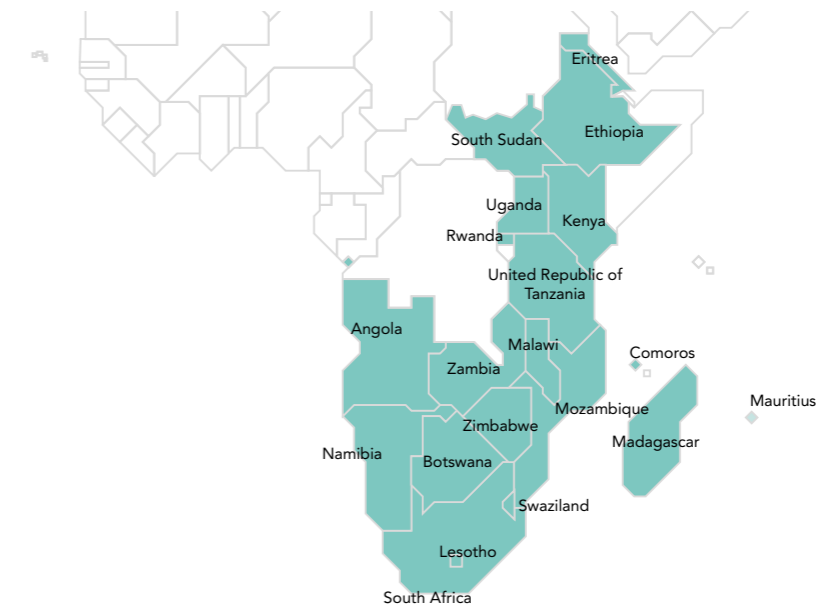


6.1. PROGRESS TOWARDS THE 90-90-90 TREATMENT TARGET, EASTERN AND SOUTHERN AFRICA, 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

Eastern and southern Africa, home to more than half of people living with HIV globally, has made huge strides towards meeting the 90-90-90 targets. Three of four people living with HIV in the region are aware of their HIV status, nearly four in five who know their HIV status are on treatment, and more than four in five who are on treatment have suppressed viral loads. The amount of financial resources available to AIDS responses in the region is close to the level required to achieve the Fast-Track Targets by 2020. Sustained support from international donors and further realization of efficiencies will be needed for ending AIDS in the world's most affected region.

## ADOPTING A TREAT ALL APPROACH



■ Treat all regardless of CD4 count ■ CD4 count of 500 cells/mm<sup>3</sup> or less

FIGURE 6.2. RECOMMENDED ANTIRETROVIRAL THERAPY INITIATION THRESHOLD AMONG PEOPLE LIVING WITH HIV PER MINISTRY OF HEALTH GUIDELINES, BY COUNTRY, EASTERN AND SOUTHERN AFRICA, 2016

Twenty of 21 countries in eastern and southern Africa have adopted the World Health Organization recommendation that antiretroviral therapy should be initiated in every person living with HIV at any CD4 cell count. Eleven countries are already implementing their treat all policies nationally.

Source: World Health Organization, 2017.

## AIDS-RELATED DEATHS NEARLY CUT IN HALF IN SIX YEARS

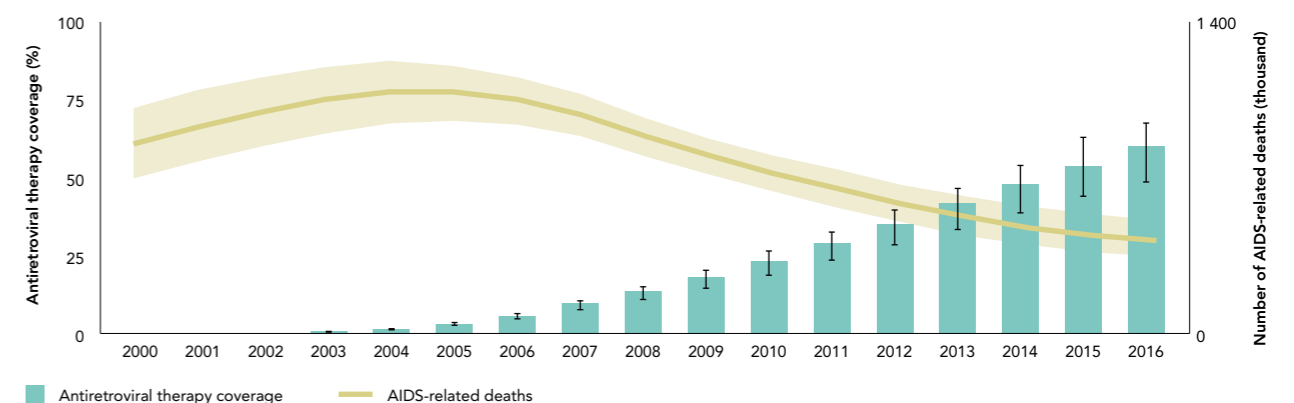
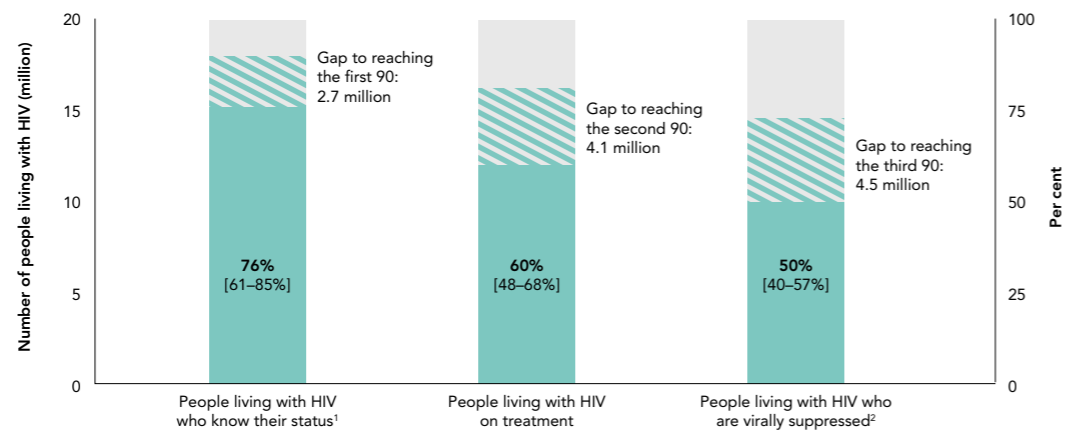


FIGURE 6.3. ANTIRETROVIRAL THERAPY COVERAGE AND NUMBER OF AIDS-RELATED DEATHS, EASTERN AND SOUTHERN AFRICA, 2000-2016

Antiretroviral therapy scale-up has been largely responsible for a steep decline in AIDS-related mortality in eastern and southern Africa: the estimated 420 000 [350 000-510 000] AIDS-related deaths in 2016 were 42% fewer than in 2010. The drop in deaths due to AIDS-related illnesses has been even greater among children (aged 0-14 years), declining from an estimated 130 000 [99 000-150 000] in 2010 to 58 000 [41 000-80 000] in 2016. AIDS-related illness remains a leading cause of death in the region, however, especially among young women and girls aged 15-24 years (1).

Source: 2017 Global AIDS Monitoring; UNAIDS 2017 estimates.

## HIV TESTING AND TREATMENT CASCADE IN EASTERN AND SOUTHERN AFRICA



**FIGURE 6.4. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, EASTERN AND SOUTHERN AFRICA, 2016**

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

<sup>1</sup> 2016 measure derived from data reported by 17 countries, which accounted for 99% of people living with HIV in western and central Africa.

<sup>2</sup> 2016 measure derived from data reported by 11 countries. Regionally, 37% of all people on antiretroviral therapy were reported to have received a viral load test during the reporting period.

## CLOSING THE GAPS ACROSS THE HIV TESTING AND TREATMENT CASCADE

More than three quarters (76% [61–86%]) of the 19.4 million [17.8–21.1 million] people living with HIV in eastern and southern Africa at the end of 2016 were aware of their HIV status. Of those who knew their status, 79% [64–89%] were accessing antiretroviral therapy, which is equivalent to 60% [48–68%] of all people living with HIV in the region. Among those accessing treatment, 83% [67–>89%] were virally suppressed, which translates into 50% [40–57%] of all people living with HIV in the region (Figure 6.4).

### Knowledge of HIV status

Knowledge of HIV status among people living with HIV in eastern and southern Africa increased from 72% [58–82%] in 2015 to 76% [61–86%] in 2016 (Figure 6.5). The gap to achieving the first 90 was 2.7 million people living with HIV who did not know their HIV status.

Provider-initiated testing remains the mainstay approach, but community-based testing is proving effective for reaching large numbers of first-time testers, diagnosing people living with HIV at earlier stages of their HIV infection and linking those who test positive to care (2). Health worker-led workplace and home-based (door-to-door) testing that uses rapid diagnostic tests is also increasingly featured (3).

South Africa has introduced self-testing, and several other countries have pilots in place, including Malawi, Zambia and Zimbabwe, where a major evaluation of different models of self-testing is underway (4). Experiences in Malawi and elsewhere in the region suggest that when HIV self-testing is provided as part of a community-based approach, it can increase uptake of testing services (including among men and adolescents) and facilitate linkages to care, especially among individuals who are at high risk of HIV infection (5, 6).

### Accessing HIV treatment

The estimated 11.7 million [10.3 million–12.1 million] people on antiretroviral therapy in the region in 2016 represented an almost threefold increase over 2010 numbers. As the overall population of people living with HIV in the region slowly increased, this scale-up translated to a coverage increase from 23% [19–27%] in 2010 to 60% [48–68%] in 2016. Sustained progress is needed to ensure that 81% of all people living with HIV in the region are accessing treatment by 2020. In 2016, the gap to fully achieving the second 90 was starting an additional 4.1 million people on antiretroviral therapy.

Treatment coverage was highest in Botswana at 83% [65–95%] and Rwanda at 80% [61–93%], but several countries with large populations of people living with HIV reported coverage below the regional average: Ethiopia at 59% [42–76%], South Africa at 56% [50–61%] and Mozambique at 54% [41–63%].

Countries are increasing collaboration between communities, civil society organizations and government health systems to expand access to HIV treatment. In Zimbabwe’s Seke District, Southern Africa HIV and AIDS Dissemination Service (SAfAIDS) has been working with traditional leaders and opinion-makers to mobilize communities for testing and treatment. Within three months, the number of people taking HIV tests and initiating treatment at government clinics more than doubled (7). A similar approach is being piloted in high-burden communities in Malawi, Swaziland and Zambia.

Paediatric treatment has improved impressively, with regional coverage approaching 51% [37–63%] in 2016, up from 19% [14–23%] in 2010. Over 60% of children living with HIV were on antiretroviral therapy in Botswana, Kenya, Namibia and Swaziland in 2016.

Occasional stock-outs of essential medicines and health commodities reported by countries underscore the need to strengthen procurement and supply chain management systems in most countries in the region. Further health system strengthening also will be needed to decentralize service delivery and scale up community-based HIV treatment. The Global Fund to Fight AIDS, Tuberculosis and Malaria (the Global Fund), the Government of the United States of America and the Clinton Health Access Initiative (CHAI) are among the partners supporting countries to strengthen their systems.

### Achieving viral suppression

Approximately 50% [40–57%] of people living with HIV in eastern and southern Africa in 2016 were virally suppressed, an increase from 45% [36–51%] in 2015 (Figure 6.7). Reaching the third 90 in the region by 2020 is achievable—the gap in 2016 was the viral suppression of an additional 4.5 million people living with HIV.

Botswana (78%) has achieved the 73% target of viral suppression among all people living with HIV, Swaziland (68%) is closing in on the target, and seven other countries have achieved viral suppression rates of between 40% and 64%. However, available data suggest low levels of viral suppression in Angola (16%), the Comoros (32%), Madagascar (3%) and Mauritius (18%).

The use of task shifting and continued decentralization of treatment services to primary health facilities (including services for children living with HIV) will be essential to ensuring that large numbers of people remain on HIV treatment (8–12). Peer support and counselling are crucial, including during interactions between patients and health workers (13); so are the community-based treatment adherence clubs and other support services

operating in South Africa and elsewhere in the region (14, 15). Weekly mobile phone text reminders also have been found to improve adherence (13, 16).

Treatment adherence can be strengthened by reducing the frequency of clinic visits and medication pickups for patients who are stable on treatment (17, 18), and by streamlining clinic care to shorten patient visits (19). Increased community management of antiretroviral therapy also is an attractive approach, including dispensing antiretroviral medicines in communities rather than only at clinics and hospitals (20). In Malawi, the government has mapped existing community service delivery models with the aim of adopting an approach that can be scaled up nationally (21).

Other improvements include strengthening patient and case reporting systems and introducing defaulter tracing mechanisms to track and re-engage patients who have missed appointments or drug pick-ups (22). Botswana and Swaziland have introduced unique identifier codes to track patients, while the United Republic of Tanzania uses unique identifiers only for key population programme monitoring. Namibia has an electronic patient monitoring system to record patient information, but it does not specifically use unique identifiers to track them.

Data reported to UNAIDS from 12 countries in the region showed that about 44% of people accessing antiretroviral therapy in eastern and southern Africa also had accessed routine viral load testing in 2016. Eritrea is currently the only country in the region that lacks a national policy on routine viral load testing. Improved access to viral load testing is important for managing the growing number of people on antiretroviral therapy. High prices, weak infrastructure and capacity challenges mean that viral load testing is far from routine, and existing facilities are mostly located in cities (23).

#### GAINS ACROSS THE TREATMENT CASCADE

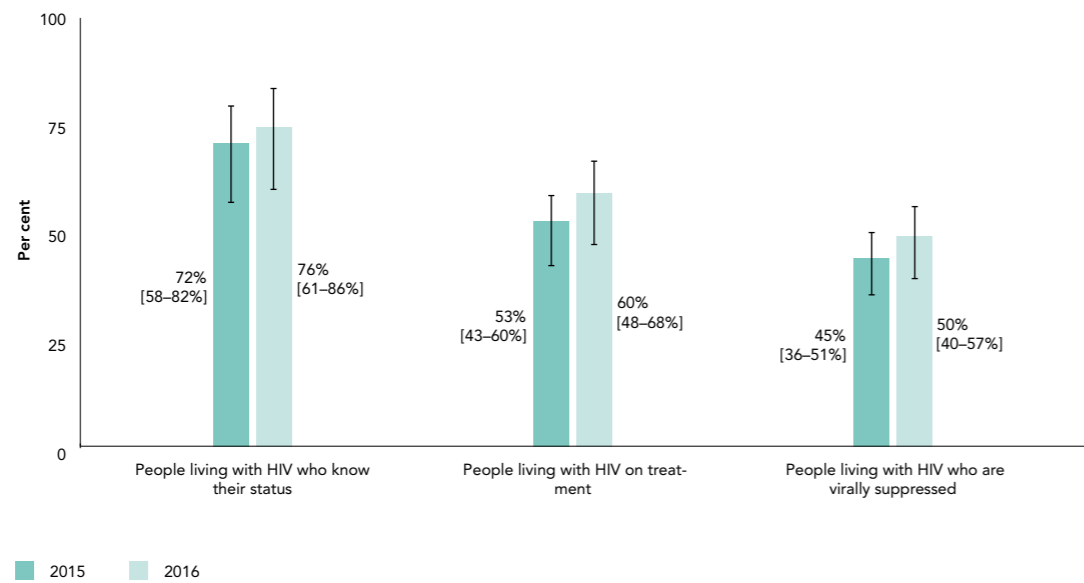


FIGURE 6.5. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, EASTERN AND SOUTHERN AFRICA, 2015 AND 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

#### HIV INFECTIONS IN WORLD'S MOST AFFECTED REGION DECLINED BY NEARLY A THIRD

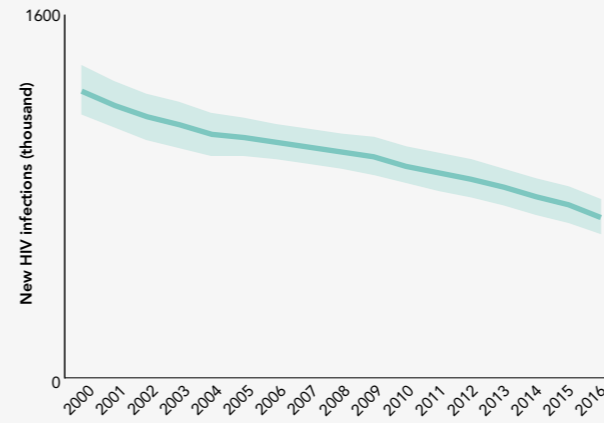


FIGURE 6.6. NUMBER OF NEW HIV INFECTIONS, ADULTS (AGED 15 YEARS AND OLDER), EASTERN AND SOUTHERN AFRICA, 2010-2016

Source: UNAIDS 2017 estimates.

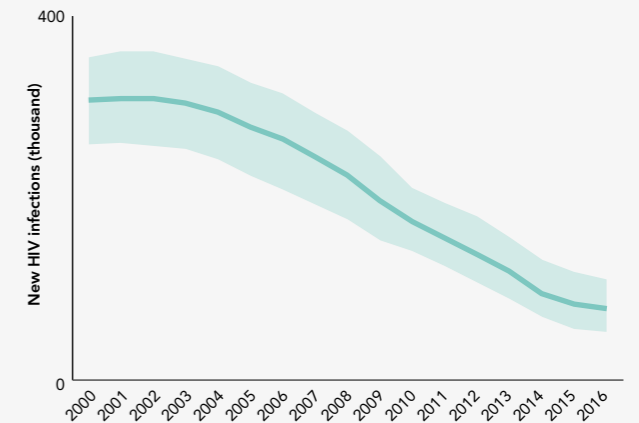


FIGURE 6.7. NUMBER OF NEW HIV INFECTIONS, CHILDREN (AGED 0-14 YEARS), EASTERN AND SOUTHERN AFRICA, 2010-2016

Source: UNAIDS 2017 estimates.

Between 2010 and 2016, new HIV infections in eastern and southern Africa declined from 1.1 million [1.0 million–1.2 million] to 790 000 [710 000–870 000], a 29% reduction. This is an important achievement in a region that contains more than half of the world's people living with HIV.

The overall reduction in new HIV infections includes a 56% drop in new infections among children, from 170 000 [140 000–210 000] in 2010 to 77 000 [52 000–110 000] in 2016. Among adults, the decline was 24% over the same period, from 940 000 [860 000–1 000 000] to 710 000 [630 000–790 000].

One third of all new infections in the region in 2016 were in one country: South Africa. An additional 50% occurred in Kenya, Malawi, Mozambique, Uganda, the United Republic of Tanzania, Zambia and Zimbabwe. Declines in new infections between 2010 and 2016 were greatest in Mozambique, Uganda and Zimbabwe, while in Ethiopia and Madagascar the annual number of new HIV infections was higher in 2016 than in 2010.

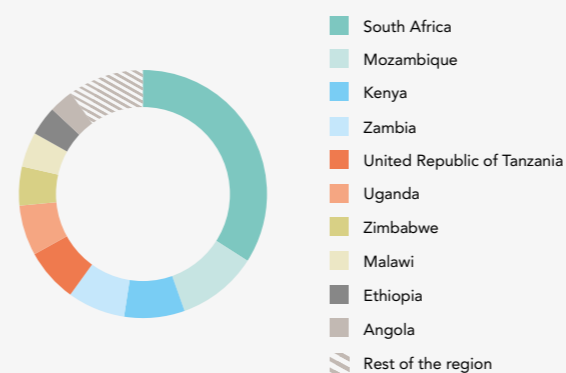


FIGURE 6.8. DISTRIBUTION OF NEW HIV INFECTIONS, BY COUNTRY, EASTERN AND SOUTHERN AFRICA, 2016

Source: UNAIDS 2017 estimates.

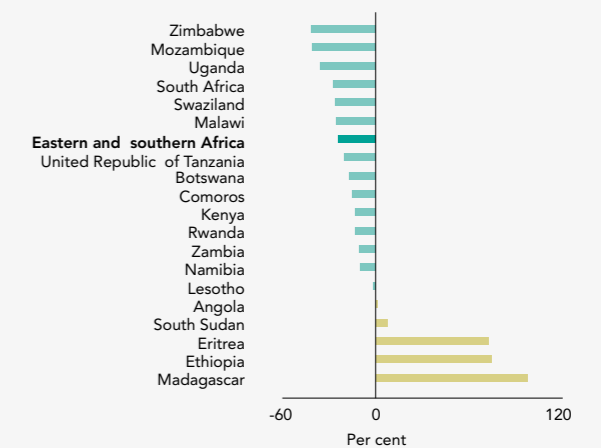


FIGURE 6.9. PERCENT CHANGE IN NEW HIV INFECTIONS, BY COUNTRY, EASTERN AND SOUTHERN AFRICA, FROM 2010 TO 2016

Source: UNAIDS 2017 estimates.

## RESOURCE AVAILABILITY IS NEAR FAST-TRACK LEVELS

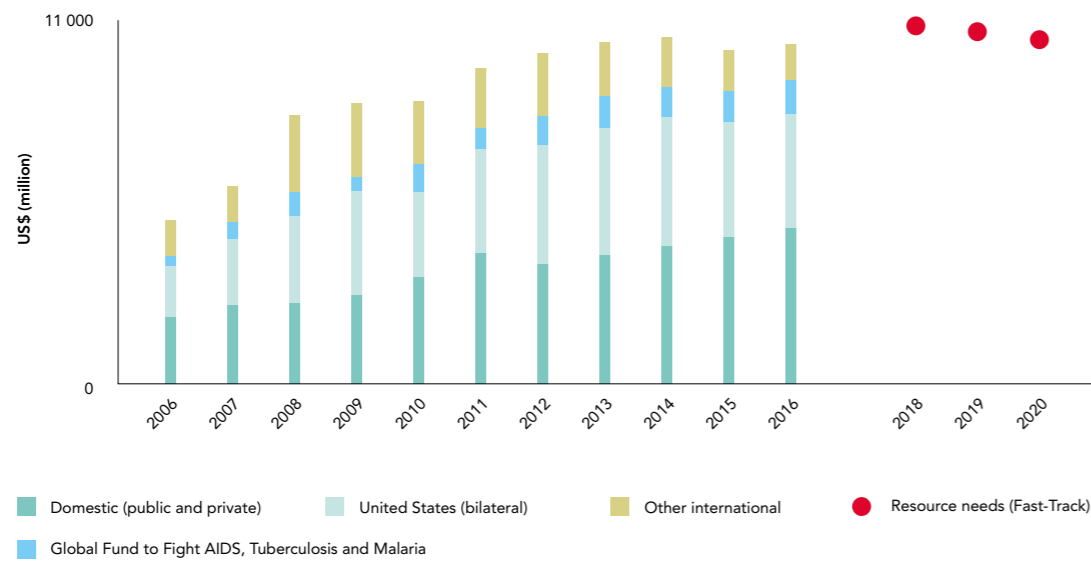


FIGURE 6.10. HIV RESOURCE AVAILABILITY BY SOURCE, 2006–2016, AND PROJECTED RESOURCE NEEDS BY 2020, EASTERN AND SOUTHERN AFRICA\*

Source: UNAIDS estimates on HIV resource availability, June 2017. Fast-Track update on investments needed in the AIDS response, 2016–2030. Geneva: UNAIDS; 2016. Financing the response to low- and middle-income countries: international assistance from donor governments in 2016. The Henry J. Kaiser Family Foundation and UNAIDS (in press). GAM/GARPR reports (2005–2017). Philanthropic support to address HIV/AIDS in 2015. Washington, DC: Funders Concerned about AIDS; 2016.

\*Estimates for low- and middle-income countries per 2015 World Bank income level classification. All figures are expressed in constant 2016 US dollars.

Resources available for HIV in eastern and southern Africa more than doubled from 2006 to 2016, reaching an estimated US\$ 9.6 billion at the end of 2016 (in constant 2016 US dollars). Domestic resources for HIV reached 46% of the total resources in 2016, their highest level to date.

The available data on resource availability indicate that cost savings and efficiency gains in HIV services, along with an increase in resources, will be needed to achieve Fast-Track Targets. If Fast-Track Targets are reached by 2020, the resources needed from 2020 to 2030 could decrease by 18% while still maintaining or improving the quality of services. However, the effectiveness of the allocation of the existing resources needs to be constantly reassessed.

Sustained support from international donors will be needed to end AIDS in the world's most affected region. Although domestic spending in the region has laudably grown 2.3-fold over the last decade, many countries continue to rely on external funding to a significant degree: among the 15 countries that reported data to UNAIDS in recent years, eight were dependent on donors for more than 80% of their HIV response.

# NAIROBI

## CITY CASE STUDY

Under the leadership of Dr Evans Kidero, the governor of Nairobi City County, the AIDS response in this sprawling city of 4.5 million residents has hit high gear since it joined the Fast-Track Cities Initiative in December 2014. Strong leadership and effective partner coordination were strategic priorities. A multisectoral AIDS committee was convened and a Fast-Track Road Map was developed, along with a Strategic AIDS Plan that is aligned with the National Strategic AIDS Framework. Those plans were rapidly put into action in a city that is home to more than 170 000 people living with HIV.

Intensive HIV testing campaigns and community-based services saw testing coverage reach an estimated 71% at the end of 2015 (24). The use of task shifting and mentors in programmes for preventing mother-to-child transmission boosted HIV testing uptake among pregnant women from 71% in 2014 to 94% in 2016 (24). Linkages to treatment also improved, with the number of people on antiretroviral therapy rising from about 93 000 in 2014 to almost 127 000 in 2016, which represents coverage of 74% (25). Community-based peer educators also are supporting referrals and linkages to care and providing psychosocial support. Finally, among the 63% of people living with HIV who took viral load tests, 87% were virally suppressed in 2016 (26).

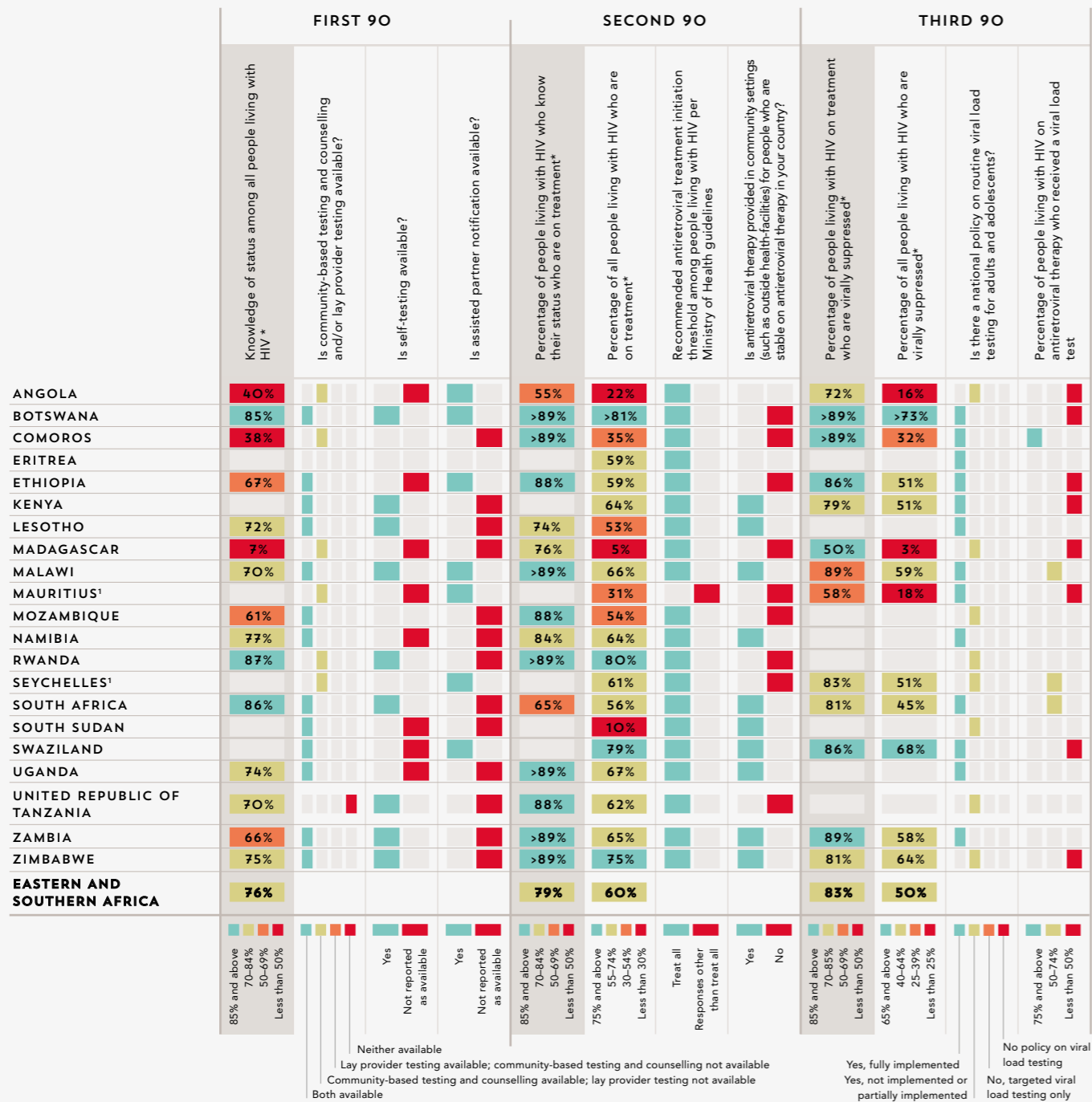
Prevention efforts also are being stepped up, especially for young people (who account for about half of new HIV infections each year) and key populations. Nairobi city programme data show that over 150 health-care workers have been trained to provide youth-friendly services, which are being rolled out gradually at health facilities, and enhanced HIV interventions are being introduced in schools. The city also has partnered with the DREAMS Initiative to reduce the HIV risks of adolescent girls and young women: 50 000 girls have been reached with skills training and economic empowerment programmes. HIV self-testing services were recently made available to young people through the private sector.

City data also show that voluntary medical male circumcision services are being boosted with the training of an additional 20 surgeons in 2016. Pre-exposure prophylaxis (PrEP) has been available at 44 facilities since April 2017, and more than 500 people enrolled since the first month. The latter programme forms part of a wider improvement of services for key populations, including enhanced services for gay men and other men who have sex with men at four city health facilities, a drop-in centre for people who inject drugs and special training for more than 120 health-care workers.



# 90-90-90 COUNTRY SCORECARDS

## EASTERN AND SOUTHERN AFRICA



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Source: UNAIDS special analysis, 2017. 2017 Global AIDS Monitoring. UNAIDS 2017 estimates. 2017 National Commitments and Policy Instrument. European Centres for Disease Control and Prevention Continuum of HIV care 2017 progress report.

\* The complete set of 90–90–90 measures and testing and treatment cascade data for countries can be found at [aidsinfo.unaids.org](http://aidsinfo.unaids.org).

<sup>1</sup> Estimates of people living with HIV that inform progress towards 90–90–90 are country-supplied and have not been validated by UNAIDS.

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# 7. WESTERN AND CENTRAL AFRICA

## PROGRESS TOWARDS THE 90-90-90 TARGETS

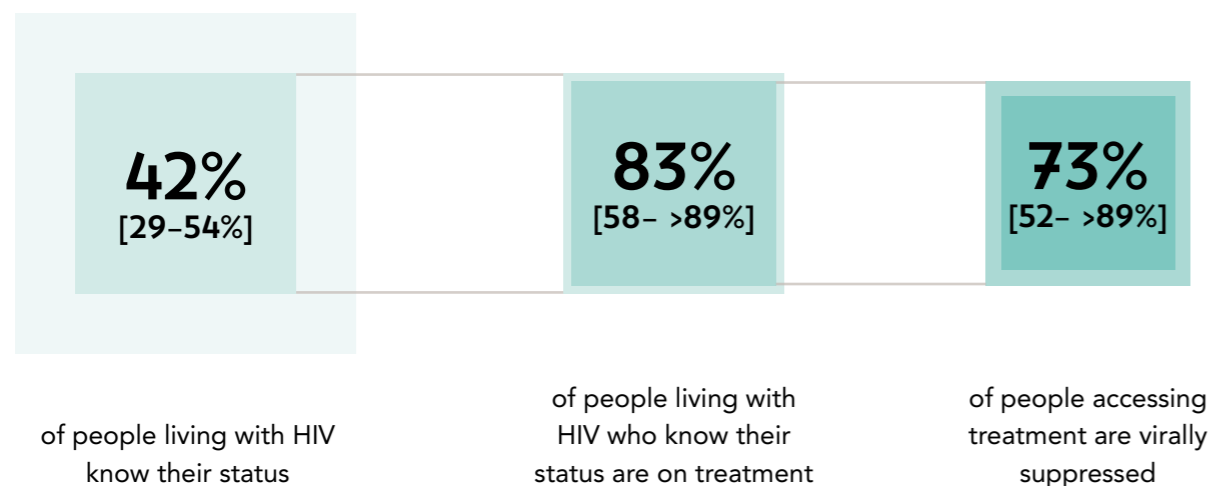


FIGURE 7.1. PROGRESS TOWARDS THE 90-90-90 TARGETS, WESTERN AND CENTRAL AFRICA, 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

Global efforts to reach the 90-90-90 targets are leaving millions behind in western and central Africa. A relatively high burden of HIV in the region, combined with HIV testing and treatment coverage far below the global average, paints an alarming picture: while it contains 7% of the world's population, the region is home to 17% of the world's people living with HIV and accounts for 30% of the world's AIDS-related deaths. A catch-up plan has been developed to accelerate the region's AIDS response.

## ADOPTING A TREAT ALL APPROACH

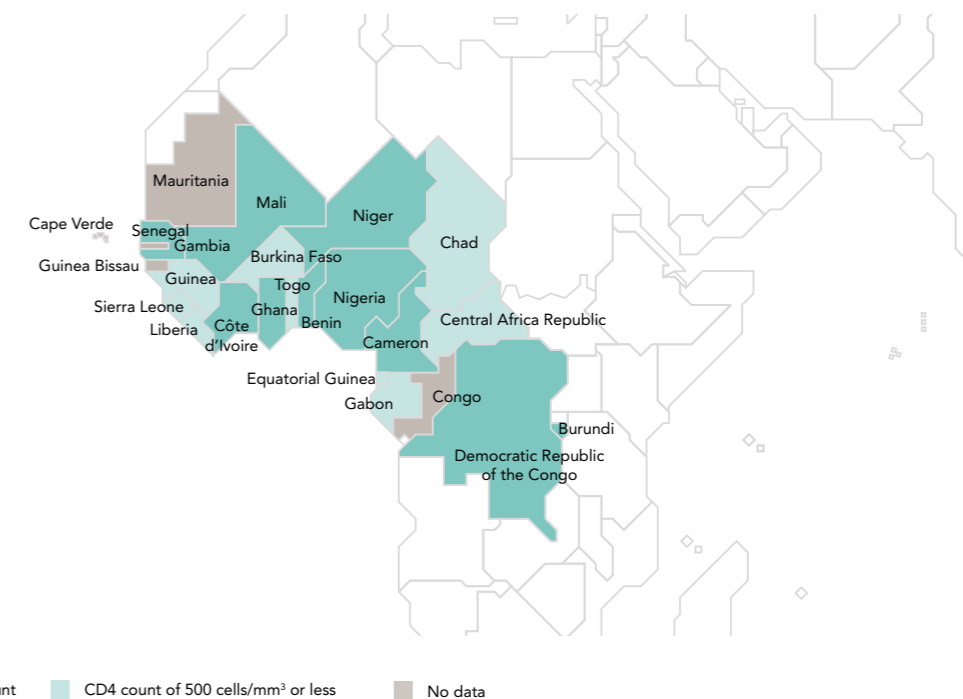


FIGURE 7.2. RECOMMENDED ANTIRETROVIRAL THERAPY INITIATION THRESHOLD AMONG PEOPLE LIVING WITH HIV PER MINISTRY OF HEALTH GUIDELINES, WESTERN AND CENTRAL AFRICA, BY COUNTRY, 2016

Ten of 24 countries in western and central Africa have adopted the World Health Organization recommendation that antiretroviral therapy should be initiated in every person living with HIV at any CD4 cell count.

Source: World Health Organization, 2017.

## AIDS-RELATED DEATHS REMAIN HIGH IN REGION

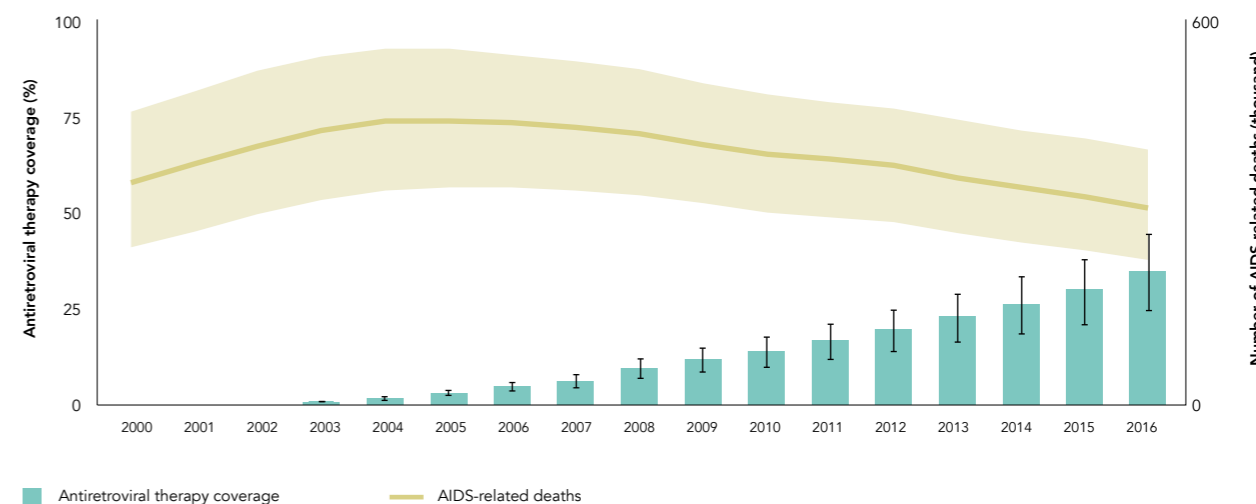


FIGURE 7.3. ANTIRETROVIRAL THERAPY COVERAGE AND NUMBER OF AIDS-RELATED DEATHS, WESTERN AND CENTRAL AFRICA, 2000-2016

The comparatively slow expansion of HIV treatment services has held back the reduction of AIDS-related deaths in western and central Africa. The epidemic claimed the lives of an estimated 310 000 [220 000-400 000] adults and children in 2016, 21% fewer than the estimated 390 000 [300 000-480 000] who died due to AIDS-related causes in 2010.

Source: 2017 Global AIDS Monitoring. UNAIDS 2017 estimates.

## HIV TESTING AND TREATMENT CASCADE IN WESTERN AND CENTRAL AFRICA

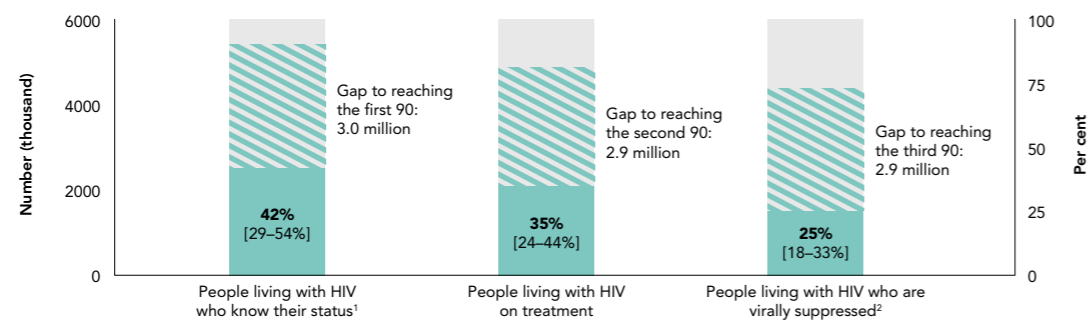


FIGURE 7.4. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, WESTERN AND CENTRAL AFRICA, 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

<sup>1</sup> 2016 measure derived from data reported by 13 countries, which accounted for 88% of people living with HIV in the region.

<sup>2</sup> 2016 measure derived from data reported by 14 countries. Regionally, 13% of all people on antiretroviral therapy were reported to have received a viral load test during the reporting period.

## CLOSING THE GAPS ACROSS THE HIV TESTING AND TREATMENT CASCADE

An estimated 42% [29–54%] of the 6.1 million [4.9 million–7.6 million] people living with HIV in western and central Africa were aware of their HIV status at the end of 2016. Among them, 83% [58–>89%] were accessing antiretroviral therapy, and of those on treatment, 73% [52–>89%] were virally suppressed (Figure 8.1). These data translate to treatment coverage of 35% [24–44%] and viral suppression of 25% [18–33%] among all people living with HIV in the region (Figure 7.4).

HIV testing and treatment programmes in the region have expanded in recent years, but a range of factors are holding back more rapid progress. Under-resourced health systems, staffing shortages and logistical weaknesses are common hindrances; so is the criminalization of key populations, their increased vulnerability to human rights violations, and the stigma and discrimination (including at health facilities) that they and people living with HIV experience. HIV services in western and central Africa have not been decentralized to the same extent as they have in eastern and southern Africa, which limits their reach; community involvement also has been uneven (1). In order to address this, countries in the region and the international community are jointly developing a catch-up plan that will rapidly accelerate and strengthen national responses to put countries on track to reach the 90–90–90 targets.

### Knowledge of HIV status

Knowledge of HIV status among people living with HIV in western and central Africa increased from 37% [26–47%] in 2015 to 42% [29–54%] in 2016 (Figure 7.5). In 2016, the gap to achieving the first 90 of the 90–90–90 targets was 3.0 million people living with HIV who did not know their status.

Provider-initiated testing and counselling at health facilities is the main approach being used in the region; community-based options are relatively rare (1). Stigma and discrimination, stock-outs of test kits, health-care worker shortages, insufficiently trained clinical staff and the imposition of user fees at clinics are undermining progress (1). Expanding the range of testing

options, however, could improve coverage. Door-to-door home-based testing (led by lay health workers and using rapid tests), linking HIV testing to multidisease health campaigns, and self-testing also are important approaches requiring scale-up (2–6). In the Democratic Republic of the Congo, for example, community-based testing and referrals have increased HIV diagnoses (1).

### Accessing HIV treatment

More than 2.1 million [1.9 million–2.2 million] people living with HIV in western and central Africa were accessing antiretroviral therapy in 2016, up from 860 000 [760 000–900 000] in 2010. This has translated into an increase in coverage from 13% [10–18%] of people living with HIV in the region accessing antiretroviral therapy in 2010 to an estimated 35% [24–44%] in 2016. The pace of scale-up must increase to reach 81% of all people living with HIV in the region by 2020. In 2016, the gap to fully achieving the second 90 was starting an additional 2.9 million people on treatment.

Progress varied among countries in the region. More than half of the people living with HIV in Benin, Burkina Faso, Burundi, Cabo Verde, Gabon, Senegal and Togo were accessing antiretroviral therapy in 2016. In Nigeria, however, which is home to more than half of people living with HIV in the region, coverage was only 30% [19–42%].

Paediatric treatment services also are faring poorly, with 22% [13–29%] of the estimated 550 000 [390 000–730 000] children (aged 0–14 years) living with HIV in 2016 accessing treatment. Laboratory facilities for early infant diagnosis are scarce, paediatric antiretroviral medicines are in short supply and many health staff are insufficiently trained to handle paediatric HIV diagnosis and care (1).

### Achieving viral suppression

The percentage of people living with HIV with suppressed viral loads was 25% [18–33%] in 2016 (Figure 7.5). The gap to full achievement of the 90–90–90 targets in 2016 was 2.9 million people living with HIV. Greater access to viral load testing is needed, as is greater use of point-of-care testing technologies and stronger systems for drug forecasting, procurement and supply management.

## GAINS ACROSS THE TREATMENT CASCADE

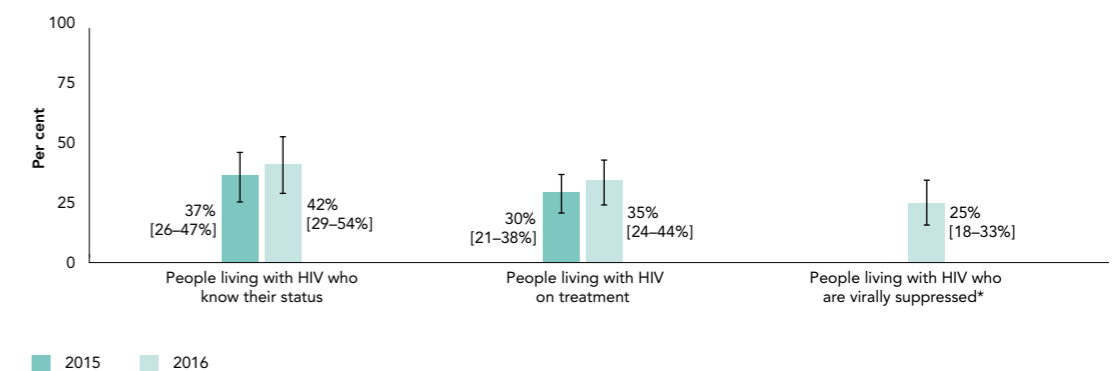


FIGURE 7.5. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, WESTERN AND CENTRAL AFRICA, 2015 AND 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

\*Insufficient data available for a 2015 estimate.

## HIV INFECTIONS AMONG CHILDREN DECLINED BY A THIRD; ADULTS REMAINED STABLE

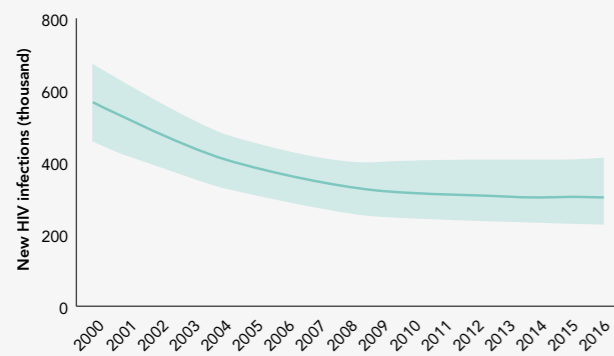


FIGURE 7.6. NEW HIV INFECTIONS AMONG ADULTS (AGED 15 YEARS AND OLDER), WESTERN AND CENTRAL AFRICA, 2000–2016

Source: UNAIDS 2017 estimates.

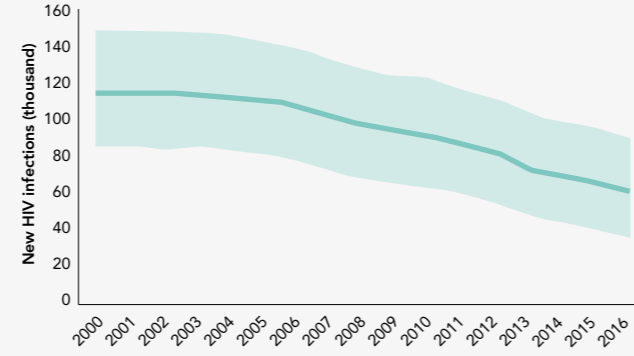


FIGURE 7.7. NEW HIV INFECTIONS AMONG CHILDREN (AGED 0–14 YEARS), WESTERN AND CENTRAL AFRICA, 2000–2016

Source: UNAIDS 2017 estimates.

The annual number of new infections among adults and children declined only slightly between 2010 and 2016, down from an estimated 400 000 [310 000–500 000] to 370 000 [270 000–490 000], a 9% reduction. New infections among adults (aged 15 years and older) during that period were stable at approximately 310 000 [220 000–410 000] per year. In contrast, the annual number of new infections among children (aged 0–14 years) decreased by 33% between 2010 and 2016, from 90 000 [62 000–120 000] to 60 000 [35 000–89 000], due primarily to increased coverage of services to prevent mother-to-child transmission.

Infection trends varied among countries in the region. In Congo, Ghana and Liberia, the annual number of new infections has increased by more than 15% over the last six years. By contrast, in Côte d'Ivoire—which accounted for 5% of new infections in the region in 2016—there has been a 20% decline in the annual number of new infections since 2010. In Nigeria, which accounted for 59% of new HIV infections in the region in 2016, new infections decreased by 6% between 2010 and 2016.

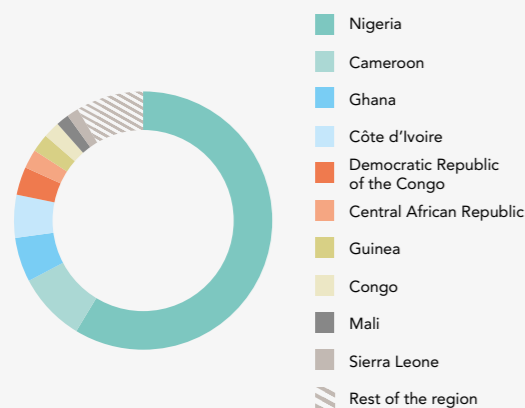


FIGURE 7.8. DISTRIBUTION OF NEW HIV INFECTIONS, BY COUNTRY, WESTERN AND CENTRAL AFRICA, 2016

Source: UNAIDS 2017 estimates.

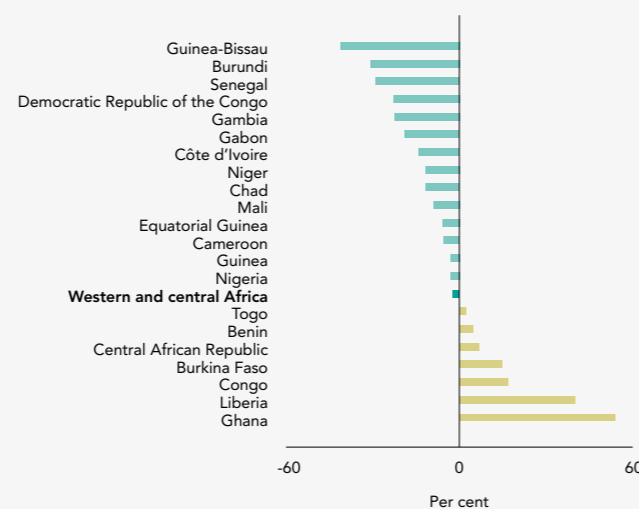


FIGURE 7.9. PERCENT CHANGE IN NEW HIV INFECTIONS, BY COUNTRY, WESTERN AND CENTRAL AFRICA, FROM 2010 TO 2016

Source: UNAIDS 2017 estimates.

## INVESTMENT IN THE AIDS RESPONSE

### SUBSTANTIAL FINANCING GAP IN WESTERN AND CENTRAL AFRICA

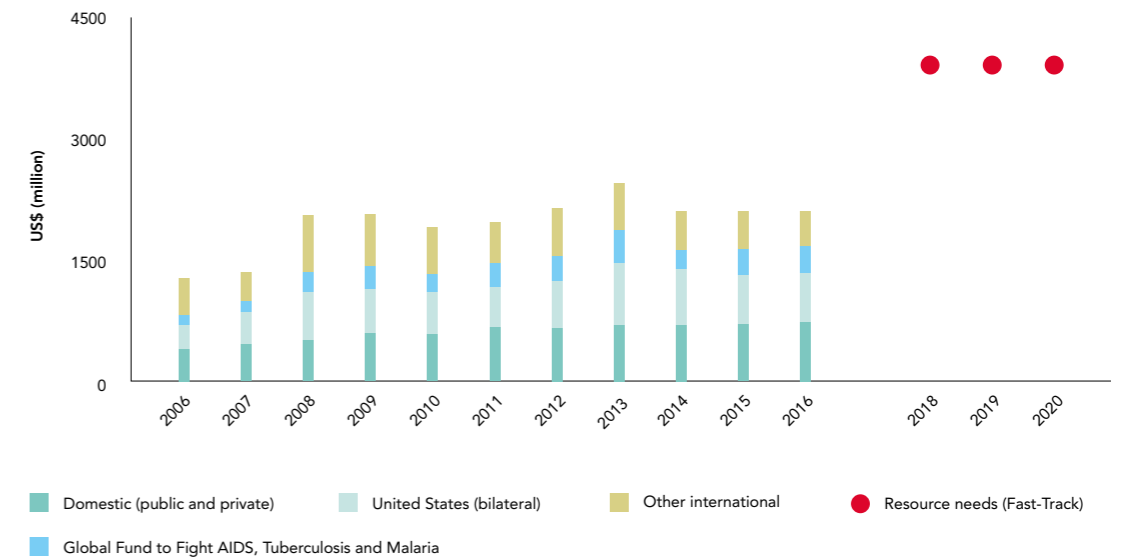


FIGURE 7.10. HIV RESOURCE AVAILABILITY BY SOURCE, 2006–2016, AND PROJECTED RESOURCE NEEDS BY 2020, WESTERN AND CENTRAL AFRICA\*

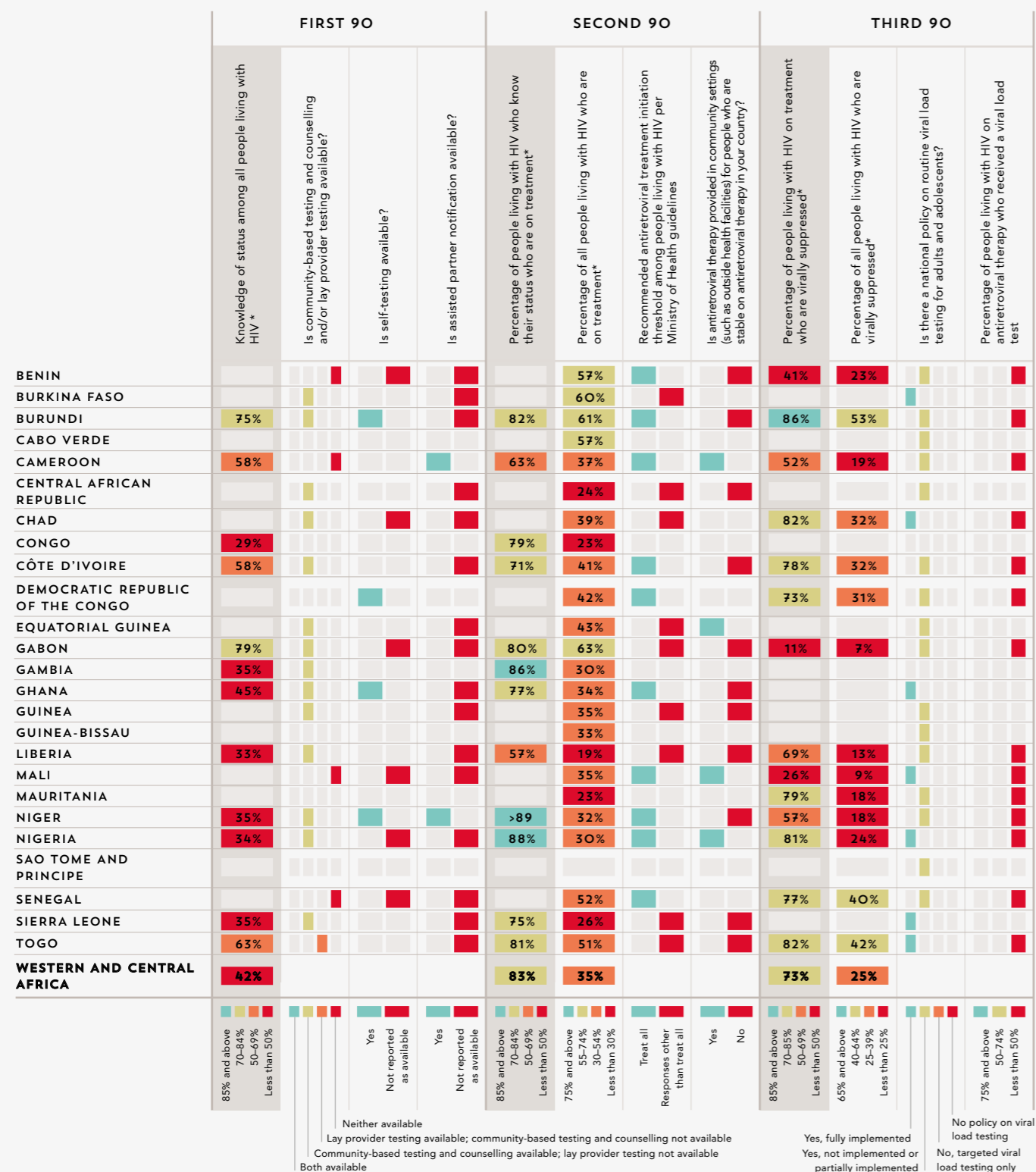
Source: UNAIDS estimates on HIV resource availability, June 2017. Fast-Track update on investments needed in the AIDS response, 2016–2030. Geneva: UNAIDS; 2016. Financing the response to low- and middle-income countries: international assistance from donor governments in 2016. The Henry J. Kaiser Family Foundation and UNAIDS (in press). GAM/GARPR reports (2005–2017). Philanthropic support to address HIV/AIDS in 2015. Washington, DC: Funders Concerned about AIDS; 2016.

\*Estimates for low- and middle-income countries per 2015 World Bank income level classification. All figures are expressed in constant 2016 US dollars.

Resources available for AIDS responses in the region increased by 65% from 2006 to 2016 (in constant 2016 US dollars), reaching an estimated US\$ 2.1 billion. Investment, however, was far lower than what is needed to achieve Fast-Track Targets by 2020 (Figure 7.10). Domestic investment reached its highest level to date in 2016, but it was still just 35% of the total resources available for the whole region. Most of the countries in the region are highly donor dependent, and sustained support from international donors will be needed for global targets to be met.

# 90-90-90 COUNTRY SCORECARDS

## WESTERN AND CENTRAL AFRICA



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Source: UNAIDS special analysis, 2017. 2017 Global AIDS Monitoring. UNAIDS 2017 estimates. 2017 National Commitments and Policy Instrument.  
\* The complete set of 90-90-90 measures and testing and treatment cascade data for countries can be found at [aidsinfo.unaids.org](http://aidsinfo.unaids.org).

# 8. ASIA AND THE PACIFIC

## PROGRESS TOWARDS THE 90-90-90 TARGETS

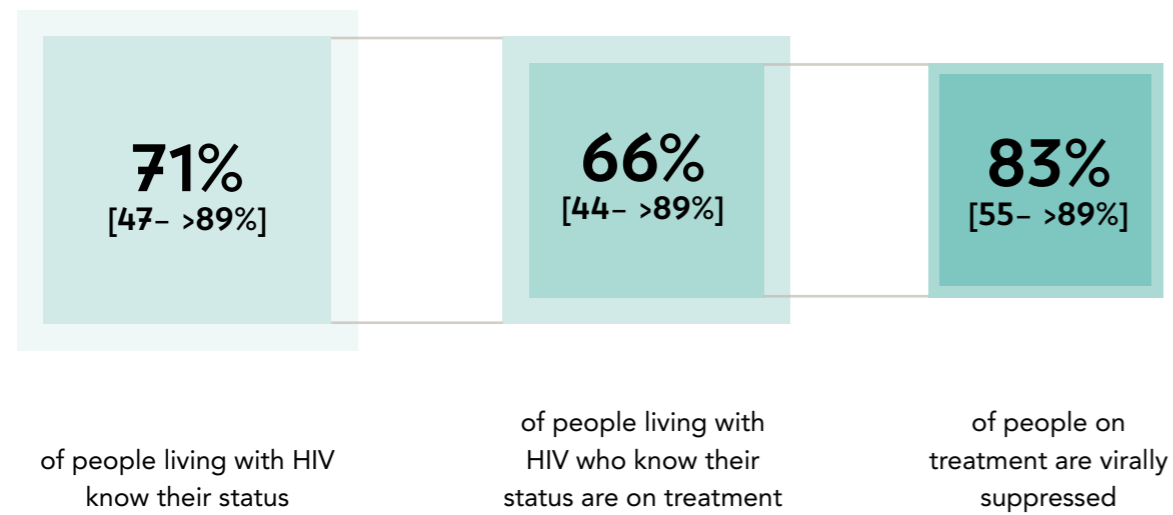


FIGURE 8.1. PROGRESS TOWARDS THE 90-90-90 TARGETS, ASIA AND THE PACIFIC, 2016  
Source: UNAIDS special analysis, 2017; see annex on methods for more details.

Domestic investments in AIDS responses across Asia and the Pacific have doubled over the last decade. More than two thirds of people living with HIV in the region were aware of their HIV status, and a similar proportion of those who knew their HIV status were on treatment. A remarkable four of five people accessing antiretroviral therapy in the region were virally suppressed in 2016.

## ADOPTING A TREAT ALL APPROACH

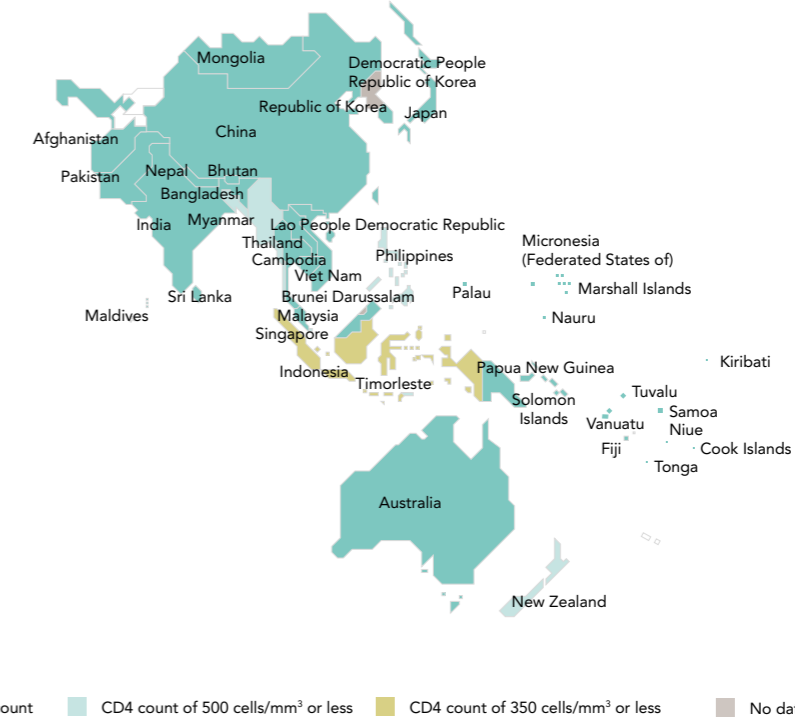


FIGURE 8.2. RECOMMENDED ANTIRETROVIRAL THERAPY INITIATION THRESHOLD AMONG PEOPLE LIVING WITH HIV PER MINISTRY OF HEALTH GUIDELINES, BY COUNTRY, ASIA AND THE PACIFIC, 2016

Thirty countries in Asia and the Pacific have adopted the World Health Organization recommendation that antiretroviral therapy should be initiated in every person living with HIV at any CD4 cell count. Treat all policies are being implemented nationally in 25 countries, including Afghanistan, Australia, Bhutan, Cambodia, China, Cook Islands, Fiji, India, Japan, Kiribati, Lao People's Democratic Republic, Malaysia, Mongolia, Nauru, Nepal, Niue, Palau, Republic of Korea, Samoa, Solomon Islands, Sri Lanka, Thailand, Tonga, Viet Nam and Vanuatu.

Source: World Health Organization, 2017.

## ONE-THIRD REDUCTION IN AIDS-RELATED DEATHS

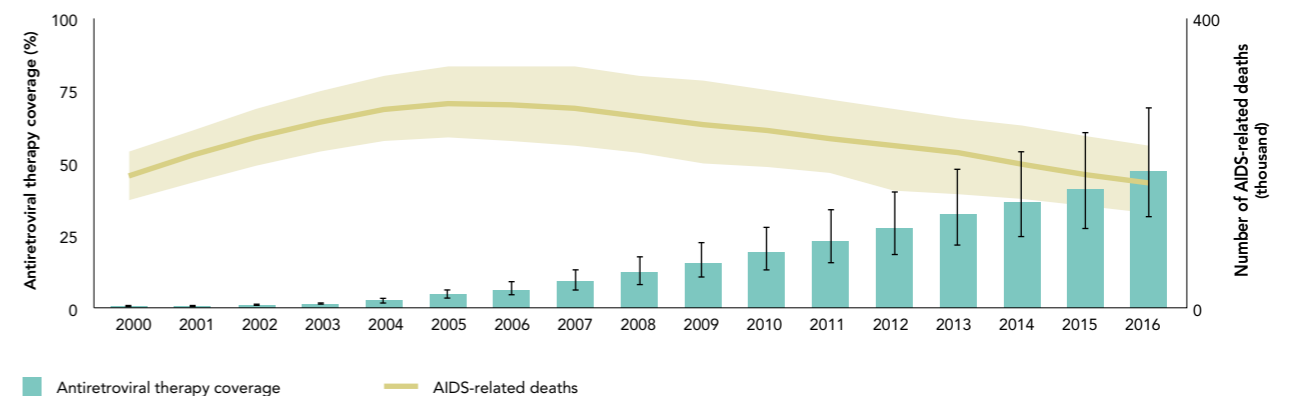


FIGURE 8.3. ANTIRETROVIRAL THERAPY COVERAGE AND NUMBER OF AIDS-RELATED DEATHS, ASIA AND THE PACIFIC, 2000-2016

The wider availability of antiretroviral therapy has led to a nearly one-third reduction in deaths from AIDS-related illnesses in the region, down from an estimated 240 000 [190 000-300 000] in 2010 to 170 000 [130 000-220 000] in 2016. AIDS-related deaths fell by an estimated 52% in Myanmar, while AIDS-related deaths in Indonesia increased by 68% and in Pakistan by 319%.

Source: 2017 Global AIDS Monitoring. UNAIDS 2017 estimates.

## HIV TESTING AND TREATMENT CASCADE IN ASIA AND THE PACIFIC

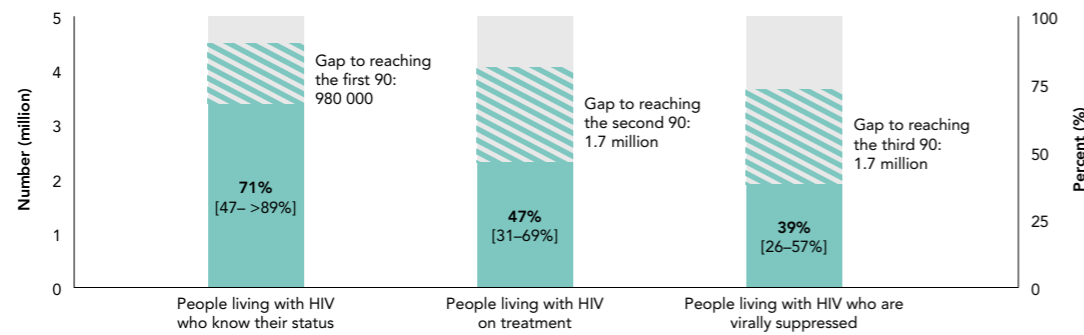


FIGURE 8.4. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, ASIA AND THE PACIFIC, 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

## CLOSING THE GAPS ACROSS THE HIV TESTING AND TREATMENT CASCADE

About 71% of the 5.1 million [3.9 million–7.2 million] people living with HIV in Asia and the Pacific at the end of 2016 were aware of their HIV status. Of those who knew their status, 66% [44–89%] were accessing antiretroviral therapy; among those on treatment, 83% [55–89%] were virally suppressed (Figure 8.1). These data translate into treatment coverage of 47% [31–69%] and viral suppression of 39% [26–57%] among all people living with HIV in the region (Figure 8.4).

### Knowledge of HIV status

Knowledge of HIV status among people living with HIV in Asia and the Pacific increased from 66% [44–89%] in 2015 to 71% [47–89%] in 2016 (Figure 8.5). In 2016, the gap to achieving the first 90 of the 90–90–90 targets was 980 000 people living with HIV who did not know their HIV status.

Progress varied between countries. Malaysia and Thailand have effectively reached the first 90, having diagnosed 96% and 91% of the estimated number of people living with HIV within their borders, respectively. Knowledge of HIV status among people living with HIV in India (77%) and Viet Nam (70%) was near the regional average, while just 35% of people living with HIV in Indonesia were aware of their status.

Recent behavioural survey data reported by 19 countries suggest that HIV testing coverage among key populations remained low, although the coverage levels vary widely by country and key population. According to the data, about half of sex workers, gay men and other men who have sex with men, people who inject drugs, and transgender people in the region had been tested for HIV within the previous 12 months and were aware of their HIV status.

Fifteen countries have introduced community-based HIV testing at pilot sites.<sup>1</sup>

### Accessing HIV treatment

About 2.4 million [2.1 million–2.5 million] people living with HIV in Asia and the Pacific were accessing antiretroviral therapy in 2016, up from 900 000 [800 000–950 000] in 2010. As the

<sup>1</sup> The 15 countries are Bangladesh, Cambodia, China, India, Lao People's Democratic Republic, Malaysia, Myanmar, Nepal, New Zealand, Papua New Guinea, the Philippines, Singapore, Sri Lanka, Thailand and Viet Nam.

total number of people living with HIV in the region has increased over the last six years, this scale-up has translated into an increase in treatment coverage from 19% [13–28%] in 2010 to an estimated 47% [31–69%] in 2016. Similar increases over the next four years would likely fall short of the target of 81% of all people living with HIV on treatment by 2020. In 2016, the gap to achieving the second 90 in the region was 1.7 million people living with HIV.

Available data point to low treatment coverage among key populations. In Pakistan, less than 10% of people living with HIV from certain key populations—female sex workers, gay men and other men who have sex with men, and people who inject drugs—were accessing antiretroviral therapy. Published studies from India also indicate very low treatment coverage: approximately 16% among men who have sex with men and 18% among people who inject drugs in 2012–2013 (1). Myanmar has reported that the results of behavioural surveys suggest that approximately 29% of female sex workers living with HIV were accessing HIV treatment, as were 47% of gay men and other men who have sex with men living with HIV.

### Achieving viral suppression

Among 16 countries in Asia and the Pacific that reported data on viral load testing to UNAIDS, 52% of people accessing antiretroviral therapy also had access to routine viral load testing.<sup>2</sup> The estimated percentage of people living with HIV who achieved viral suppression increased from 34% [23–50%] in 2015 to 39% [26–57%] in 2016 (Figure 8.5). In 2016, the gap to achieving the third 90 was the viral suppression of an additional 1.7 million people living with HIV.

Programme data show high retention rates for treatment, with over 85% of people accessing treatment after 12 months in Fiji, Malaysia, Mongolia, Myanmar, Nepal, New Zealand, Papua New Guinea, Singapore, Sri Lanka and Thailand. Lower levels of retention, ranging from 75% to 84%, were reported by Afghanistan, Bangladesh, Cambodia, Lao People's Democratic Republic and the Philippines.

Research in Jakarta, Indonesia, has shown that people with strong social support were 2.5 times more likely to adhere to treatment regimens over a three-month period compared to people who had less social support (2). In Indonesia, Myanmar and Nepal, nongovernmental organizations and community-based groups also are active in strengthening retention, but at a limited scale (3).

### GAINS ACROSS THE TREATMENT CASCADE

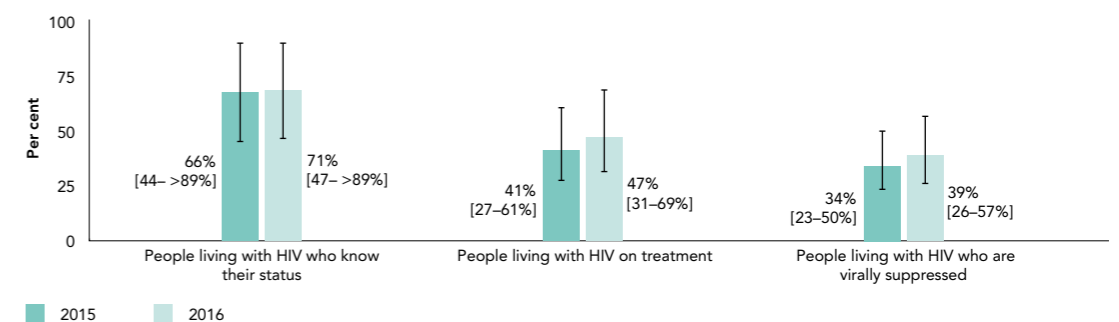


FIGURE 8.5. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, ASIA AND THE PACIFIC, 2015 AND 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

<sup>2</sup> The 16 countries were Afghanistan, Australia, Cambodia, Fiji, Kiribati, Lao People's Democratic Republic, Malaysia, Mongolia, Myanmar, Nepal, Pakistan, the Philippines, Samoa, Singapore, Thailand and Viet Nam.

## OVERALL DECLINES IN NEW HIV INFECTIONS HIDES A VARIETY OF COUNTRY TRENDS

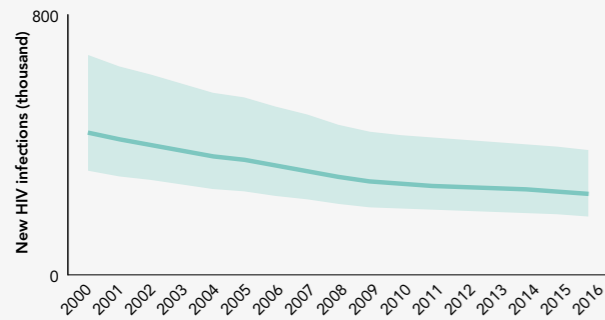


FIGURE 8.6. NUMBER OF NEW HIV INFECTIONS, ADULTS (AGED 15 YEARS AND OLDER), ASIA AND THE PACIFIC, 2010–2016

Source: UNAIDS 2017 estimates.

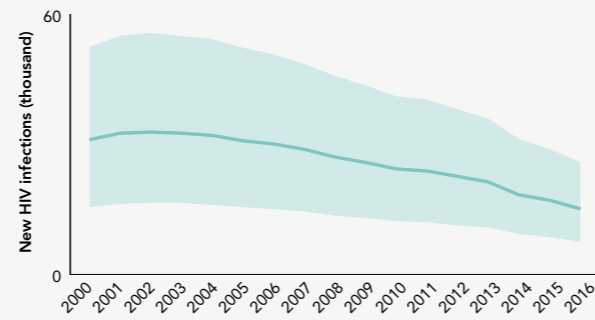


FIGURE 8.7. NUMBER OF NEW HIV INFECTIONS, CHILDREN (AGED 0–14 YEARS), ASIA AND THE PACIFIC, 2010–2016

Source: UNAIDS 2017 estimates.

The region's HIV epidemic remains largely concentrated among key populations, including sex workers and their clients, gay men and other men who have sex with men, people who inject drugs, and transgender people. The annual number of new HIV infections in Asia and the Pacific has declined 13% over the last six years, from 310 000 [220 000–430 000] in 2010 to 270 000 [190 000–370 000] in 2016. Trends vary from country to country. Steep reductions in annual new infections occurred in Thailand (50% decrease) Viet Nam (34% decrease) and Myanmar (26% decrease) between 2010 and 2016, while annual new infections climbed in Pakistan (39% increase) and the Philippines (141% increase) over the same period.

The majority of new infections are occurring in 10 countries: China, India, Indonesia, Malaysia, Myanmar, Pakistan, Papua New Guinea, the Philippines, Thailand and Viet Nam together accounted for more than 95% of all new HIV infections in the region in 2016.

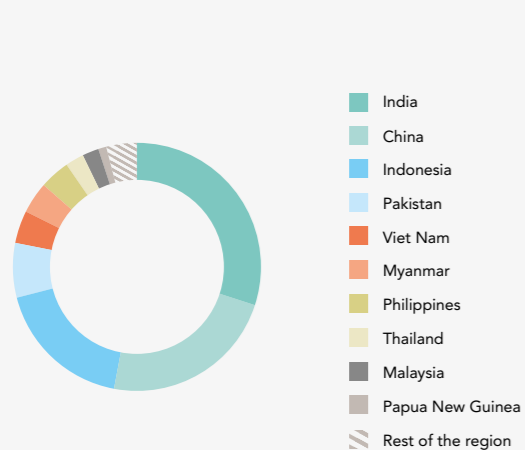


FIGURE 8.8. DISTRIBUTION OF NEW HIV INFECTIONS, BY COUNTRY, ASIA AND THE PACIFIC, 2016

Source: UNAIDS 2017 estimates.

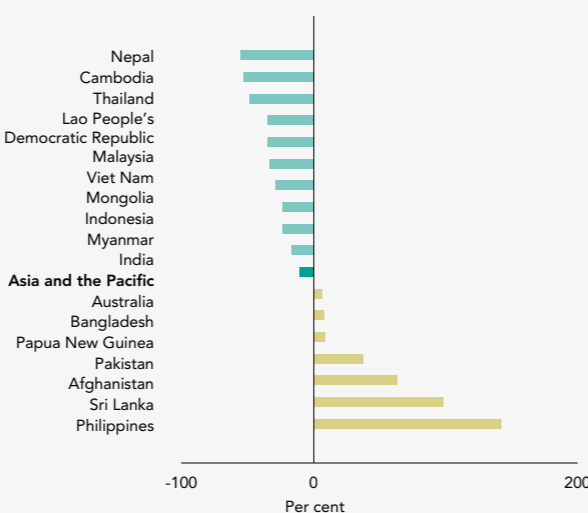


FIGURE 8.9. PERCENT CHANGE IN NEW HIV INFECTIONS, BY COUNTRY, ASIA AND THE PACIFIC, FROM 2010 TO 2016

Source: UNAIDS 2017 estimates.

## INVESTMENT IN THE AIDS RESPONSE

### DOMESTIC RESOURCES FOR HIV HAVE DOUBLED IN A DECADE

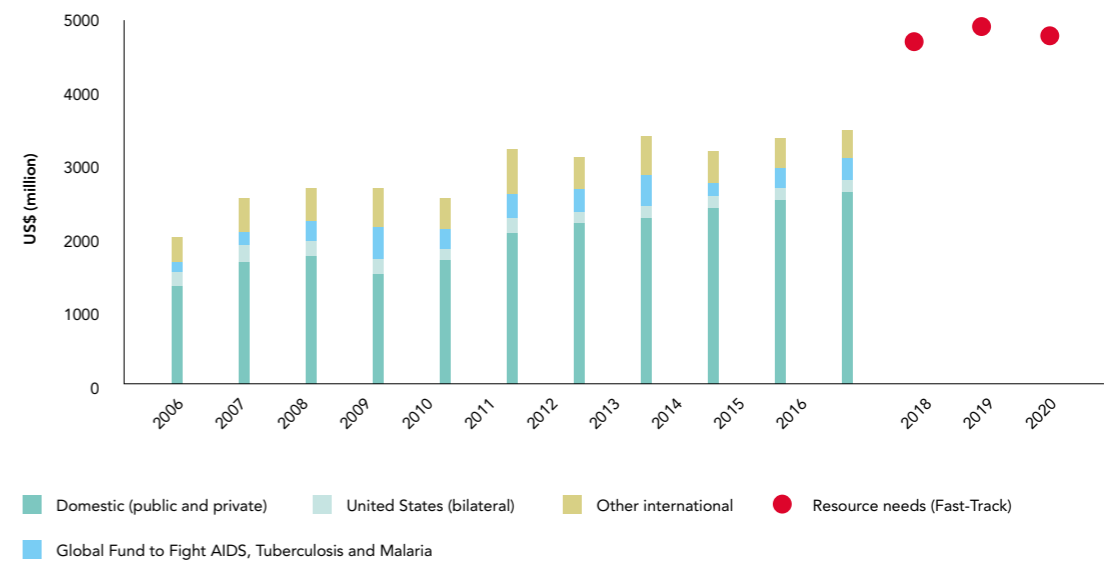


FIGURE 8.10. HIV RESOURCE AVAILABILITY BY SOURCE, 2006–2016, AND PROJECTED RESOURCE NEEDS BY 2020, ASIA AND THE PACIFIC\*

Source: UNAIDS estimates on HIV resource availability, June 2017. Fast-Track update on investments needed in the AIDS response, 2016–2030. Geneva: UNAIDS; 2016. Financing the response to low- and middle-income countries: international assistance from donor governments in 2016. The Henry J. Kaiser Family Foundation and UNAIDS (in press). GAM/GARPR reports (2005–2017). Philanthropic support to address HIV/AIDS in 2015. Washington, DC: Funders Concerned about AIDS; 2016. Shan D, Sun J, Yakusik A, et al. "Total HIV/AIDS Expenditures in Dehong Prefecture, Yunnan Province in 2010: The First Systematic Evaluation of Both Health and Non-Health Related HIV/AIDS Expenditures in China". PLoS ONE 8(6): e68006. <https://doi.org/10.1371/journal.pone.0068006>.

\*Estimates for low- and middle-income countries per 2015 World Bank income level classification. All figures are expressed in constant 2016 US dollars.

By the end of 2016, an estimated US\$ 3.6 billion was available for the AIDS response in Asia and the Pacific. While domestic resources for AIDS responses in the region have doubled over the last decade, international contributions fell by about 25% over the last five years as donors globally gave higher priority to countries that had higher disease burdens and lower ability to pay. Together, these trends have led the share of domestic resources over the last decade to increase from 67% to 75% of the total. Despite this large share of domestic investment, however, five of 17 reporting countries remained dependent on donors for more than 80% of the resources for their AIDS responses.

Additional resources are needed in the region. The current level of resources for AIDS responses is about 37% below the annual resources needed by 2020 to reach the Fast-Track Targets. Cost savings, efficiency gains in HIV services and investments in effective prevention services also are needed.

# JAKARTA

## CITY CASE STUDY

Indonesia is developing localized testing and treatment targets based on the 90-90-90 framework, including in the Special Capital Region, Daerah Khusus Ibukota (DKI) Jakarta. With a population of about 15 million, DKI Jakarta has an epidemic concentrated primarily among female sex workers and their clients, gay men and other men who have sex with men, people who inject drugs, and waria (transgender women). There were an estimated 4100 new HIV infections in the city in 2016, over 80% of them among key populations, according to 2016 modelling conducted by the Jakarta Provincial Health Office.

The DKI Jakarta Health Office is overhauling the city-wide HIV programme. Local government budgets for HIV programmes have increased, prevention activities are being focused in high-prevalence areas and HIV services are being decentralized to district primary health centres. Closer collaboration

with nongovernmental organizations is improving case finding and providing more rapid linkages to treatment for members of key populations who are diagnosed with HIV. Decentralization also has facilitated the tailoring of services for key populations: opening hours were extended at five clinics that serve gay and other men who have sex with men, and 14 primary health centres are now offering redesigned services that are more client-friendly.

The results are encouraging. Programme data since 2014 show consistent increases in the numbers of gay men and other men who have sex with men being tested, diagnosed and linked to treatment and care services, as well as those who are on antiretroviral therapy and remaining in treatment (Figure 8.11).

*Programme data were provided by the Jakarta Provincial Health Office.*

### REACHING KEY POPULATIONS WITH SERVICES

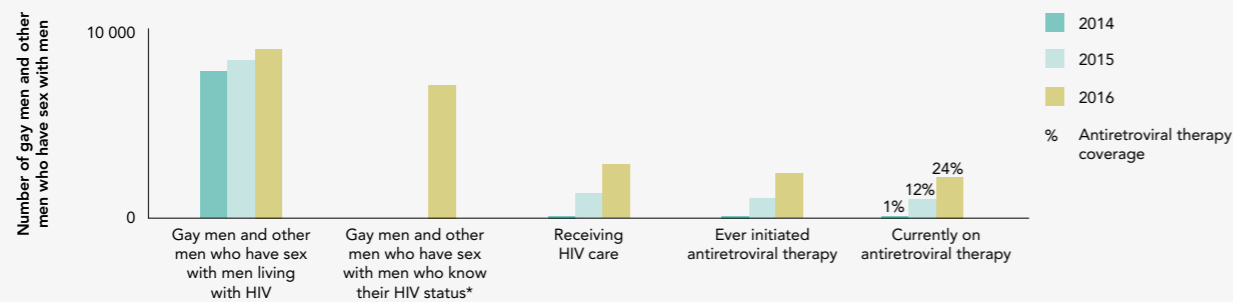


FIGURE 8.11. HIV CARE AND TREATMENT CASCADE, GAY MEN AND OTHER MEN WHO HAVE SEX WITH MEN, DAERAH KHUSUS IBUKOTA JAKARTA, 2014-2016

Source: SIHA Dinkes Provinsi DKI Jakarta, retrieved on 31 January 2017, DKI Jakarta AEM Baseline workbook, 2 September 2015.

\*Number of gay men and other men who have sex with men living with HIV who were diagnosed between 2014 and 2016.

# 90-90-90 COUNTRY SCORECARDS ASIA AND THE PACIFIC

	FIRST 90				SECOND 90				THIRD 90			
	Knowledge of status among all people living with HIV *	Is community-based testing and counselling and/or lay provider testing available?	Is self-testing available?	Is assisted partner notification available?	Percentage of people living with HIV who know their status who are on treatment*	Percentage of all people living with HIV who are on treatment*	Recommended antiretroviral treatment initiation threshold among people living with HIV per Ministry of Health guidelines	Is antiretroviral therapy provided in community settings (such as outside health facilities) for people who are stable on antiretroviral therapy in your country?	Percentage of people living with HIV on treatment who are virally suppressed*	Percentage of all people living with HIV who are virally suppressed*	Is there a national policy on routine viral load testing for adults and adolescents?	Percentage of people living with HIV on antiretroviral therapy who received a viral load test
AFGHANISTAN	29%				26%	7%			86%	6%		
AUSTRALIA	>89%				>89%	>81%			79%	71%		
BANGLADESH	34%				46%	16%						
BHUTAN												
BRUNEI DARUSSALAM												
CAMBODIA	82%				>89%	80%			>89%	>73%		
CHINA					74%							
COOK ISLANDS												
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA												
FIJI	87%				36%	32%			42%	13%		
INDIA	77%				63%	49%						
INDONESIA	35%				36%	13%						
JAPAN												
KIRIBATI <sup>1</sup>						26%			33%	9%		
LAO PEOPLE'S DEMOCRATIC REPUBLIC						41%			78%	32%		
MALAYSIA	>89%				39%	37%			>89%	35%		
MALDIVES <sup>1</sup>						>81%						
MARSHALL ISLANDS												
MICRONESIA <sup>1</sup> (FEDERATED STATES OF)						21%						
MONGOLIA	35%				>89%	33%			86%	29%		
MYANMAR						55%			>89%	51%		
NAURU												
NEPAL	56%				72%	40%			88%	36%		
NEW ZEALAND												
NIUE												
PAKISTAN						7%			65%	4%		
PALAU												
PAPUA NEW GUINEA	81%				64%	52%						
PHILIPPINES	67%				48%	32%			>89%	29%		
REPUBLIC OF KOREA												
SAMOA <sup>1</sup>						>81%			57%	57%		
SINGAPORE <sup>1</sup>						>81%			>89%	>73%		
SOLOMON ISLANDS												
SRI LANKA	47%				56%	27%						
THAILAND	>89%				75%	69%			79%	54%		
TIMOR-LESTE												
TONGA												
TUVALU												
VANUATU												
VIET NAM	70%				67%	47%			73%	34%		
ASIA AND THE PACIFIC	71%				66%	47%			83%	39%		

Source: UNAIDS special analysis, 2017. 2017 Global AIDS Monitoring. UNAIDS 2017 estimates. 2017 National Commitments and Policy Instrument.

\* The complete set of 90-90-90 measures and testing and treatment cascade data for countries can be found at [aidsinfo.unaids.org](http://aidsinfo.unaids.org).

<sup>1</sup> Estimates of people living with HIV that inform progress towards 90-90-90 are country-supplied and have not been validated by UNAIDS.



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3. Progress report on HIV in the WHO South-East Asia Region, 2016. Delhi: World Health Organization; 2016.

# 9. LATIN AMERICA

## PROGRESS TOWARDS THE 90-90-90 TARGETS



FIGURE 9.1. PROGRESS TOWARDS THE 90-90-90 TARGETS, LATIN AMERICA, 2016  
Source: UNAIDS special analysis, 2017; see annex on methods for more details.

Strong progress across the 90-90-90 continuum has been achieved in Latin America. Reaching the targets by 2020 will require additional domestic investments that are focused on community-centred approaches that increase HIV diagnoses, particularly among key populations and their sex partners, and on service improvements that enable more people living with HIV to start antiretroviral therapy promptly.

## ADOPTING A TREAT ALL APPROACH



■ Treat all regardless of CD4 count ■ CD4 count of 500 cells/mm<sup>3</sup> or less ■ CD4 count of 350 cells/mm<sup>3</sup> or less

FIGURE 9.2. RECOMMENDED ANTIRETROVIRAL THERAPY INITIATION THRESHOLD AMONG PEOPLE LIVING WITH HIV PER MINISTRY OF HEALTH GUIDELINES, BY COUNTRY, LATIN AMERICA, 2016

Argentina, Bolivia (Plurinational State of), Brazil, Costa Rica, Mexico, Paraguay, Uruguay and Venezuela (Bolivarian Republic of) have adopted the World Health Organization recommendation that antiretroviral therapy should be initiated in every person living with HIV at any CD4 cell count.

Source: World Health Organization, 2017.

## AIDS-RELATED DEATHS DECLINING IN LATIN AMERICA DESPITE WORRYING INCREASES IN SOME COUNTRIES

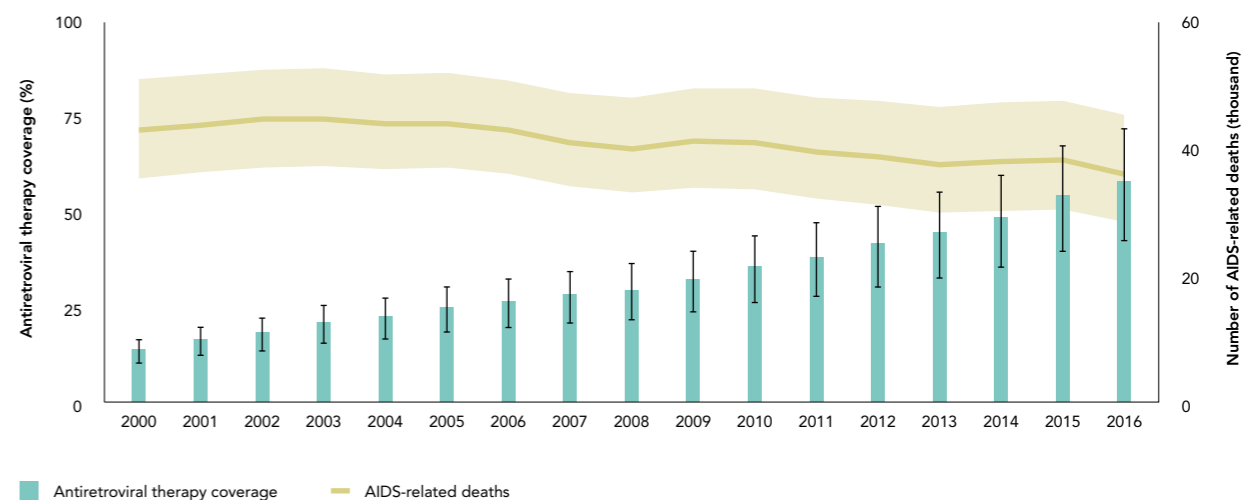


FIGURE 9.3. ANTIRETROVIRAL THERAPY COVERAGE AND NUMBER OF AIDS-RELATED DEATHS, LATIN AMERICA, 2000-2016

Relatively high and rising HIV treatment coverage has played a primary role in reducing AIDS-related mortality by about 12%, from an estimated 43 000 [35 000-51 000] in 2000 to 36 000 [28 000-45 000] in 2016. The bulk of the decline was achieved in Peru, Honduras and Colombia, where AIDS-related deaths declined by 62%, 58% and 45%, respectively. AIDS-related death rates were still rising in a number of countries, notably Guatemala and Paraguay.

Source: 2017 Global AIDS Monitoring. UNAIDS 2017 estimates.

## HIV TESTING AND TREATMENT CASCADE IN LATIN AMERICA

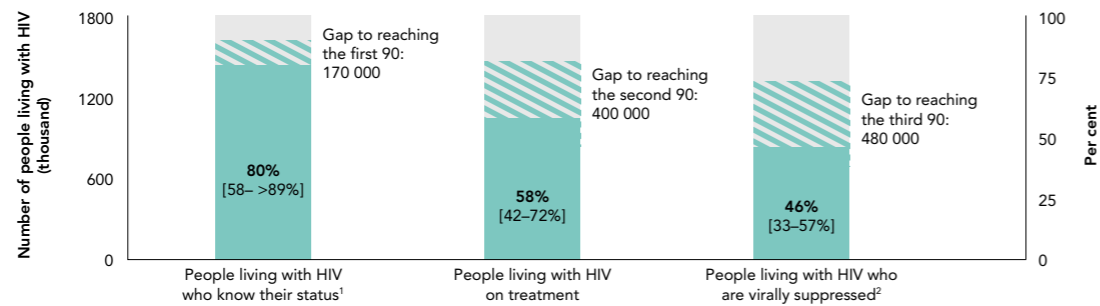


FIGURE 9.4. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, LATIN AMERICA, 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

<sup>1</sup> 2016 measure derived from data reported by 14 countries, which accounted for 87% of people living with HIV in Latin America.

<sup>2</sup> 2016 measure derived from data reported by 14 countries. Regionally, 87% of all people on antiretroviral therapy were reported to have received a viral load test during the reporting period.

## CLOSING THE GAPS ACROSS THE HIV TESTING AND TREATMENT CASCADE

Four of five people living with HIV in Latin America at the end of 2016 were aware of their HIV status. Of those who knew their status, 72% [52- >89%] were accessing antiretroviral therapy; this is equivalent to 58% [42-72%] of all people living with HIV in the region. Among those who were accessing treatment, 79% [57- >89%] were virally suppressed, which translates into 46% [33-57%] of all people living with HIV in the region (Figure 9.4).

### Knowledge of HIV status

Knowledge of HIV status among the 1.8 million [1.4 million-2.1 million] people living with HIV in Latin America reached 81% [58- >89%] in 2016, up from 77% [56- >89%] in 2015 (Figure 9.5). In 2016, the gap to achieving the first 90 of the 90-90-90 targets was 170 000 people living with HIV who did not know their HIV status. Late diagnosis continues to undermine the impact of treatment efforts, however, with around one in three people diagnosed with advanced disease (CD4 count of under 200 cells/mm<sup>3</sup>).

Continued progress calls for an additional focus on community-centred approaches that increase HIV diagnoses, particularly among key populations and their sex partners, and on service improvements that enable more people living with HIV to start antiretroviral therapy promptly. HIV self-testing holds great promise for increasing HIV diagnoses, especially for populations that may be reluctant to access public health services (1). In Peru, self-testing kits have been available at pharmacies since 2013, and studies indicate a high acceptability of this approach, albeit with possible concerns about low linkages to care and the high cost of test kits (2). In Honduras, the Ministry of Health has established VICITS, an outreach strategy that focuses on key populations. The programme features after-hours services at four health facilities, while a mobile unit provides services at additional clinics, universities and other venues. Within a year, HIV testing uptake at the four facilities doubled among gay men and other men who have sex with men and tripled among transgender women (3).

### Accessing HIV treatment

The number of people accessing antiretroviral therapy in Latin America has nearly doubled in six years, from 511 700 [450 300-532 100] in 2010 to an estimated 1.0 million [896 000-1.1 million] people in 2016. Similar gains over the next four years would likely achieve the second 90. In 2016, the gap to achieving that target was starting an additional 400 000 people on antiretroviral therapy.

An estimated 58% [42-72%] of people living with HIV in the region were accessing antiretroviral therapy in 2016, which is above the global average of 53% [39-65%]. Treatment coverage was highest in Argentina at 64% [58-70%], followed by two countries with relatively large populations of people living with HIV: Brazil (60% [38-81%]) and Mexico (60% [48-69%]).

A few countries in the region are struggling to scale up their treatment programmes. In the Plurinational State of Bolivia, only 25% [15-36%] of people living with HIV were accessing treatment in 2016; in Paraguay, 35% [23-70%] of people living with HIV were on treatment. In Guatemala, just over one third of people living with HIV were on treatment. In the Bolivarian Republic of Venezuela, an economic crisis has led to shortages of many essential medicines, including antiretroviral drugs (4).

Affordability is a major issue. Several of the countries with the largest HIV epidemics in the region continue to pay high prices for some second-line and third-line treatment regimens. Two countries, Brazil and Ecuador, have issued compulsory licenses for antiretroviral drugs. Brazil issued a compulsory licence for efavirenz in 2007, which was used by one third of Brazilians who are on treatment through the national programme. After the licence was issued, the price for the imported generic version dropped from US\$ 1.60 per dose to US\$ 0.45 per dose (5). At the end of 2016, 87% of all people on treatment in the country were using regimens with efavirenz. The Government of Ecuador has issued compulsory licences for six antiretroviral drugs, including ritonavir and lopinavir (6).

### Achieving viral suppression

Among the 14 countries in the region that reported routine viral load testing data to UNAIDS, nearly all (87%) people on treatment in the region in 2016 had access to viral load testing.

Approximately 79% [57- >89%] of people accessing treatment in Latin America were virally suppressed in 2016, similar to levels in 2015 (Figure 9.5). In 2016, the gap to achieving the 73% viral suppression target required an additional 480 000 people living with HIV in the region to be virally suppressed.

The available data point to weaker treatment adherence among female sex workers, people who inject drugs, and gay men and other men who have sex with men (7). Discrimination and harassment against key populations undermine their retention in HIV care; unreliable supply and distribution are additional hindrances (8).

## GAINS ACROSS THE TREATMENT CASCADE

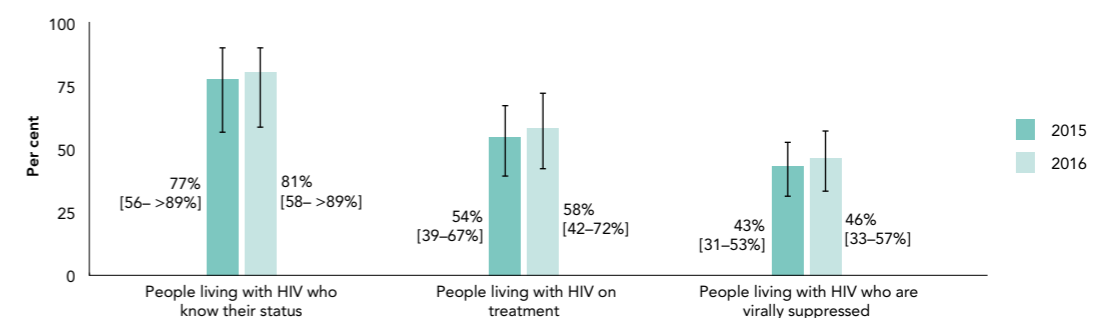


FIGURE 9.5. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, LATIN AMERICA, 2015 AND 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

## STABLE REGIONAL TREND IN NEW INFECTIONS HIDES DIFFERENCES AMONG COUNTRIES

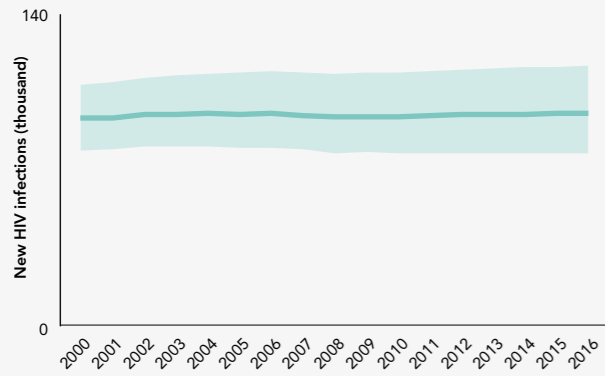


FIGURE 9.6. NUMBER OF NEW HIV INFECTIONS, ADULTS AGED (15 YEARS AND OLDER), LATIN AMERICA, 2010–2016

Source: UNAIDS 2017 estimates.

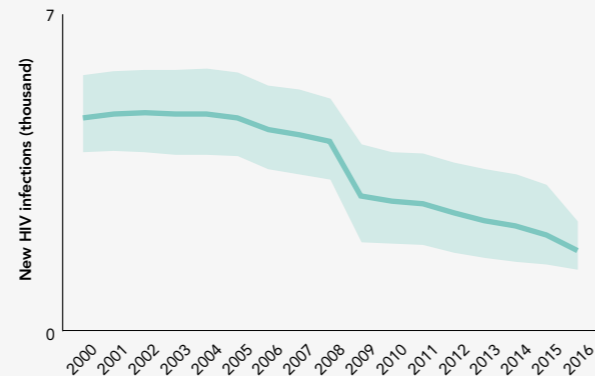


FIGURE 9.7. NUMBER OF NEW HIV INFECTIONS, CHILDREN (AGED 0–14 YEARS), LATIN AMERICA, 2010–2016

Source: UNAIDS 2017 estimates.

The annual number of new HIV infections among adults in Latin America has remained stable since 2010: an estimated 96 000 [78 000–120 000] new infections occurred in 2016, compared to 94 000 [78 000–110 000] in 2010. There were an estimated 1800 [1300–2400] new HIV infections in children in 2016, the majority of them in the Bolivarian Republic of Venezuela, Brazil and Guatemala.

Trends vary considerably among countries. While new infections have decreased by more than 20% in Colombia, El Salvador, Nicaragua and Uruguay since 2010, they increased slightly in Argentina and Brazil (3%) over the same period. There were large increases in Chile (34%) and a number of central American countries, notably Guatemala (23%), Costa Rica (16%), Honduras (11%) and Panama (9%) between 2010 and 2016.

About 90% of new infections in 2016 in Latin America occurred in seven countries, with nearly half (49%) in Brazil. Mexico was the next highest, with 13% of new infections.



FIGURE 9.8. DISTRIBUTION OF NEW HIV INFECTIONS, BY COUNTRY, LATIN AMERICA, 2016

Source: UNAIDS 2017 estimates.

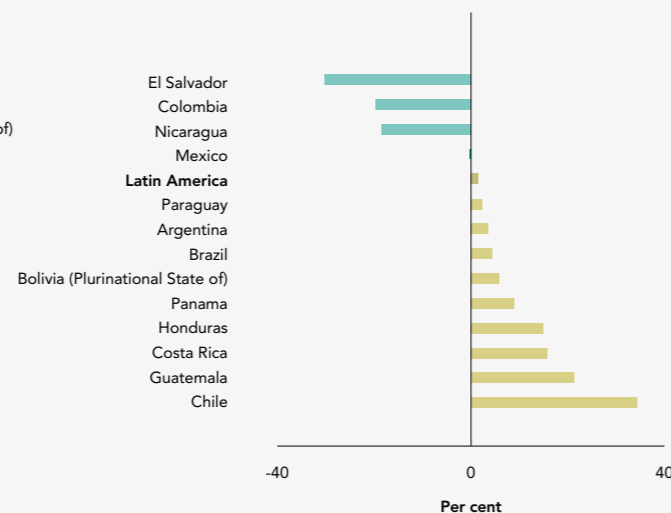


FIGURE 9.9. PERCENT CHANGE IN NEW HIV INFECTIONS, BY COUNTRY, LATIN AMERICA, FROM 2010 TO 2016

Source: UNAIDS 2017 estimates.

## INVESTMENT IN THE AIDS RESPONSE

### MORE RESOURCES NEEDED TO REACH FAST-TRACK TARGETS



FIGURE 9.10. HIV RESOURCE AVAILABILITY BY SOURCE, 2006–2016, AND PROJECTED RESOURCE NEEDS BY 2020, LATIN AMERICA\*

Source: UNAIDS estimates on HIV resource availability, June 2017. Fast-Track update on investments needed in the AIDS response, 2016–2030. Geneva: UNAIDS; 2016. Financing the response to low- and middle-income countries: international assistance from donor governments in 2016. The Henry J. Kaiser Family Foundation and UNAIDS (in press). GAM/GARPR reports (2005–2017). Philanthropic support to address HIV/AIDS in 2015. Washington, DC: Funders Concerned about AIDS; 2016.

\*Estimates for low- and middle-income countries per 2015 World Bank income level classification. All figures are expressed in constant 2016 US dollars.

Total resources for the HIV response in the region increased by 139% between 2006 and 2016, from around US\$ 1 billion to US\$ 2.6 billion (in constant 2016 US dollars). An additional 22% increase will be needed to reach the level of funding required to reach the Fast-Track Targets for 2020. If these resources are front-loaded and used effectively, resource needs will peak by 2018 at US\$ 3.2 billion and then steadily decrease. Efficiency gains, price reductions for commodities, and allocative and technical efficiencies—along with other cost containments that do not affect quality of service delivery—will be needed to secure a financially sustainable response that is capable of ending AIDS as a public health threat by 2030.

A large share of domestic funding is allocated for HIV treatment and care. By contrast, many prevention programmes that focus on key populations in the region rely substantially on donor funding. As donor funding in the region continues to decline, increased domestic funding will be sorely needed to sustain prevention programmes in donor-dependent countries.

# BUENOS AIRES

## CITY CASE STUDY

Reducing sexual and HIV-related stigma, diagnosing greater numbers of people living with HIV and promptly linking them to care are priorities of the HIV programme in Buenos Aires, one of the Fast-Track cities in Latin America. The Rapid HIV Test in the Neighbourhoods campaign has been offering people free rapid HIV tests at mobile health clinics that have been set up at 34 public spaces frequented by commuters. Started in 2014, the service includes pre- and post-test counselling. Individuals who test HIV-positive are immediately referred to a specialized hospital.

Buenos Aires has acted against stigma and discrimination by introducing a by-law (4.238/12) that ensures that health-care providers do not refuse adolescents services based on gender identity or sexual orientation. Within this legal environment, the city has assembled a network of rights-based health services specifically intended for trans populations. This network is comprised of eight hospitals, 23 health centres, one mental health centre and six nongovernmental organizations.

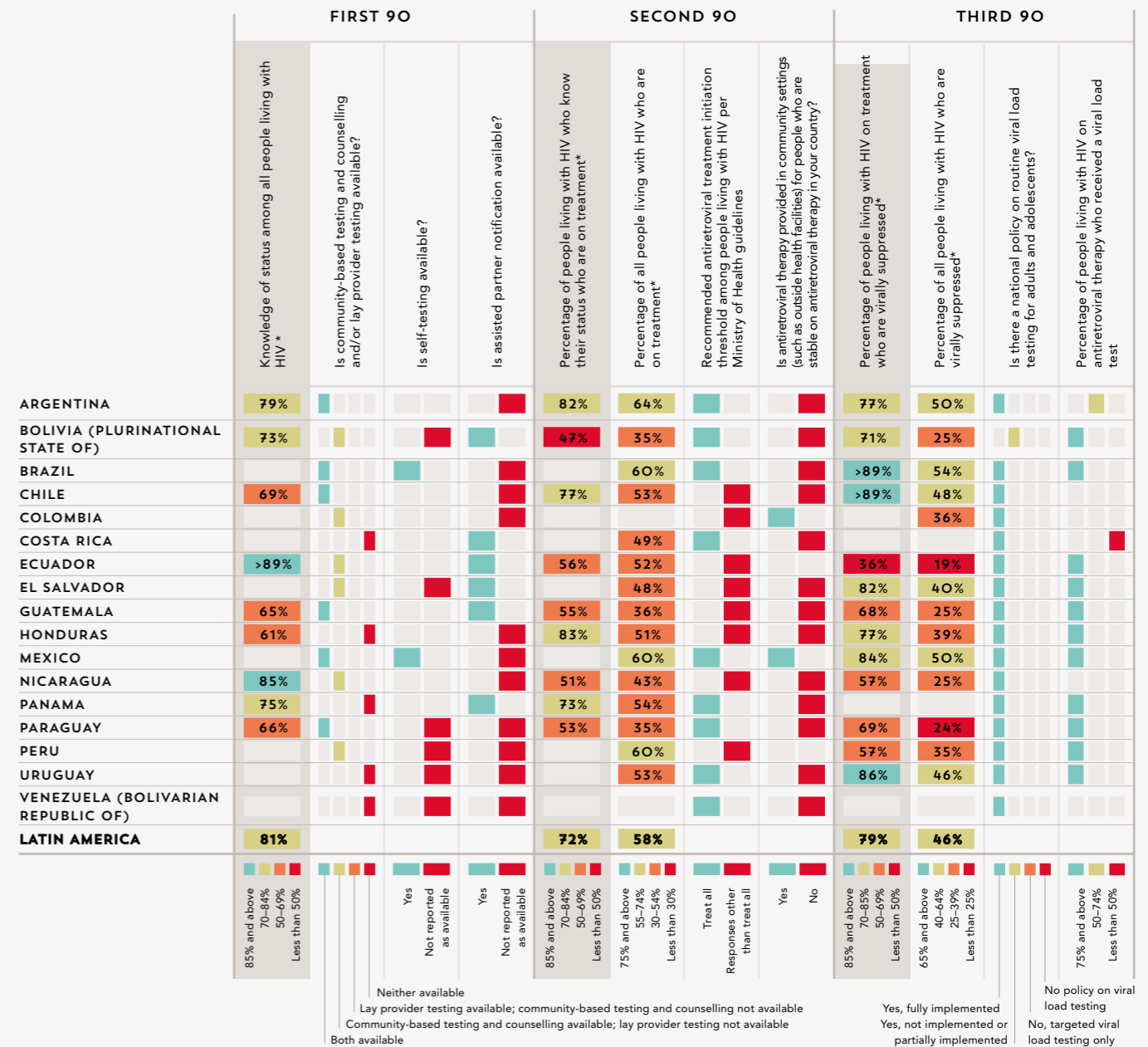
Also proving popular in the city is Chau-tabú ("Goodbye taboo"), a web-based service that offers young people a safe space to seek sexual

education and counselling. It also provides information on adolescent-friendly clinics where young people can access services for HIV testing and treatment, addiction management, sexual education and other counselling. The site has had more than 430 000 visits since it was set up in 2013, mostly from teenagers, and it is helping reduce stigma around sex, sexuality and HIV among young people in Buenos Aires (9).

The Argentinian Network of Young People and Adolescents living with HIV (RAJAP) provides peer support to young people living with HIV. Every week, one or two new members join the network in the city of Buenos Aires, where they become part of a group of young people who talk about their lives and share experiences with peers. The peer-to-peer support that is provided to the members is particularly important for treatment adherence, and it encourages young people living with HIV to stay strong and continue with their treatment when they want to stop taking their antiretroviral medicines. RAJAB also contributes to the protection of human rights of young people living with HIV: it collects human rights-related queries and complaints from its members and the general public and channels them to the appropriate state agencies so that corrective action can be taken.



# 90-90-90 COUNTRY SCORECARDS LATIN AMERICA



\* The complete set of 90-90-90 measures and testing and treatment cascade data for countries can be found at [aidsinfo.unaids.org](http://aidsinfo.unaids.org). Source: UNAIDS special analysis, 2017. 2017 Global AIDS Monitoring. UNAIDS 2017 estimates. 2017 National Commitments and Policy Instrument.

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# 10. CARIBBEAN

## PROGRESS TOWARDS THE 90-90-90 TARGETS

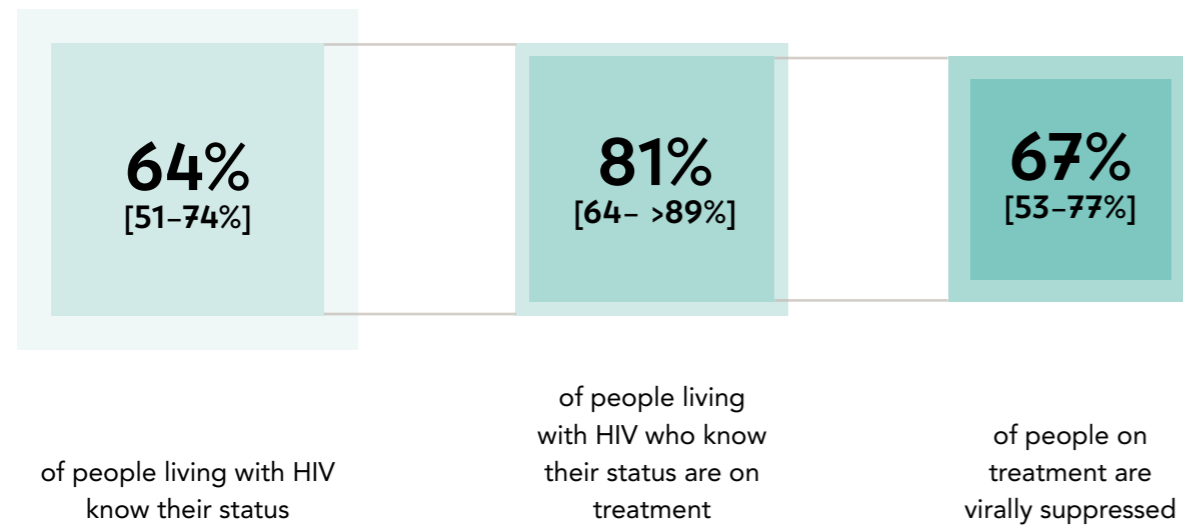


FIGURE 10.1. PROGRESS TOWARDS THE 90-90-90 TARGETS, CARIBBEAN, 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

More than four of five people living with HIV in the Caribbean who know their HIV status are accessing antiretroviral therapy. However, late diagnosis of HIV infection remains a challenge, particularly for men, and there continue to be barriers to treatment access for young people and key populations. The percentage of people on treatment with suppressed viral load is also well below the global average. Caribbean countries are using revised tendering and purchasing processes and pooled procurement to lower the cost of antiretroviral medicines and to counter declines in external funding for AIDS responses.

## ADOPTING A TREAT ALL APPROACH

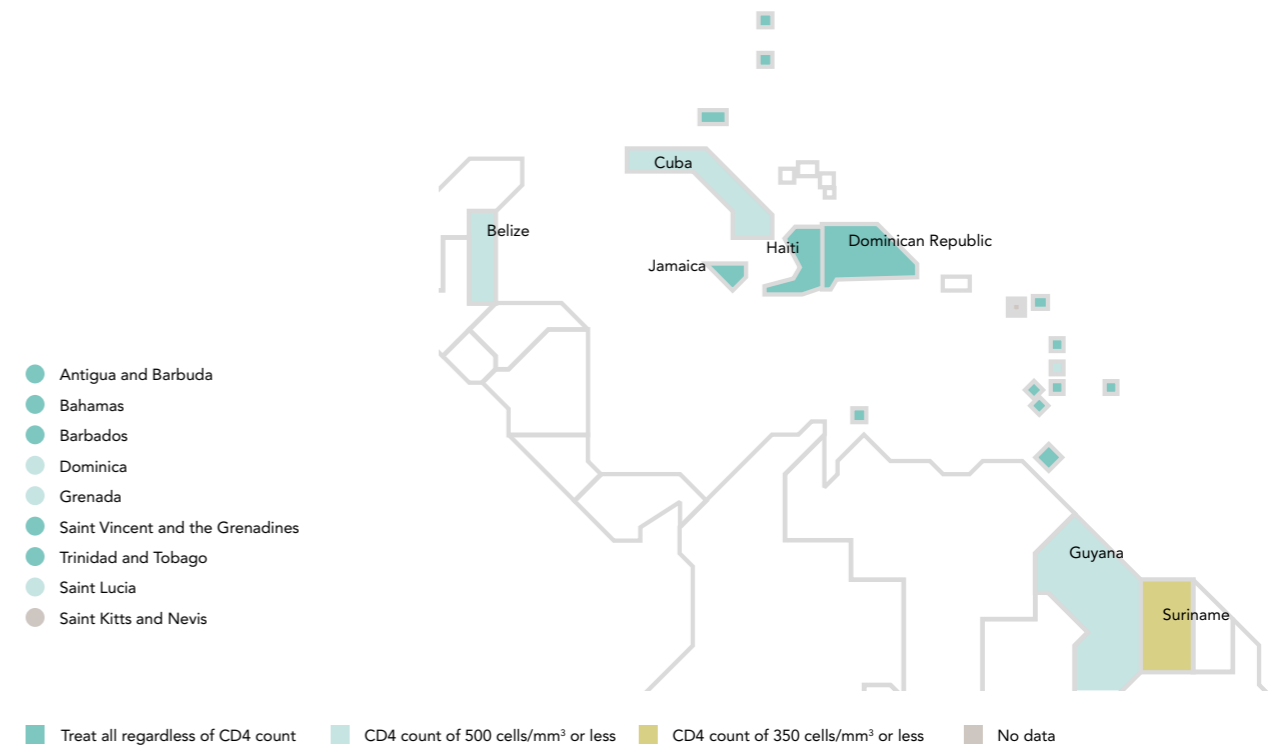


FIGURE 10.2. RECOMMENDED ANTIRETROVIRAL THERAPY INITIATION THRESHOLD AMONG PEOPLE LIVING WITH HIV PER MINISTRY OF HEALTH GUIDELINES, BY COUNTRY, CARIBBEAN, 2016

Eight countries in the Caribbean have adopted the World Health Organization recommendation that antiretroviral therapy should be initiated in every person living with HIV at any CD4 cell count. The majority of the other countries in the region start antiretroviral therapy for individuals who have a CD4 count of under 500 cells/mm<sup>3</sup>. Countries receiving support from the Global Fund to Fight AIDS, Tuberculosis and Malaria (the Global Fund) and the United States President's Emergency Plan for AIDS Relief (PEPFAR) appear to be shifting more quickly to a treat all approach.

Source: World Health Organization, 2017.

## AIDS-RELATED DEATHS DROP BELOW 10 000

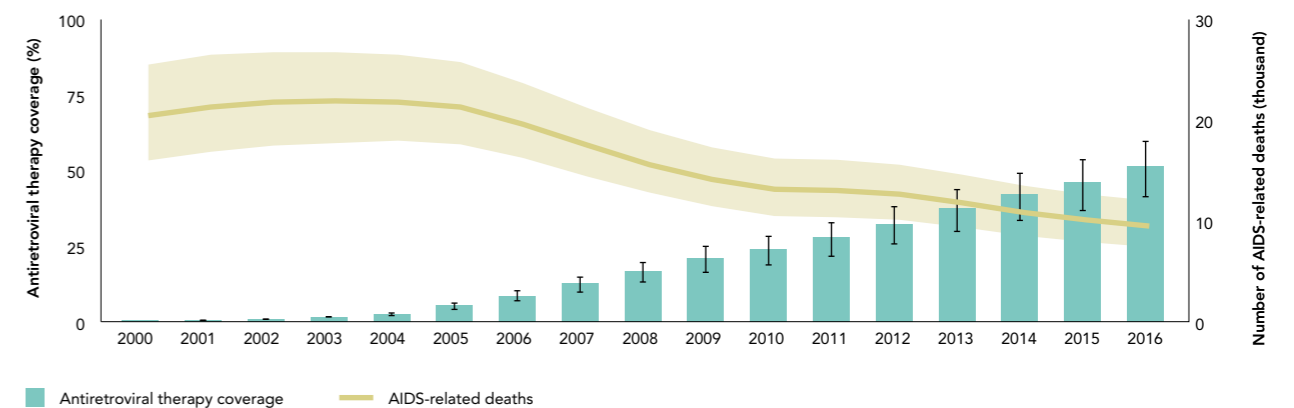


FIGURE 10.3. ANTIRETROVIRAL THERAPY COVERAGE AND NUMBER OF AIDS-RELATED DEATHS, CARIBBEAN, 2000-2016

The number of people accessing antiretroviral therapy over the last six years has more than doubled, and this has played a primary role in the reduction of AIDS-related deaths from an estimated 21 000 [16 000-26 000] in 2000 to an estimated 9 400 [7 300-12 000] in 2016.

Source: 2017 Global AIDS Monitoring. UNAIDS 2017 estimates.

## HIV TESTING AND TREATMENT CASCADE IN THE CARIBBEAN

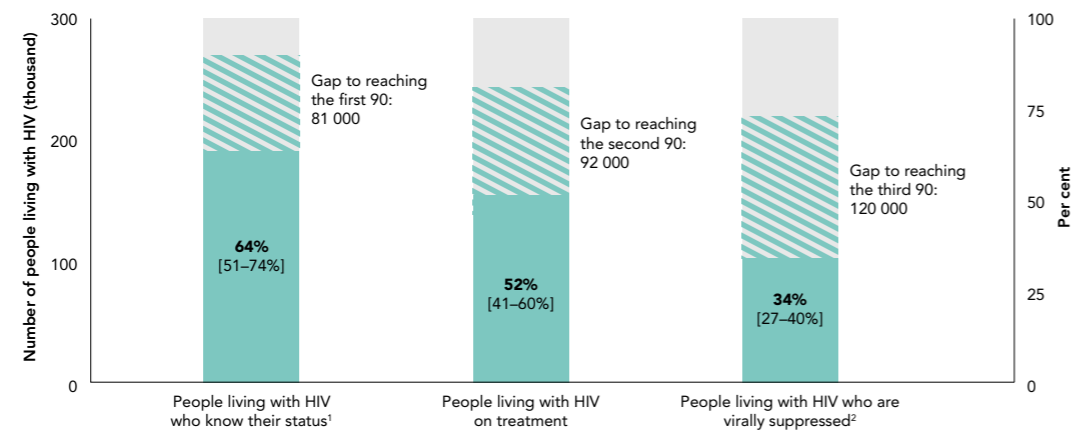


FIGURE 10.4. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, CARIBBEAN, 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

<sup>1</sup> 2016 measure derived from data reported by seven countries, which accounted for 93% of people living with HIV in the region.

<sup>2</sup> 2016 measure derived from data reported by 10 countries. In the region, 52% of all people on antiretroviral therapy were reported to have received a viral load test during the reporting period.

## CLOSING THE GAPS ACROSS THE HIV TESTING AND TREATMENT CASCADE

Nearly two thirds of the 310 000 [280 000–350 000] people living with HIV in the Caribbean at the end of 2016 were aware of their HIV status. Among them, 81% [64–89%] were accessing antiretroviral therapy, and of those who were, 67% [53–77%] were virally suppressed (Figure 10.1). These data translate into treatment coverage of 52% [41–60%] and viral suppression of 34% [27–40%] among all people living with HIV in the region (Figure 10.4).

### Knowledge of HIV status

Knowledge of HIV status among people living with HIV in the Caribbean increased from 58% [46–67%] in 2015 to 64% [51–74%] in 2016 (Figure 10.5). In 2016, the gap to achieving the first 90 of the 90–90–90 targets was 81 000 people living with HIV who did not know their HIV status. Progress towards the first 90 was highest in Cuba (87%) and Jamaica (81%). Jamaica reported that a range of testing options are available in the country, including community outreach elements, focused services for key populations and provider-initiated testing.

### Accessing HIV treatment

The number of people living with HIV on treatment in the Caribbean has more than doubled in six years, from 69 900 [61 500–72 700] in 2010 to 162 000 [143 000–169 000] in 2016. This scale-up translated into an increase in coverage from 24% [18–28%] in 2010 to an estimated 52% [41–60%] in 2016. Sustained increases over the next four years would likely achieve the 2020 target of 81% of all people living with HIV on treatment. In 2016, the gap to achieving the second 90 was starting an additional 92 000 people on HIV treatment.

Treatment coverage was above 60% in Cuba and Trinidad and Tobago, but it lagged in the Bahamas, Belize and Jamaica, where around one in three people living with HIV were accessing treatment. Late diagnosis of HIV infection remains a challenge in several countries. For instance, more than one third of people living with HIV diagnosed in the Bahamas, Barbados and Jamaica in 2016 had a CD4 count of under 200 cells/mm<sup>3</sup>, and in most countries, the proportion of late diagnoses was higher among men than women.

### Achieving viral suppression

Of the 12 countries reporting viral load suppression data to UNAIDS in 2016, about half of people accessing antiretroviral therapy in the Caribbean had access to routine viral load testing. Among people living with HIV who were on treatment, an estimated 67% [53–77%] were virally suppressed. This is equivalent to 34% [27–40%] of all people living with HIV in the region in 2016, an increase from 31% [24–36%] in 2015 (Figure 10.5). In 2016, the gap to reaching the third 90 was the viral suppression of an additional 120 000 people living with HIV in the region.

Several countries in the eastern Caribbean are closing in on the third 90: approximately three of four people on treatment are achieving viral suppression in Barbados, Dominica, Guyana, Suriname and Trinidad and Tobago. In the Dominican Republic and Jamaica, however, viral suppression levels among those accessing treatment were below the regional average.

## GAINS ACROSS THE TREATMENT CASCADE

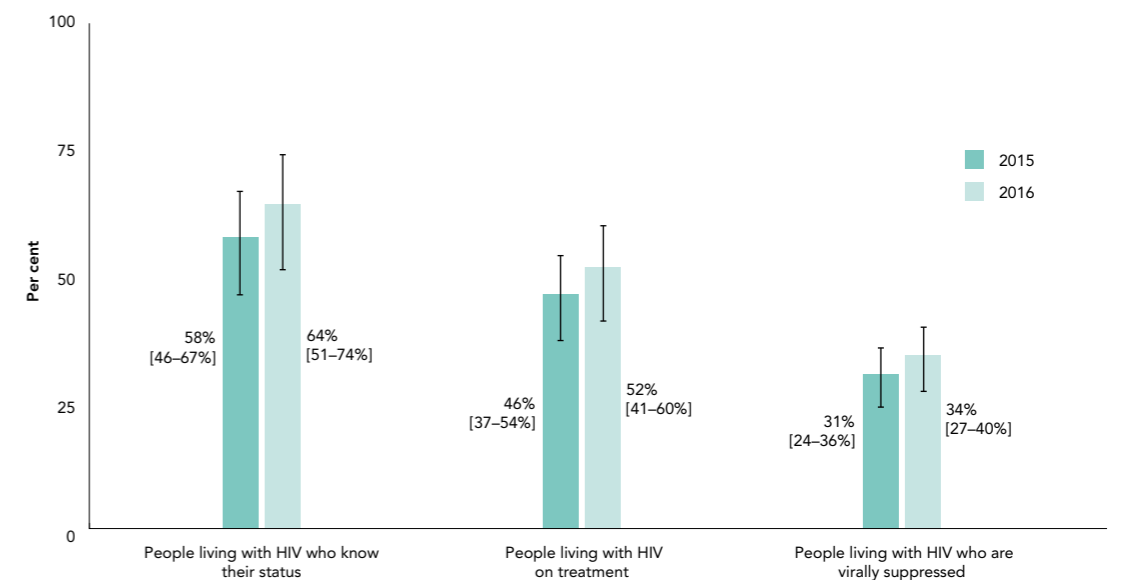


FIGURE 10.5. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, CARIBBEAN, 2015 AND 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.



## NEW HIV INFECTIONS RISING IN CUBA, FALLING IN HAITI

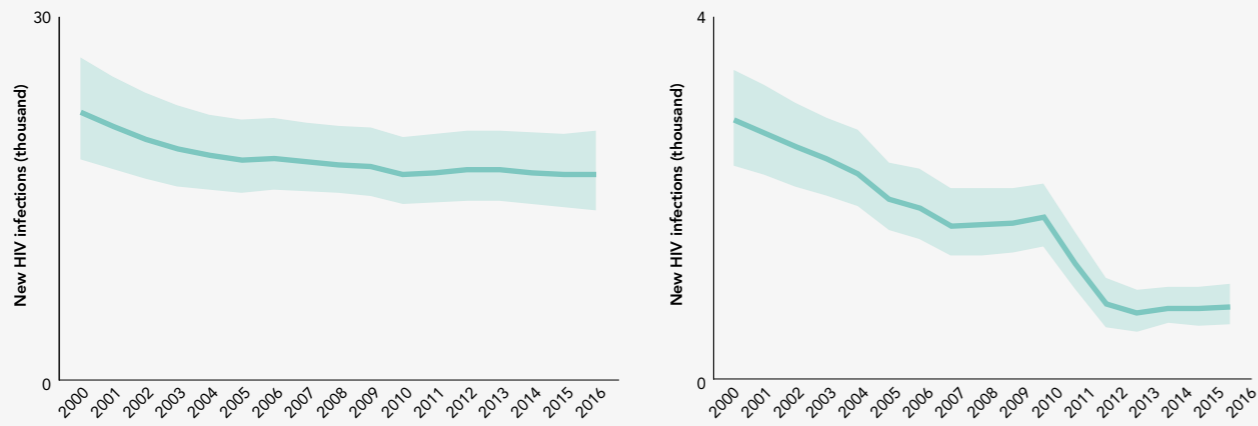


FIGURE 10.6. NUMBER OF NEW HIV INFECTIONS, ADULTS (AGED 15 YEARS AND OLDER), CARIBBEAN, 2000–2016

Source: UNAIDS 2017 estimates.

FIGURE 10.7. NUMBER OF NEW HIV INFECTIONS, CHILDREN (AGED 0–14 YEARS), CARIBBEAN, 2000–2016

Source: UNAIDS 2017 estimates.

The annual number of new infections among adults across the Caribbean has remained static for the last six years at an estimated 17 000 [15 000–22 000 in 2016]. The majority of new infections occurred in Cuba, the Dominican Republic, Haiti and Jamaica. In Cuba, estimated numbers of new HIV infections more than doubled between 2010 and 2016, from 1600 [1400–1800] to 3200 [2600–3600]. In Haiti and Trinidad and Tobago, new infections decreased by nearly a quarter between 2010 and 2016.

New infections among children (aged 0–14 years) in the Caribbean decreased from an estimated 1800 [1500–2200] in 2010 to less than 1000 [<1000–1000] in 2016. The biggest reductions have been in the Dominican Republic and Haiti, where the numbers of new HIV infections among children in each country have declined by nearly 60%.

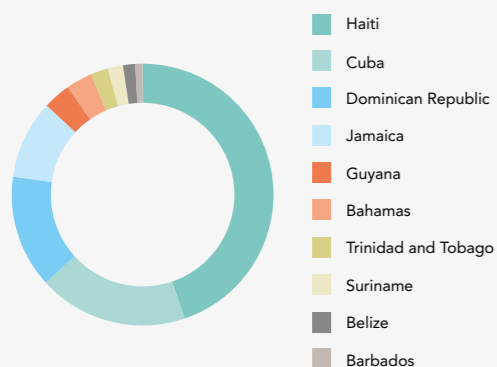


FIGURE 10.8. DISTRIBUTION OF NEW HIV INFECTIONS, BY COUNTRY, CARIBBEAN, 2016

Source: UNAIDS 2017 estimates.

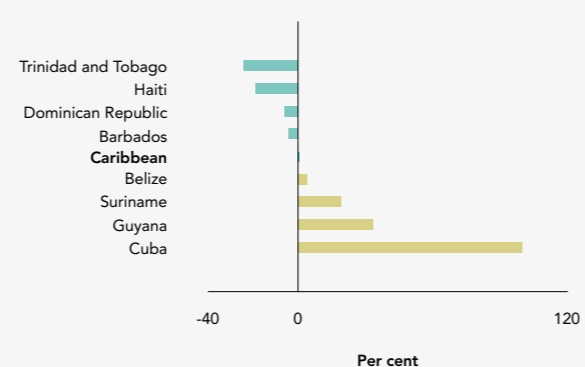


FIGURE 10.9. PERCENT CHANGE IN NEW HIV INFECTIONS, BY COUNTRY, CARIBBEAN, FROM 2010 TO 2016

Source: UNAIDS 2017 estimates.

## INVESTMENT IN THE AIDS RESPONSE

### DIMINISHING EXTERNAL FUNDING IN THE CARIBBEAN



FIGURE 10.10. HIV RESOURCE AVAILABILITY BY SOURCE, 2006–2016, AND PROJECTED RESOURCE NEEDS BY 2020, CARIBBEAN\*

Source: UNAIDS estimates on HIV resource availability, June 2017. Fast-Track update on investments needed in the AIDS response, 2016–2030. Geneva: UNAIDS; 2016. Financing the response to low- and middle-income countries: international assistance from donor governments in 2016. The Henry J. Kaiser Family Foundation and UNAIDS (in press). GAM/GARPR reports (2005–2017). Philanthropic support to address HIV/AIDS in 2015. Washington, DC: Funders Concerned about AIDS; 2016.

\* Estimates for low- and middle-income countries per 2015 World Bank income level classification. All figures are expressed in constant 2016 US dollars.

Resources available for AIDS responses in the region remain considerably lower than what is needed to achieve Fast-Track Targets by 2020 (Figure 10.10). Several Caribbean countries are contending with diminishing external funding for their HIV programmes. While there is wide recognition of the need to increase domestic funding, the fiscal space for doing so is cramped in a region with many small island developing states under considerable economic stress.

Caribbean countries funded 21% of an estimated total of US\$ 367 million allocated to HIV responses in the region in 2016. Donor dependency is higher for prevention with proven impact, in particular for the prevention services focused on key populations such as sex workers, transgender people, people who inject drugs, prisoners and gay men and other men who have sex with men.

Some countries in the region have managed to increase domestic funding. After a drop in donor funding, Guyana has increased its domestic spending on HIV following the signing of a grant agreement with the Global Fund to Fight AIDS, Tuberculosis and Malaria in 2014 that included willingness-to-pay requirements (1). Reducing dependence on external funding across the region will require new resource mobilization approaches, improvements in allocating and tracking HIV resources, and increases in efficiencies and cost savings.

Caribbean countries have explored ways to reduce the costs of HIV treatment, including revising tendering and purchasing processes, diversifying suppliers, using pooled procurement and improving drug quantification and forecasting. An example of this is the Pharmaceutical Procurement Scheme of the Organisation of Eastern Caribbean States, which pools procurement and management of pharmaceuticals and medical supplies to increase the bargaining power of its member states and achieve economies of scale (2). Such strategies give governments the ability to cover larger shares of antiretroviral costs. There also is a strong case for investing more in health system strengthening as the health profile in the Caribbean reflects a high burden of chronic illnesses and the need for greater community involvement in health-care provision (3).

# KINGSTON

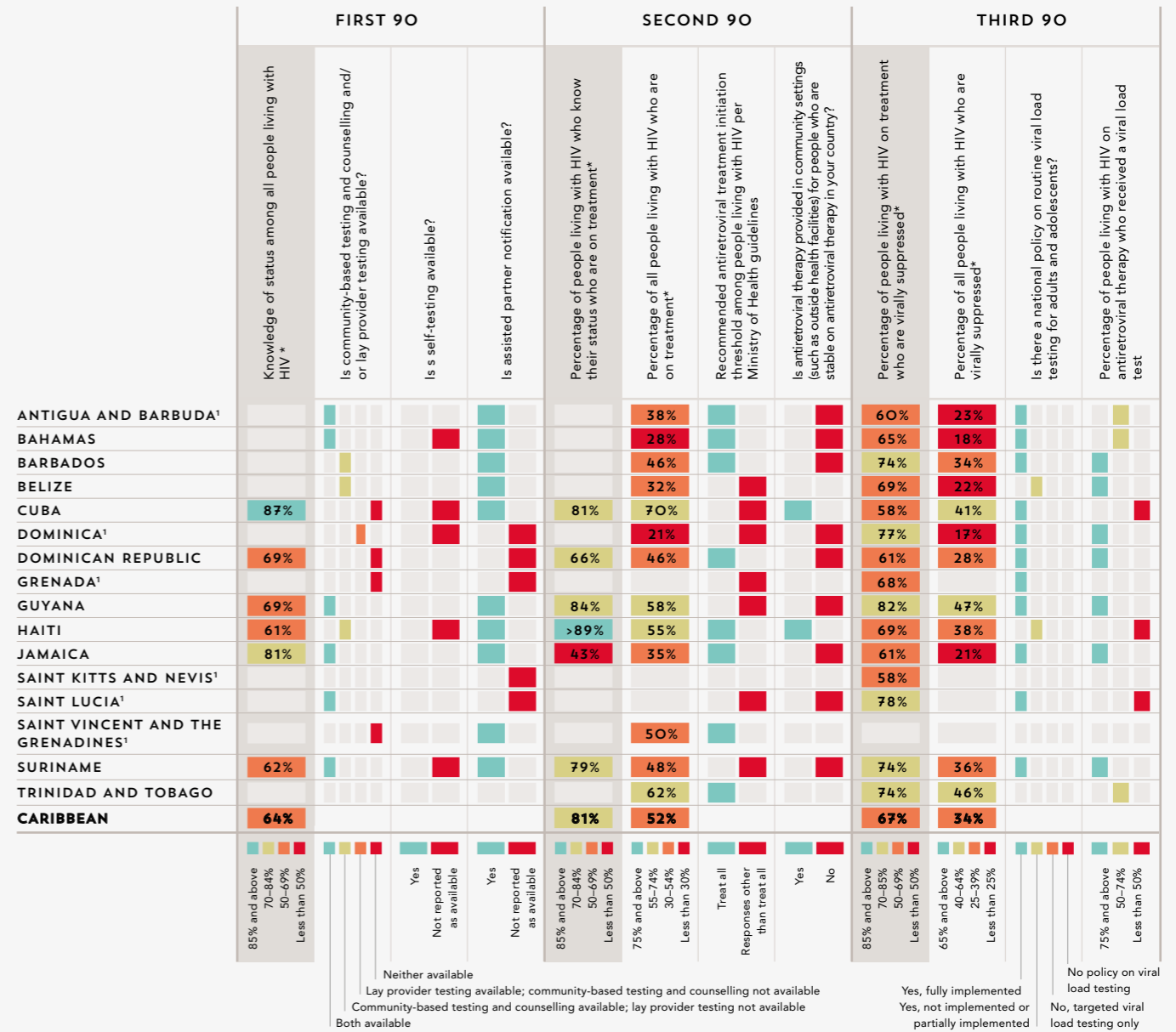
## CITY CASE STUDY

Jamaica is making good progress towards achieving the first 90 of the 90-90-90 targets: 81% of people living with HIV knew their HIV status, reflecting the strength of the country's HIV testing programmes. However, if Jamaica is to achieve the targets, it must reach key populations more effectively with testing, treatment and care services. Community-led initiatives can provide a more discrete and trusted environment. Jamaica AIDS Support for Life (JASL), the country's biggest HIV-focused nongovernmental organization, is playing a key role in reaching key populations in Kingston and Montego Bay with HIV services. JASL's services include outreach

at nightclubs, parties and other gathering places, as well as peer-led life skills sessions and support groups. In 2016, JASL adopted a peer navigation approach to guide individuals along the continuum of care from initial diagnosis to achieving viral suppression. With the majority of JASL members identifying as HIV-positive and lesbian, queer, bisexual, transgender or intersex (LGBTI), they are able to provide the strong social support that is key to this approach.

*The information in this case study was taken from the narrative section of Jamaica's 2017 Global AIDS monitoring report.*

# 90-90-90 COUNTRY SCORECARDS CARIBBEAN



\* The complete set of 90-90-90 measures and testing and treatment cascade data for countries can be found at [aidsinfo.unaids.org](http://aidsinfo.unaids.org).  
Source: UNAIDS special analysis, 2017. 2017 Global AIDS Monitoring. UNAIDS 2017 estimates. 2017 National Commitments and Policy Instrument.  
<sup>1</sup> Estimates of people living with HIV that inform progress towards 90-90-90 are country-supplied and have not been validated by UNAIDS.

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# 11. MIDDLE EAST AND NORTH AFRICA

## PROGRESS TOWARDS THE 90-90-90 TARGETS

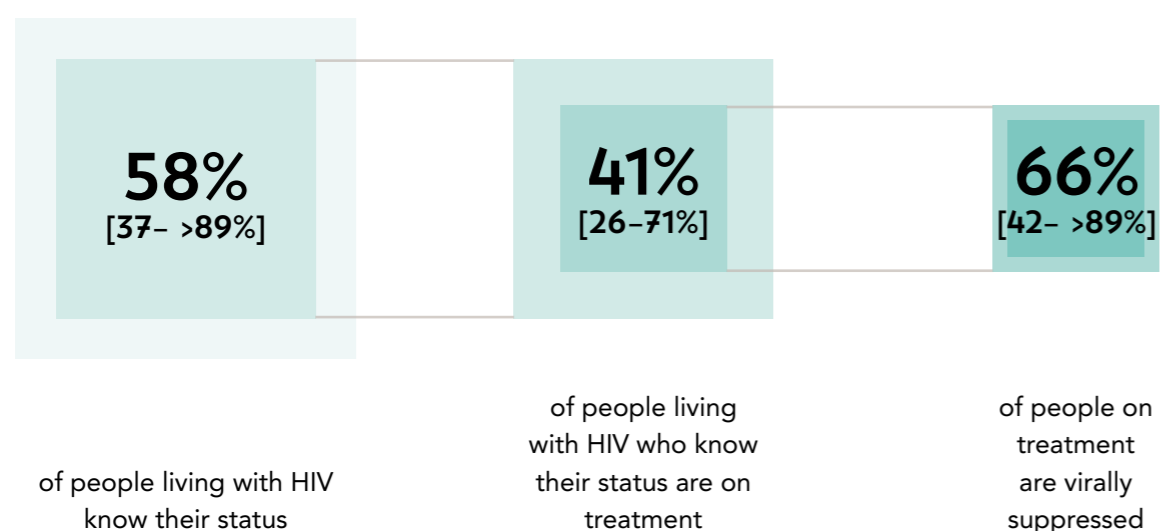


FIGURE 11.1. PROGRESS TOWARDS THE 90-90-90 TARGETS, MIDDLE EAST AND NORTH AFRICA, 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

Community-based testing and treatment programmes are reaching out to key populations in an increasing number of countries in the Middle East and North Africa. However, progress towards 90-90-90 targets in the region is far below the global average. Just over half of people living with HIV in the region know their HIV status. Major gaps along the treatment cascade suggest that linkages between HIV testing and antiretroviral therapy initiation require strengthening, and that treatment adherence is a challenge.

## ADOPTING A TREAT ALL APPROACH

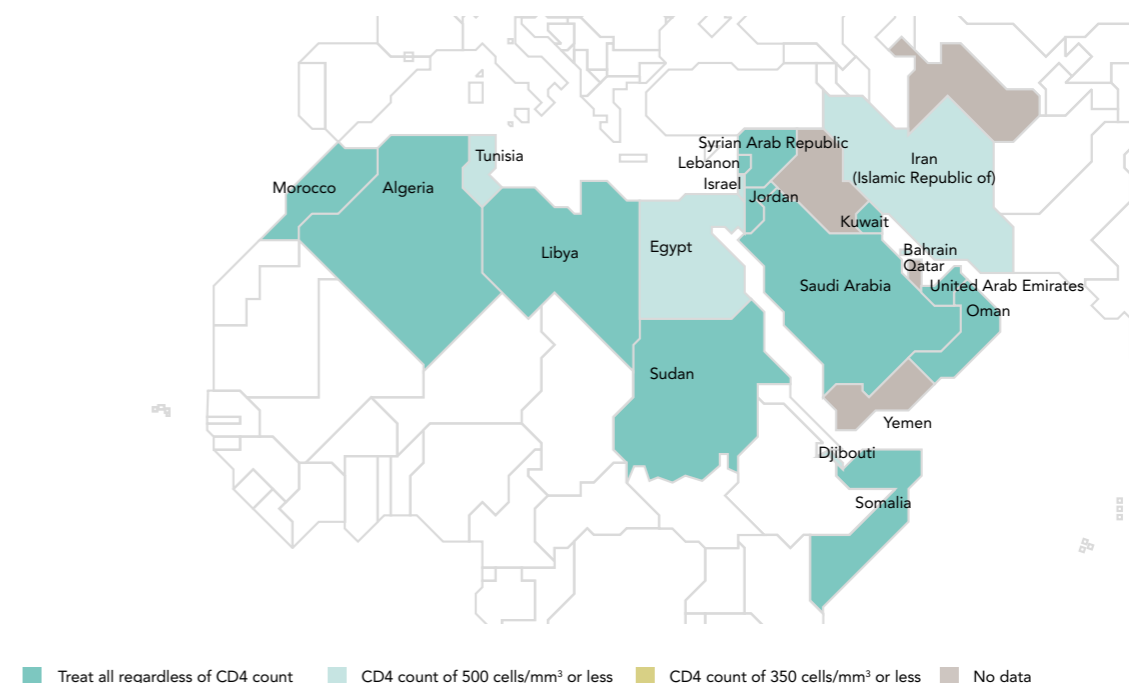


FIGURE 11.2. RECOMMENDED ANTIRETROVIRAL THERAPY INITIATION THRESHOLD AMONG PEOPLE LIVING WITH HIV PER MINISTRY OF HEALTH GUIDELINES, BY COUNTRY, MIDDLE EAST AND NORTH AFRICA, 2016

Algeria, Jordan, Kuwait, Lebanon, Morocco, Oman, Saudi Arabia, Somalia, Syrian Arab Republic and the United Arab Emirates have adopted the World Health Organization recommendation that antiretroviral therapy should be initiated in every person living with HIV at any CD4 cell count. Egypt and the Islamic Republic of Iran are expected to adopt a treat all policy in 2017.

Source: World Health Organization, 2017.

## AIDS-RELATED DEATHS CONTINUE TO RISE

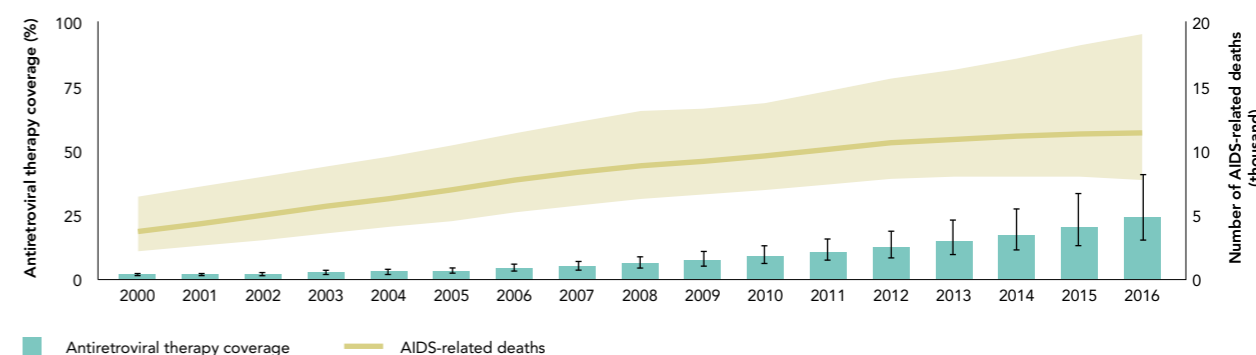


FIGURE 11.3. ANTIRETROVIRAL THERAPY COVERAGE AND NUMBER OF AIDS-RELATED DEATHS, MIDDLE EAST AND NORTH AFRICA, 2000-2016\*

The Middle East and North Africa is one of two regions in the world where AIDS-related deaths continue to rise. The annual number of adults and children dying due to AIDS-related illnesses increased from an estimated 3600 [2200-6400] in 2000 to more than 11 000 [7700-19 000] in 2016. AIDS-related deaths more than doubled between 2000 and 2010 in Egypt, the Islamic Republic of Iran, Kuwait, Morocco, Sudan, Tunisia and Yemen, which can be explained by increasing incidence in some countries and limited access to treatment in others. In countries where treatment coverage has expanded, AIDS-related deaths have decreased significantly since 2010 (e.g. by 37% in Algeria and 28% in Djibouti).

Source: 2017 Global AIDS Monitoring; UNAIDS 2017 estimates.

\* Estimates for Kuwait are for citizens of the country only.

## HIV TESTING AND TREATMENT CASCADE IN THE MIDDLE EAST AND NORTH AFRICA

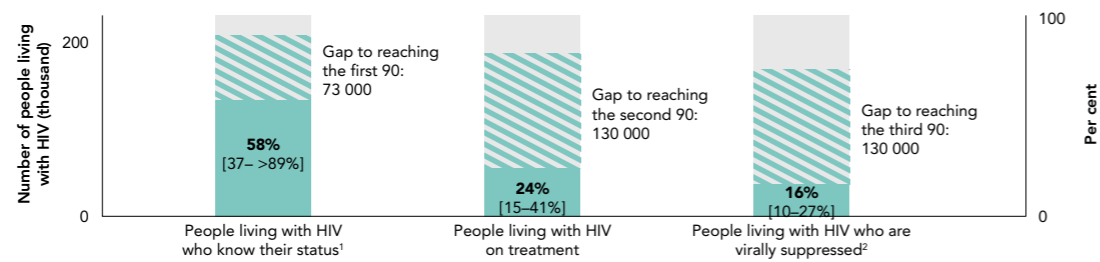


FIGURE 11.4. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, MIDDLE EAST AND NORTH AFRICA, 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

<sup>1</sup> 2016 measure derived from data reported by six countries, which accounted for 80% of people living with HIV in the region.

<sup>2</sup> 2016 measure derived from data reported by six countries. Worldwide, 34% of all people on antiretroviral therapy were reported to have received a viral load test during the reporting period.

## CLOSING THE GAPS ACROSS THE HIV TESTING AND TREATMENT CASCADE

HIV testing and treatment coverage in the Middle East and North Africa is far below the global average. Just over half of the 230 000 [160 000–380 000] people living with HIV in the region at the end of 2016 were aware of their infection. Of those who knew their HIV status, 41% [26–71%] were accessing antiretroviral therapy, which is equivalent to 24% [15–41%] of all people living with HIV in the region. A little over two thirds of people on treatment were virally suppressed, which translates to just 16% [10–27%] of all people living with HIV in the region.

### Knowledge of HIV status

Knowledge of HIV status among people living with HIV in the Middle East and North Africa increased from 48% [30–80%] in 2015 to 58% [37– >89%] in 2016 (Figure 11.5). In 2016, the gap to achieving the first 90 of the 90–90–90 targets was 73 000 people living with HIV who did not know their HIV status.

HIV testing is available mostly through public health facilities and nongovernmental organizations. Given the criminalization of key populations and the stigma and discrimination directed against them in many parts of the region, however, facility-based services struggle to reach greater numbers of people living with HIV. Encouragingly, community-based testing and treatment programmes are operating in an increasing number of countries. Algeria, Djibouti, Egypt, the Islamic Republic of Iran, Morocco and Sudan have been running community testing campaigns for key populations and in locations where HIV risk is high. In Morocco, that approach has seen knowledge of HIV status among people living with HIV rise from 52% to 63%. Similarly, focused HIV testing in Algeria has enabled the country to make important progress towards the first 90: more than 75% of people living with HIV in Algeria were aware of their HIV status in 2016, an increase from 53% in 2015.

### Accessing HIV treatment

Access to antiretroviral therapy has more than doubled over the last six years, from 17 500 [15 400–18 200] in 2010 to 54 400 [47 800–56 500] in 2016. Overall, however, coverage of

treatment is low: the regional average in 2016 was 24% [15–41%] of all people living with HIV. Intensified scale-up is needed to reach the 2020 target of 81% of people living with HIV on treatment. In 2016, the gap to achieving the second 90 was 130 000 additional people on antiretroviral therapy.

Exceptional increases in treatment access were achieved in Algeria, where coverage increased from 24% [22–26%] in 2010 to 76% [68–82%] in 2016, and in Morocco, where coverage increased from 16% [11–21%] to 48% [30–64%] over the same period. Those countries have reviewed and subsequently revised their treatment programmes, opting for more focused and community-based approaches. Scale-up of treatment in Kuwait and Qatar has also advanced such that 80% or more of citizens of these countries who are living with HIV accessed treatment in 2016.

The Islamic Republic of Iran, Somalia and Sudan together accounted for about three quarters of the estimated 170 000 people living with HIV who were not on antiretroviral therapy in 2016. Reaching the 90–90–90 targets in the region depends to large extent on overcoming the gaps in these three countries.

### Achieving viral suppression

Among the seven countries that reported data on viral load suppression in the region, about two thirds of people on antiretroviral therapy had access to routine viral load testing. Viral suppression among all people on treatment in the region was estimated to be 66% [42– >89%], a similar level to what was attained in 2015 (Figure 11.5). In 2016, the gap to reaching the third 90 was the viral suppression of additional 130 000 people living with HIV in the region.

In several countries, the rates of viral suppression among people accessing antiretroviral therapy are alarming, suggesting that treatment adherence is a major issue. In Egypt, for example, only around two in five people on treatment were reported to have suppressed viral loads in 2016.

Countries that are marshalling community-based support and improving case record systems are strengthening retention in care. In Morocco, this approach—combined with decentralizing the prescribing and dispensing of antiretroviral medicines—has increased retention in treatment after 12 months from 75% in 2014 to 95% in 2016.

## GAINS ACROSS THE TREATMENT CASCADE

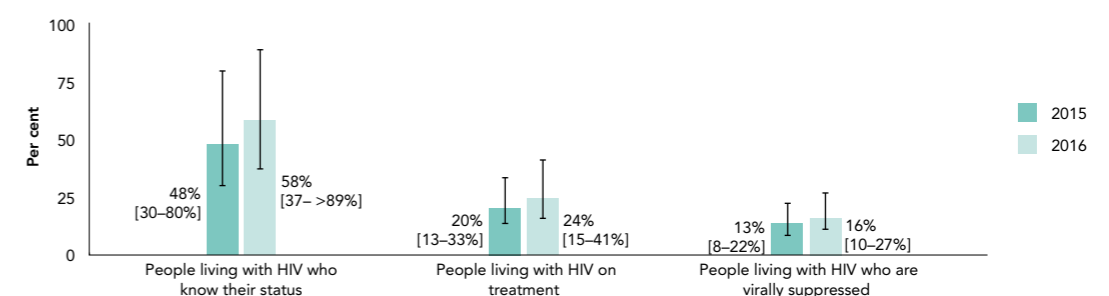


FIGURE 11.5. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, MIDDLE EAST AND NORTH AFRICA, 2015 AND 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

## NEW INFECTION TRENDS VARY WIDELY IN THE MIDDLE EAST AND NORTH AFRICA

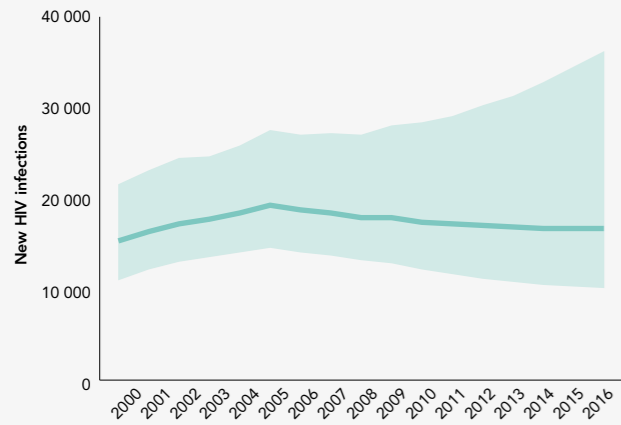


FIGURE 11.6. NUMBER OF NEW HIV INFECTIONS, ADULTS (AGED 15 YEARS AND OLDER), MIDDLE EAST AND NORTH AFRICA, 2000–2016

Source: UNAIDS 2017 estimates.

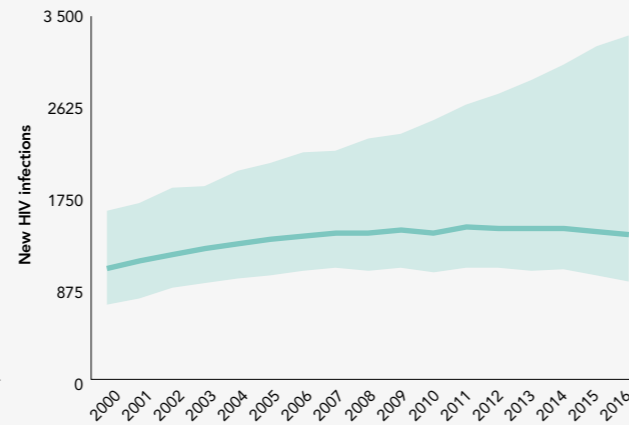


FIGURE 11.7. NUMBER OF NEW HIV INFECTIONS, CHILDREN (AGED 0–14 YEARS), MIDDLE EAST AND NORTH AFRICA, 2000–2016

Source: UNAIDS 2017 estimates.

The annual number of new HIV infections in the Middle East and North Africa has remained stable since 2010, with an estimated 18 000 [11 000–39 000] people newly infected in 2016. Trends among countries in the region, however, have varied widely. Since 2010, there have been substantial decreases in annual new infections in Morocco (42%), the Islamic Republic of Iran (14%) and Somalia (12%). In contrast, new infections rose by 76% in Egypt and 44% in Yemen. Although relatively large increases in new infections occurred between 2010 and 2015 for Jordan, Kuwait and Qatar, the absolute number of new infections remains very small, in part because estimates from these countries are for citizens and exclude temporary migrant workers and other foreign nationals. The Islamic Republic of Iran, Sudan and Somalia accounted for about 65% of new HIV infections in the region in 2016; an additional 23% of new infections occurred in Djibouti, Egypt and Morocco.

There was little change in the number of new HIV infections among children (aged 0–14 years) in the region between 2010 and 2016. Most of the newly infected children were in Somalia and Sudan, which together accounted for approximately two thirds of the total. The biggest reduction in new infections in children between 2010 and 2016 was in Djibouti (44%), where the integration of services to prevent mother-to-child transmission into maternal and child health programmes has been expanded.

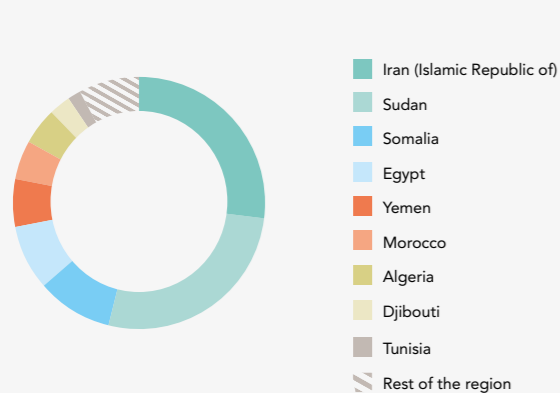


FIGURE 11.8. DISTRIBUTION OF NEW HIV INFECTIONS, BY COUNTRY, MIDDLE EAST AND NORTH AFRICA, 2016

Source: UNAIDS 2017 estimates.

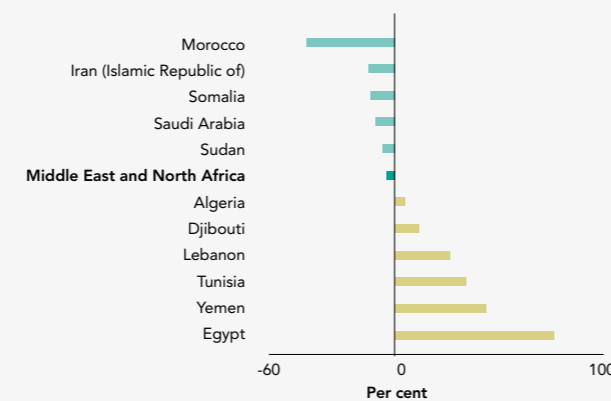


FIGURE 11.9. PERCENT CHANGE IN NEW HIV INFECTIONS, BY COUNTRY, MIDDLE EAST AND NORTH AFRICA, FROM 2010 TO 2016

Source: UNAIDS 2017 estimates.

\*Estimates for Bahrain, Kuwait, Jordan and Qatar are for citizens of the country only.

## INVESTMENT IN THE AIDS RESPONSE

### RESOURCE AVAILABILITY IS SHORT OF FAST-TRACK NEEDS

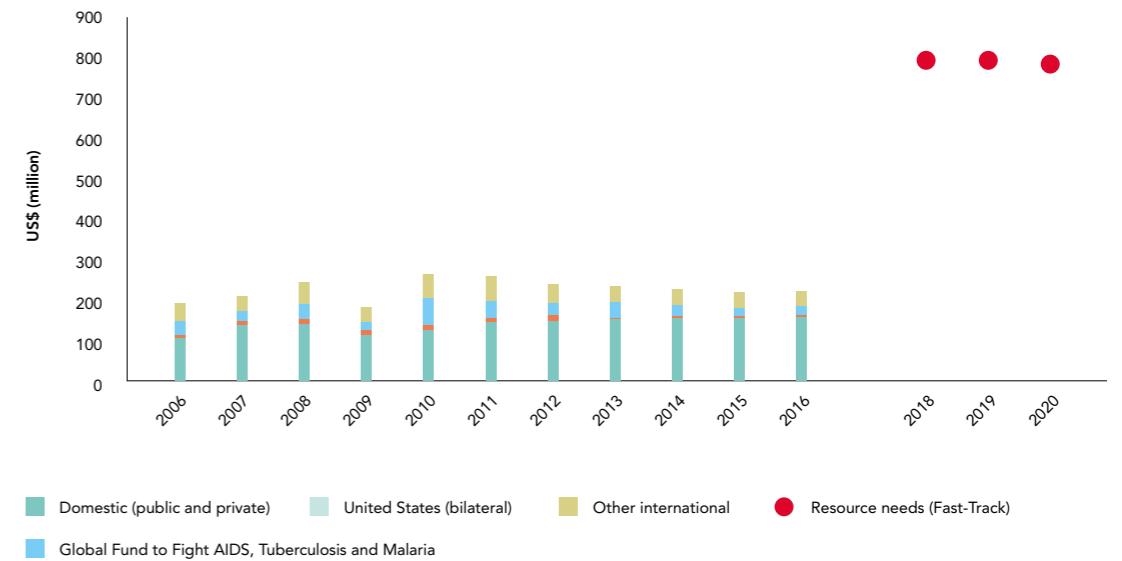


FIGURE 11.10. HIV RESOURCE AVAILABILITY BY SOURCE, 2006–2016, AND PROJECTED RESOURCE NEEDS BY 2020, MIDDLE EAST AND NORTH AFRICA\*

Source: UNAIDS estimates June 2017 on HIV resource availability. Fast-Track update on investments needed in the AIDS response, 2016–2030. Geneva: UNAIDS; 2016. Financing the response to low- and middle-income countries: international assistance from Donor Governments in 2016. The Henry J. Kaiser Family Foundation and UNAIDS (in press). GAM/GARPR reports (2005–2017). Philanthropic support to address HIV/AIDS in 2015. Washington, DC: Funders Concerned about AIDS; 2016.

\*Estimates for low- and middle-income countries per 2015 World Bank income level classification. All figures are expressed in constant 2016 US dollars.

The share of domestic resources for AIDS responses (in constant 2016 US dollars) in the Middle East and North Africa has increased 14% over the last decade, and countries in the region now fund 73% of their AIDS responses. The total level of resource availability, however, is far short of the estimated level of resources needed to achieve both the Fast-Track Targets by 2020 and the end of AIDS as a public health threat by 2030. The current level of resources must nearly triple to around US\$ 750 million by 2020 to reach Fast-Track levels of service coverage. There also is a crucial need to control costs, improve programme effectiveness and achieve efficiency gains through measures such as tailoring services to reach key populations. Furthermore, low-income countries in the region remain highly dependent on donor financing: for example, Djibouti and Somalia are dependent on donor resources for more than 90% of their response. Middle-income countries in the region must explore innovative mechanisms to boost HIV funding.

# TEHRAN

## CITY CASE STUDY

The Islamic Republic of Iran is rolling out a Fast-Track approach in its capital, Tehran. Infection levels in the city among people who inject drugs are very high: one recent survey found HIV prevalence of 27% (1). Most HIV activities therefore have focused on reaching this key population with harm reduction and other prevention services. Services are delivered across a range of outlets in Tehran, including voluntary counselling and treatment centres, women's centres, opioid substitution treatment facilities and night shelters; they also are delivered via outreach teams. More than 100 public sector outlets and 28 outreach teams, the majority of which are linked to local nongovernmental organizations, are providing services to address the basic needs of people at high risk of HIV infection, including shelter, food and health services (2).

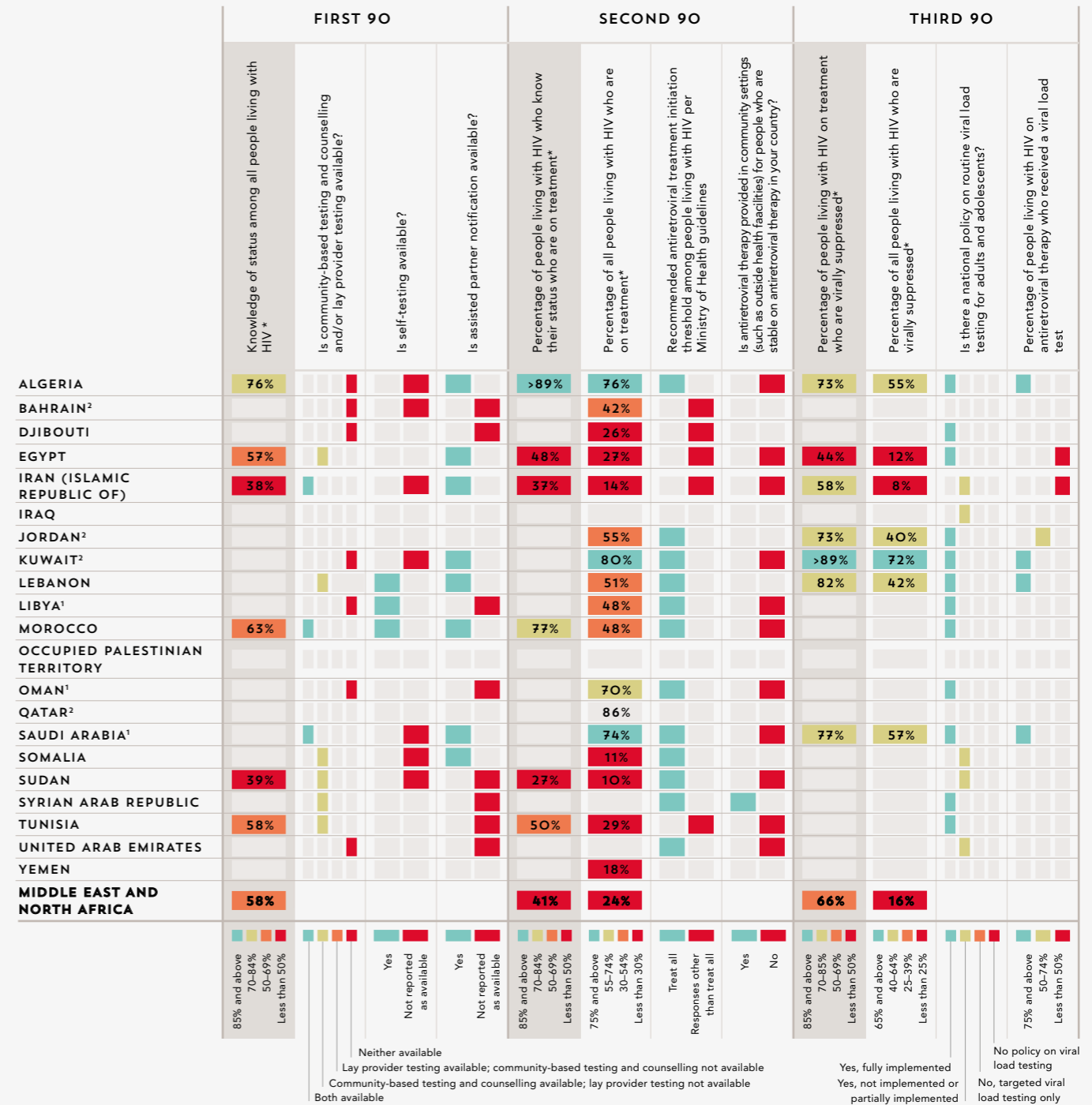
Despite the availability of free antiretroviral medicines, HIV treatment coverage remains under

30%, even though the number of people on antiretroviral therapy increased by 56% between 2014 and 2016. Gaps include poor uptake of HIV testing among populations that are at high risk of infection. In a bid to improve testing and treatment coverage, health authorities in the city launched an AIDS Bus campaign in late 2015, a mobile outreach programme that includes voluntary HIV testing and counselling. Since its launch, more than 1500 people have used the service, and it has recently been expanded to other cities (3).

The Tehran Municipality also launched the Healthy Citizen Campaign in January 2016 to raise public awareness of both communicable and noncommunicable diseases via more than 400 billboards that have been designed by graphic artists. Next steps include conducting detailed mapping of key populations and impact evaluations of the current service approaches.



# 90-90-90 COUNTRY SCORECARDS MIDDLE EAST AND NORTH AFRICA



Source: UNAIDS special analysis, 2017. 2017 Global AIDS Monitoring. UNAIDS 2017 estimates. 2017 National Commitments and Policy Instrument.

\* The complete set of 90-90-90 measures and testing and treatment cascade data for countries can be found at [aidsinfo.unaids.org](http://aidsinfo.unaids.org).

<sup>1</sup> Estimates of people living with HIV that inform progress towards 90-90-90 are country-supplied and have not been validated by UNAIDS.

<sup>2</sup> Estimates of people living with HIV are only for citizens of the country.

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2. Summary of service statistics submitted by Ministry of Health & Medical Education and the Ministry of Labour, Cooperatives & Social Welfare. Tehran Fast-Track profile (updated 2 May 2017).
3. AIDS Bus implementation report. Payam-Avaran Hamyari, Ministry of Health & Medical Education, Ministry of Labour, Cooperatives and Social Welfare and UNAIDS; 2016.



# 12. EASTERN EUROPE AND CENTRAL ASIA

## PROGRESS TOWARDS THE 90-90-90 TARGETS

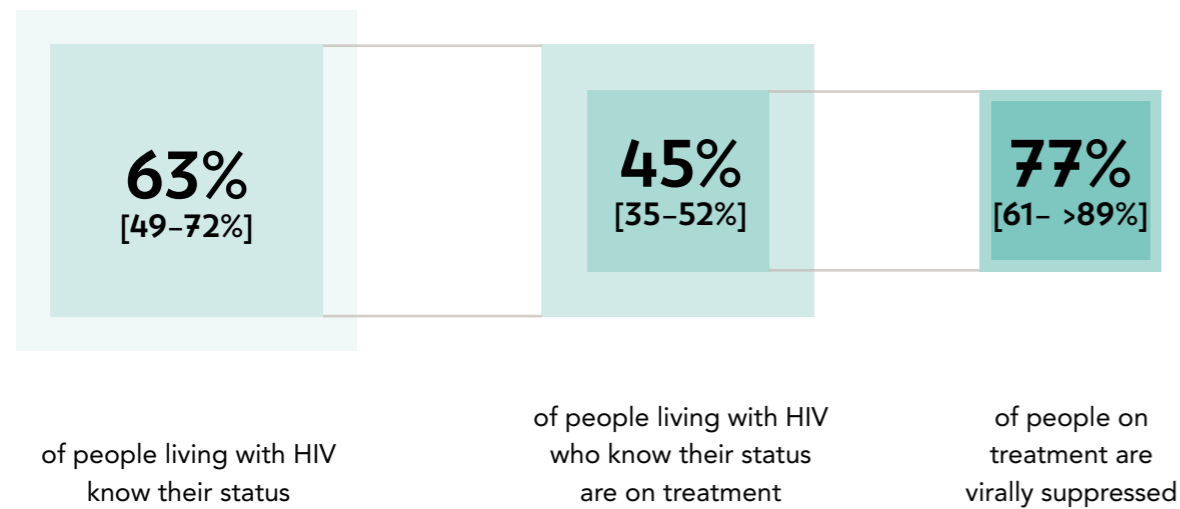


FIGURE 12.1. PROGRESS TOWARDS THE 90-90-90 TARGETS, EASTERN EUROPE AND CENTRAL ASIA, 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

Annual numbers of new HIV infections continue to increase in eastern Europe and central Asia. There are large gaps along the 90-90-90 continuum in the region. As a result, treatment coverage remains alarmingly low, and less than a quarter of people living with HIV had suppressed viral loads in 2016. Increasing domestic investments and greater attention to the provision of services to key populations could accelerate progress towards the targets.

## ADOPTING A TREAT ALL APPROACH

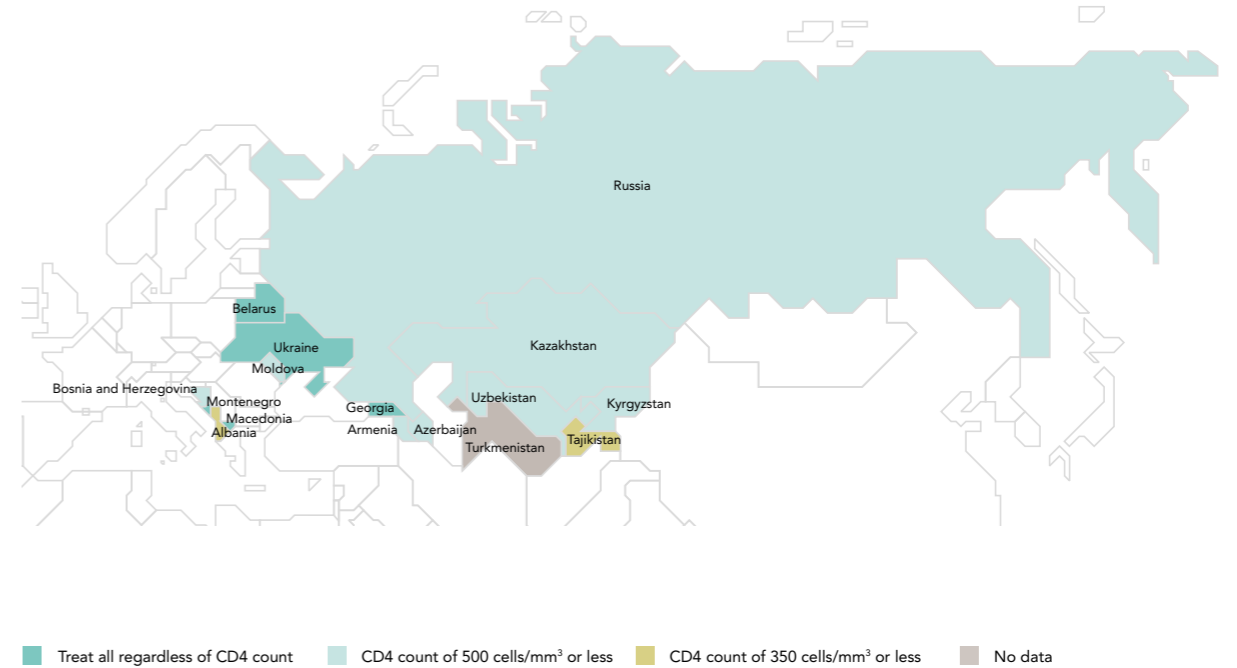


FIGURE 12.2. RECOMMENDED ANTIRETROVIRAL THERAPY INITIATION THRESHOLD AMONG PEOPLE LIVING WITH HIV PER MINISTRY OF HEALTH GUIDELINES, BY COUNTRY, EASTERN EUROPE AND CENTRAL ASIA, 2016

Four countries—Belarus, Georgia, Montenegro and Ukraine—have adopted the World Health Organization recommendation that antiretroviral therapy should be initiated in every person living with HIV at any CD4 cell count.

Source: World Health Organization, 2017.

## AIDS-RELATED DEATHS CONTINUE TO INCREASE

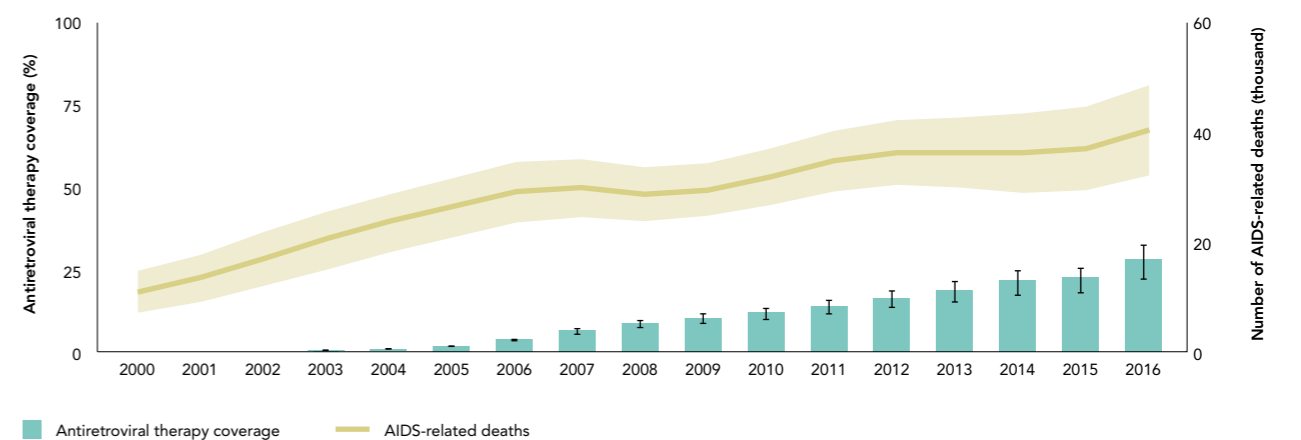


FIGURE 12.3. ANTIRETROVIRAL THERAPY COVERAGE AND NUMBER OF AIDS-RELATED DEATHS, EASTERN EUROPE AND CENTRAL ASIA, 2000-2016

Low coverage of HIV testing and treatment programmes and rising numbers of new infections are contributing to an increasing trend in AIDS-related mortality. The annual number of deaths due to AIDS-related causes rose from an estimated 32 000 [27 000–37 000] in 2010 to 40 000 [32 000–49 000] in 2016, a 25% increase. The bulk of this increase occurred in the Russian Federation, where the epidemic claimed a reported 30 550 lives in 2016 (1).

Source: 2017 Global AIDS Monitoring. UNAIDS 2017 estimates.

## HIV TESTING AND TREATMENT CASCADE IN EASTERN EUROPE AND CENTRAL ASIA

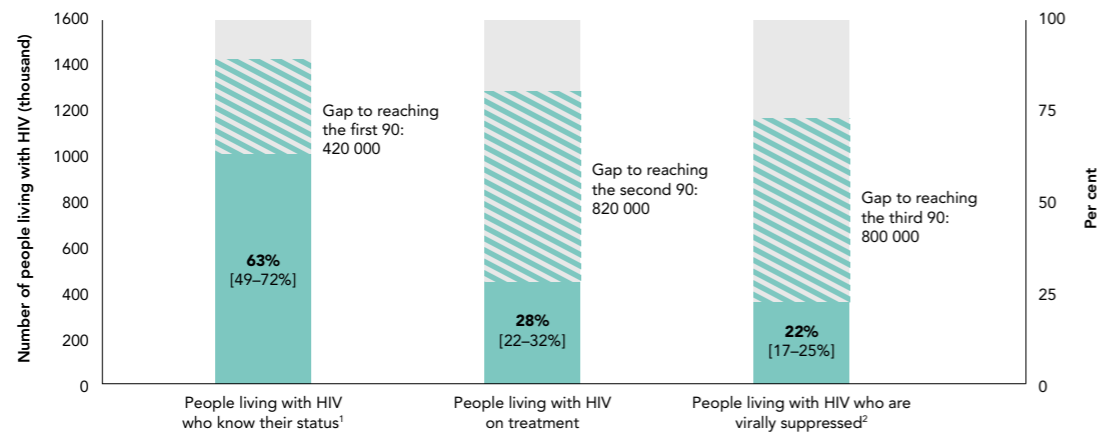


FIGURE 12.4. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, EASTERN EUROPE AND CENTRAL ASIA, 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

<sup>1</sup> 2016 measure derived from data reported by 12 countries, which accounted for 99% of people living with HIV in the region.

<sup>2</sup> 2016 measure derived from data reported by 13 countries. In the region, 93% of all people on antiretroviral therapy were reported to have received a viral load test during the reporting period.

## CLOSING THE GAPS ACROSS THE HIV TESTING AND TREATMENT CASCADE

Nearly two thirds of the 1.6 million [1.4 million–1.7 million] people living with HIV in eastern Europe and central Asia at the end of 2016 were aware of their infection. Of those who knew their HIV status, 45% [35–52%] were accessing antiretroviral therapy, and among those who were, 77% [61–89%] were virally suppressed (Figure 12.1). These data translate to treatment coverage of 28% [22–32%] and viral suppression of 22% [17–25%] among all people living with HIV in the region (Figure 12.4).

### Knowledge of HIV status

Knowledge of HIV status among people living with HIV in eastern Europe and central Asia slightly increased from 59% [46–67%] in 2015 to 63% [49–72%] in 2016 (Figure 12.5). In 2016, the gap to achieving the first 90 was 420 000 people living with HIV who did not know their HIV status.

Studies indicate that HIV testing among people who inject drugs is low in many countries in the region. Testing coverage among people who inject drugs in the last year for which data are available was 12% in Azerbaijan in 2016, 23% in Bosnia and Herzegovina (2015), 26% in Georgia (2015), 62% in Kazakhstan (2016), 43% in Kyrgyzstan (2013), 49% in Ukraine (2015) and 32% in Uzbekistan (2015). Testing coverage among gay men and other men who have sex with men was also low, ranging from 57% in the Ukraine (2015) and 70% in Azerbaijan (2016).

## Accessing HIV treatment

Coverage of antiretroviral therapy among all people living with HIV in the region has increased over the last six years, from 12% [10–13%] in 2010 to 28% [22–32%] in 2016. Overall, however, coverage of treatment is low. Limiting factors include the criminalization of drug possession, high prices of antiretroviral medicines and high unit costs for treatment-related services. A substantial acceleration of efforts would be needed to reach the 2020 target of 81% of all people living with HIV accessing antiretroviral therapy. In 2016, the gap to achieving the second 90 in the region was starting 820 000 additional people on treatment.

## Achieving viral suppression

Among the 11 countries in the region that reported viral load data to UNAIDS in 2016, approximately 93% of people on antiretroviral therapy had access to routine viral load testing. Nearly four of five people on treatment had suppressed viral loads. However, low knowledge of HIV status and treatment coverage means that just 22% [17–25%] of all people living with HIV in the region were virally suppressed, up from 18% [14–21%] in 2015 (Figure 12.5). In 2016, the gap to reaching the third 90 was the viral suppression of an additional 800 000 people living with HIV in the region.

## GAINS ACROSS THE TREATMENT CASCADE

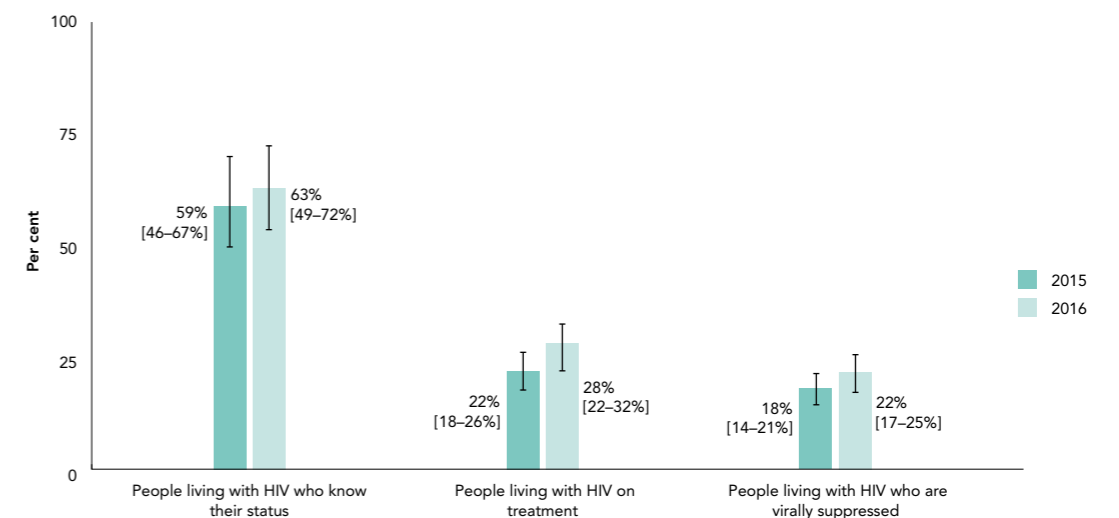


FIGURE 12.5. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, EASTERN EUROPE AND CENTRAL ASIA, 2015 AND 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

## HIV INFECTIONS CONTINUE TO CLIMB IN EASTERN EUROPE AND CENTRAL ASIA

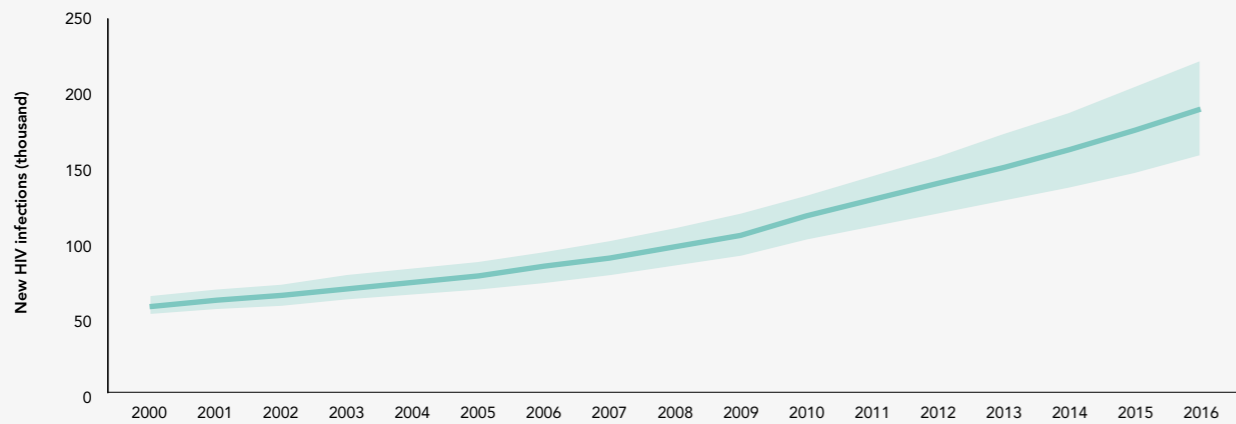


FIGURE 12.6. NUMBER OF NEW HIV INFECTIONS, ADULTS (AGED 15 YEARS AND OLDER), EASTERN EUROPE AND CENTRAL ASIA, 2000–2016

Source: UNAIDS 2017 estimates.

The HIV epidemic in eastern Europe and central Asia continues to grow. The estimated 190 000 [160 000–220 000] people newly infected with HIV in the region in 2016 was a 60% increase over the 120 000 [100 000–130 000] in 2010. People who inject drugs accounted for 42% of new HIV infections in the region in 2015.

The region's HIV epidemic is primarily within two countries: the Russian Federation and Ukraine. These countries accounted for an estimated 81% and 9% of new HIV infections in 2016, respectively. The Russian Federation's epidemic continues to grow rapidly: the number of newly reported cases increased from 62 581 in 2010 to 103 438 in 2016 (1). Several other countries in the region—including Albania and Montenegro—also have rapidly growing epidemics, while Kyrgyzstan and Tajikistan have achieved modest declines in new infections of 5% and 9%, respectively.

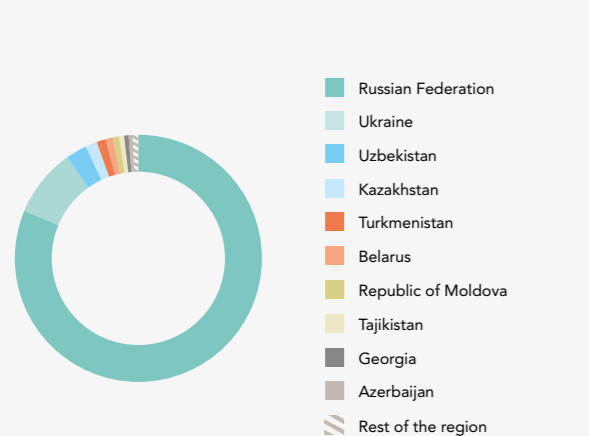


FIGURE 12.7. DISTRIBUTION OF NEW HIV INFECTIONS, BY COUNTRY, EASTERN EUROPE AND CENTRAL ASIA, 2016

Source: UNAIDS 2017 estimates.

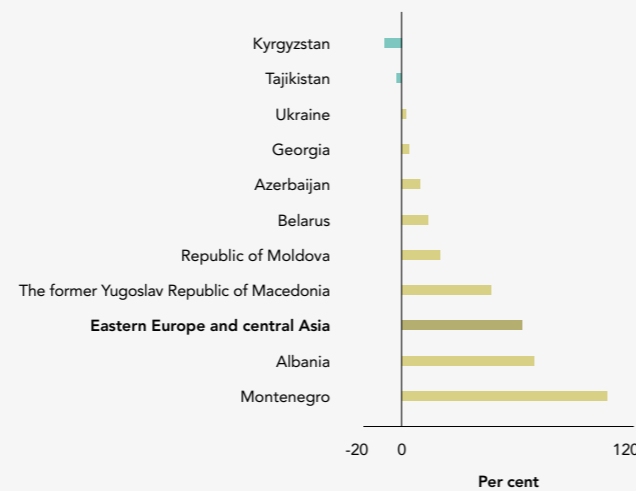


FIGURE 12.8. PERCENT CHANGE IN NEW HIV INFECTIONS, BY COUNTRY, EASTERN EUROPE AND CENTRAL ASIA, FROM 2010 TO 2016

Source: UNAIDS 2017 estimates.

## INVESTMENT IN THE AIDS RESPONSE

### DOMESTIC FUNDING INCREASING, BUT A LARGE RESOURCE GAP REMAINS



FIGURE 12.9. HIV RESOURCE AVAILABILITY BY SOURCE, 2006–2016, AND PROJECTED RESOURCE NEEDS BY 2020, EASTERN EUROPE AND CENTRAL ASIA\*

Source: UNAIDS estimates on HIV resource availability, June 2017. Fast-Track update on investments needed in the AIDS response, 2016–2030. Geneva: UNAIDS; 2016. Financing the response to low- and middle-income countries: international assistance from donor governments in 2016. The Henry J. Kaiser Family Foundation and UNAIDS (in press). GAM/GARPR reports (2005–2017). Philanthropic support to address HIV/AIDS in 2015. Washington, DC: Funders Concerned about AIDS; 2016. \*Estimates for low- and middle-income countries per 2015 World Bank income level classification. All figures are expressed in constant 2016 US dollars.

In 2016, an estimated US\$ 600 million was available for the AIDS response of countries in the region that were considered to be low- and middle-income by the World Bank in 2015.<sup>1</sup> Domestic resources for HIV reached their highest levels to date in 2016, with domestic public sources accounting for about 75% of the total resources in the region. Reaching Fast-Track Targets, however, will require funding to more than double, peaking at roughly US\$ 1.6 billion before slowly decreasing by 16% between 2020 and 2030.

Belarus was one of the first countries in the region to step up domestic spending on HIV in a substantial way, including for increased harm reduction services (2). Kazakhstan also has dramatically increased its domestic HIV funding: its domestic share of HIV treatment funding rose from 7% to 100% between 2007 and 2011 (3).

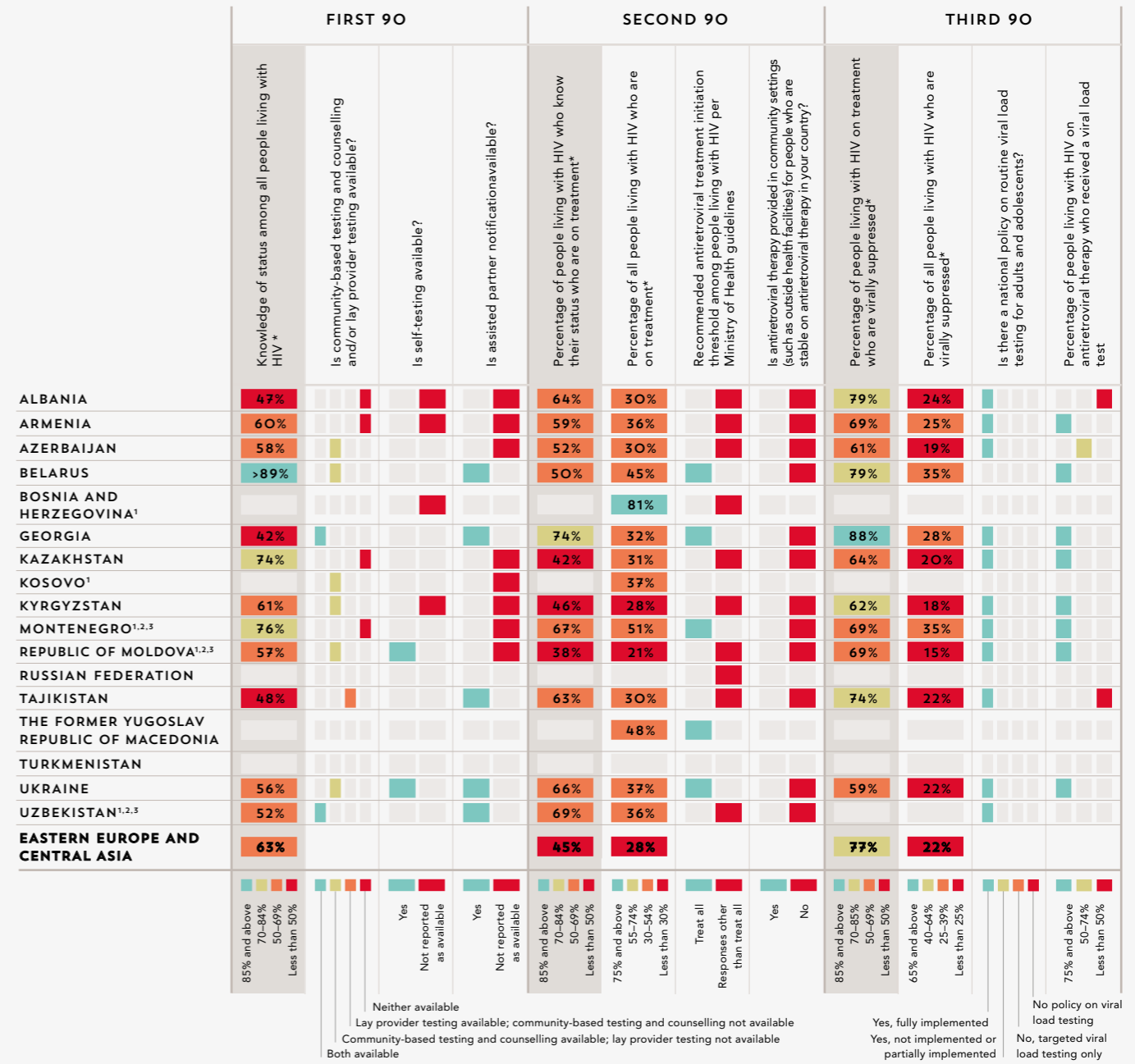
<sup>1</sup> The Russian Federation is notably not among the countries considered to be within this income classification range in 2015.

Ukraine's capital, Kyiv, was the first city in eastern Europe and central Asia to commit formally to ending its AIDS epidemic and to sign the Paris Declaration on Fast-Track Cities Ending the AIDS Epidemic. A detailed Kyiv city profile has been developed, and the city council has developed a Fast-Track launch plan and Fast-Track programme for 2017–2021 that aims to have 82% of people living with HIV accessing antiretroviral therapy. Tracking progress towards local targets is facilitated by a city-specific dashboard that is housed on the Fast-Track Cities global web portal (4).

The Kyiv Fast-Track agenda is funded jointly by the state medical subvention, the municipal budget, the Global Fund to Fight AIDS, Tuberculosis, and Malaria (the Global Fund),

the United States President's Emergency Plan for AIDS Relief (PEPFAR) and the Olena Pincuk Foundation. Public-private partnerships have raised additional donor funding.

City leaders in Kyiv have been engaging other cities to follow its example. In early 2017, the city of Odessa also signed the Paris Declaration and pledged to substantially increase HIV testing and treatment coverage, with a focus on reaching key populations. These city commitments received a major boost in 2017, when a 132% increase in the state budget allocation for antiretroviral therapy and cofinancing by the Global Fund and PEPFAR was announced (5). Streamlined state procurement processes have led to cost reductions for antiretroviral medicines, which should also widen access to treatment.



\* The complete set of 90-90-90 measures and testing and treatment cascade data for countries can be found at [aidsinfo.unaids.org](http://aidsinfo.unaids.org). Source: UNAIDS special analysis, 2017; 2017 Global AIDS Monitoring; UNAIDS 2017 estimates; 2017 National Commitments and Policy Instrument; European Centres for Disease Control and Prevention Continuum of HIV care 2017 progress report.

<sup>1</sup> Estimates of people living with HIV that inform progress towards 90-90-90 are country-supplied and have not been validated by UNAIDS.

<sup>2</sup> All measures of progress toward 90-90-90 and the testing and treatment cascade are for 2015. Policy measures are as of 2016.

<sup>3</sup> Data from European Centres for Disease Control and Prevention Continuum of HIV care 2017 progress report.

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4. Kyiv. In: Fast-Track Cities Global Web Portal [website]. International Association of Providers of AIDS Care; n.d. (<http://www.fast-trackcities.org/cities/kyiv>, accessed 29 June 2017).
5. Odessa signs Paris Declaration on Fast-Track cities. UNAIDS. 17 March 2017 ([http://www.unaids.org/en/resources/presscentre/featurestories/2017/march/20170320\\_odessa](http://www.unaids.org/en/resources/presscentre/featurestories/2017/march/20170320_odessa); accessed 29 June 2017).

# 13. WESTERN AND CENTRAL EUROPE AND NORTH AMERICA

## PROGRESS TOWARDS THE 90-90-90 TARGETS

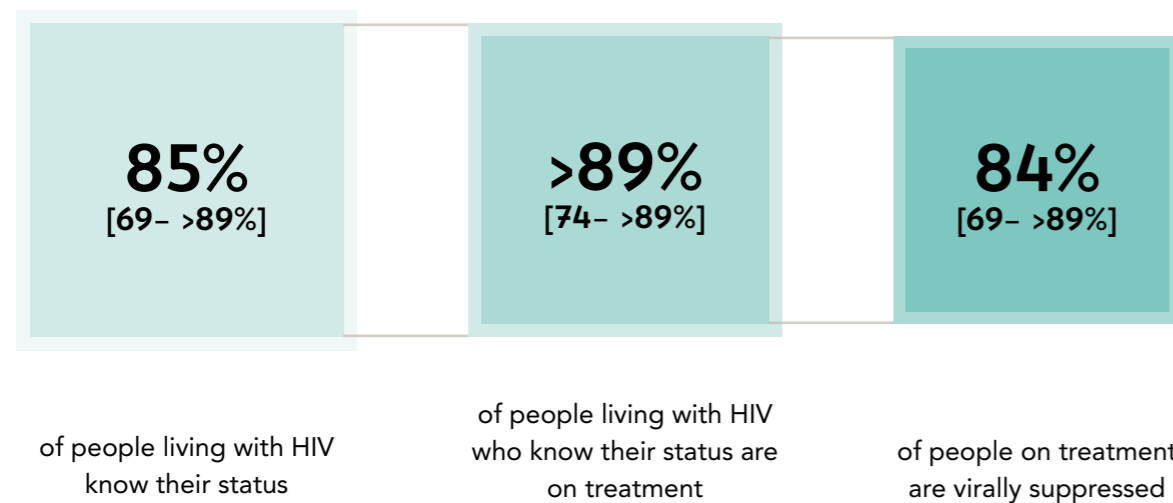


FIGURE 13.1. PROGRESS TOWARDS THE 90-90-90 TARGETS, WESTERN AND CENTRAL EUROPE AND NORTH AMERICA, 2015

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

Several countries in western and central Europe and North America have achieved the 90-90-90 targets, and many more are on the threshold. Among countries that reported data in recent years, 12 of 27 indicated that 85% or more people living with HIV were aware of their HIV status, 13 of 27 indicated that 85% or more people who knew their HIV status were on treatment, and 21 of 25 indicated that 85% or more people on treatment had suppressed viral loads. Late diagnosis of HIV infection remains a challenge: approximately a quarter of people diagnosed with HIV from 2014-2016 had a CD4 T-cell count of less than 200 cells/mm<sup>3</sup>.

## ADOPTING A TREAT ALL APPROACH

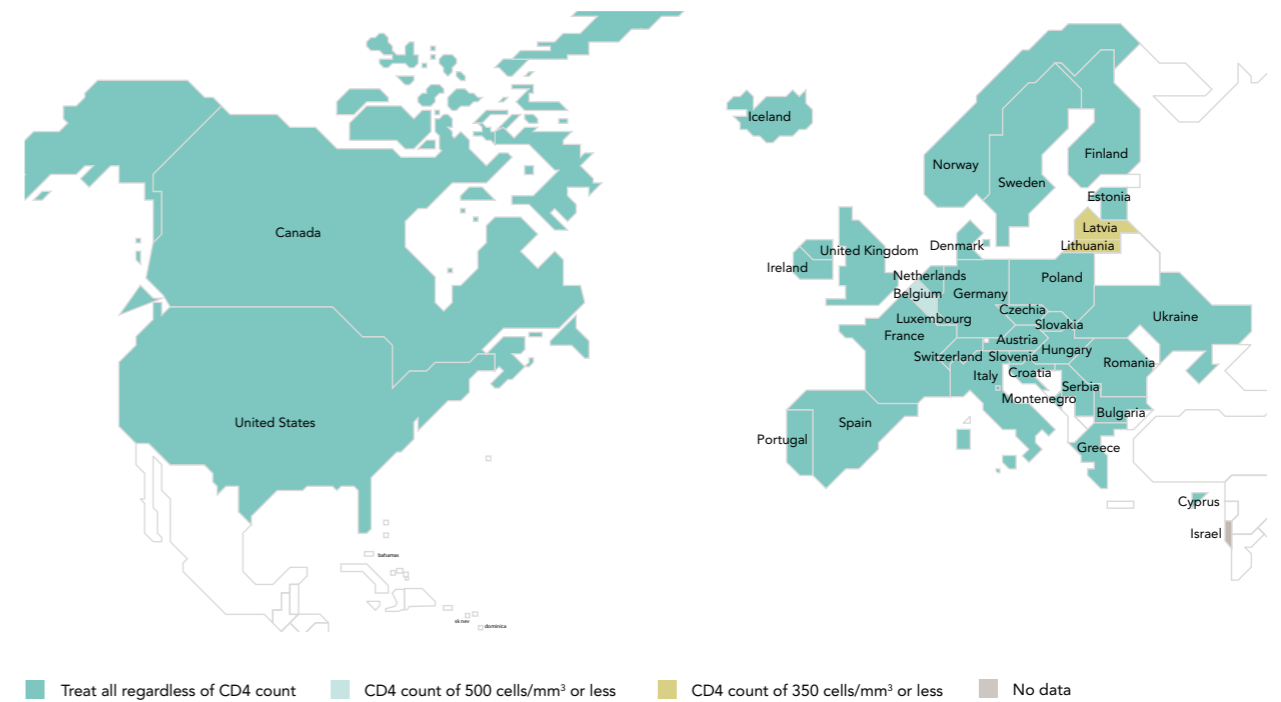


FIGURE 13.2. RECOMMENDED ANTIRETROVIRAL THERAPY INITIATION THRESHOLD AMONG PEOPLE LIVING WITH HIV PER MINISTRY OF HEALTH GUIDELINES, WESTERN AND CENTRAL EUROPE AND NORTH AMERICA, BY COUNTRY, 2016

Most countries in the region have adopted the World Health Organization recommendation that antiretroviral therapy should be initiated in every person living with HIV regardless of CD4 cell count. In Latvia and Lithuania, the threshold for antiretroviral therapy initiation is CD4 T-cell counts of under 350 cells/mm<sup>3</sup>, and in Belgium it is under 500 cells/mm<sup>3</sup>.

Source: World Health Organization, 2017.

## HIGH COVERAGE OF TREATMENT BRINGS AIDS-RELATED MORTALITY UNDER 20 000 A YEAR

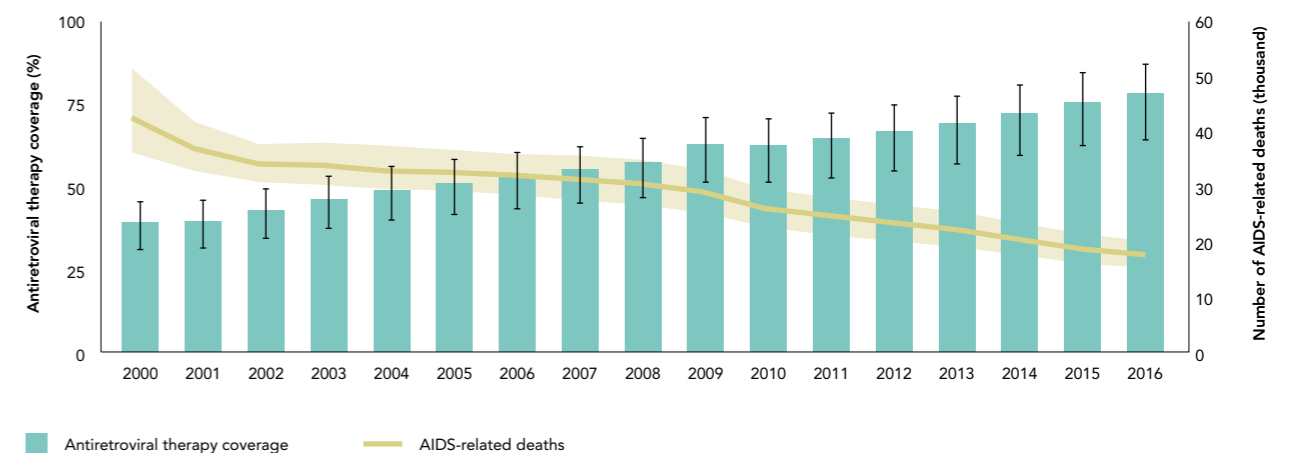


FIGURE 13.3. ANTIRETROVIRAL THERAPY COVERAGE AND NUMBER OF AIDS-RELATED DEATHS, WESTERN AND CENTRAL EUROPE AND NORTH AMERICA, 2000-2016

High and rising coverage of antiretroviral therapy has played a primary role in the reduction of AIDS-related deaths from an estimated 43 000 [36 000-52 000] in 2000 to an estimated 18 000 [15 000-20 000] in 2016.

Source: Global AIDS Monitoring, 2017. UNAIDS 2017 estimates.

## HIV TESTING AND TREATMENT CASCADE IN WESTERN AND CENTRAL EUROPE AND NORTH AMERICA

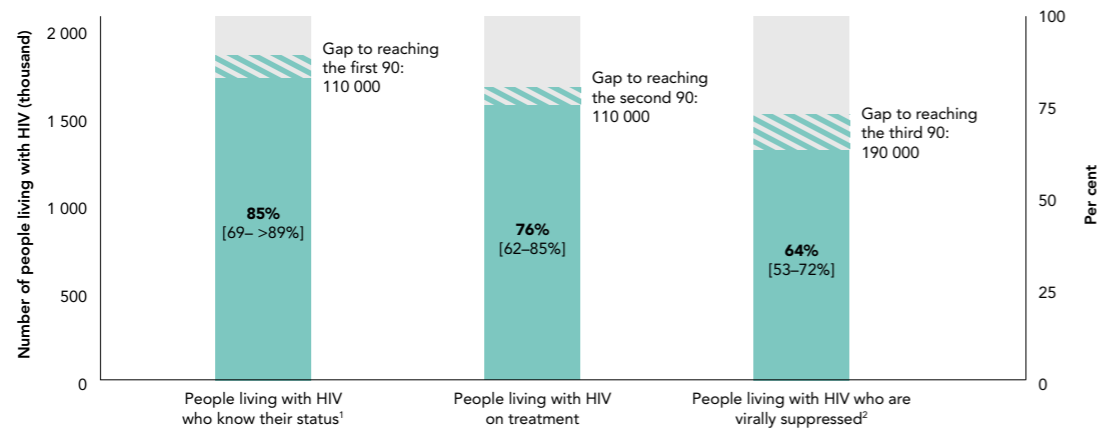


FIGURE 13.4. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, WESTERN AND CENTRAL EUROPE AND NORTH AMERICA, 2015

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

<sup>1</sup> 2016 measure derived from data reported by 25 countries, which accounted for 99% of people living with HIV in western and central Europe and North America.

<sup>2</sup> 2016 measure derived from data reported by 14 countries. Regionally, 100% of all people on antiretroviral therapy were reported to have received a viral load test during the reporting period.

## CLOSING THE GAPS ACROSS THE HIV TESTING AND TREATMENT CASCADE

More than four in five (85% [69–89%]) of the 2.1 million [2.0 million–2.2 million] people living with HIV in western and central Europe and North America at the end of 2015 were aware of their HIV status. Of those who knew their HIV status, >89% [74–89%] were accessing antiretroviral therapy, and among those who were, 84% [69–89%] were virally suppressed (Figure 13.1). These data translate to treatment coverage of 76% [62–85%] and viral suppression of 64% [53–72%] among all people living with HIV in the region in 2015 (Figure 13.4). Insufficient data were available to generate regional estimates for 2016.

### Knowledge of HIV status

According to the most recent data available, two European countries—Denmark and Sweden—had already met the first 90 of the 90–90–90 targets; another 10 countries reported that 85% or more people living with HIV were aware of their HIV status. Similarly, the United States of America has reported that 15% [14–16%] of an estimated 1.1 million people living with HIV in the country in 2014 were undiagnosed (1). In 2015, the gap to achieving the first target across western and central Europe and North America was an additional 110 000 people living with HIV who did not know their HIV status.

Increased knowledge of HIV status can be achieved by increasing the availability of innovative approaches to HIV testing, such as community-based testing and self-testing. In 2016, only three countries in western and central Europe—France, Norway and the United Kingdom of Great Britain and Northern Ireland—had laws and policies in place authorizing self-testing (2). Saliva-based self-testing kits have been available in the United States of America since 2012 (3).

### Accessing HIV treatment

More than three out of four people living with HIV (1 674 000 [1 473 000–1 741 000]) in western and central Europe and North America were accessing antiretroviral therapy in 2016, up from 1 166 000 [1 026 000–1 213 000] in 2010. As the total number of people living with HIV in the region has increased over the last six years, this scale-up has translated into an increase in treatment coverage from 63% [51–71%] of people living with HIV in the region in 2010 to an estimated 78% [64–87%] in 2016. Similar gains over the next four years would likely achieve the target of 81% of all people living with HIV on treatment by 2020. In 2015, the gap to achieving the second 90 was starting an additional 110 000 people on HIV treatment.

According to the latest available data, treatment coverage among people living with HIV was above 81% in Denmark, Iceland, Sweden and the United Kingdom, but just one of four people living with HIV was accessing treatment in Bulgaria, Latvia and Lithuania. In Estonia and Poland, the rate was around one in three.

The United States of America appears to face greater challenges to reaching the second 90 than countries in western Europe. According to the latest national report, an estimated 71% of people living with HIV were receiving medical care in 2014, but only 57% of people living with HIV met the national criteria for continuous HIV medical care (4).<sup>1</sup>

Late diagnosis of HIV infection remains a challenge in several countries. About a quarter of people diagnosed with HIV from 2014–2016 had a CD4 T-cell count of less than 200 cells/mm<sup>3</sup>. The proportion of late diagnosis is particularly high in Romania and Serbia (38% and 37%, respectively).

Antiretroviral medicine costs vary widely in western and central Europe, from more than €20 000 per patient per year in Germany and Switzerland, to €7088 in the United Kingdom and €4190 in Estonia (2).

<sup>1</sup> Retention in continuous HIV medical care is defined by the National HIV/AIDS Strategy for the United States (NHAS 2020) as two or more CD4 or viral load tests performed within three months during the reporting year.

## HIV TESTING AND TREATMENT CASCADE IN THE EUROPEAN UNION

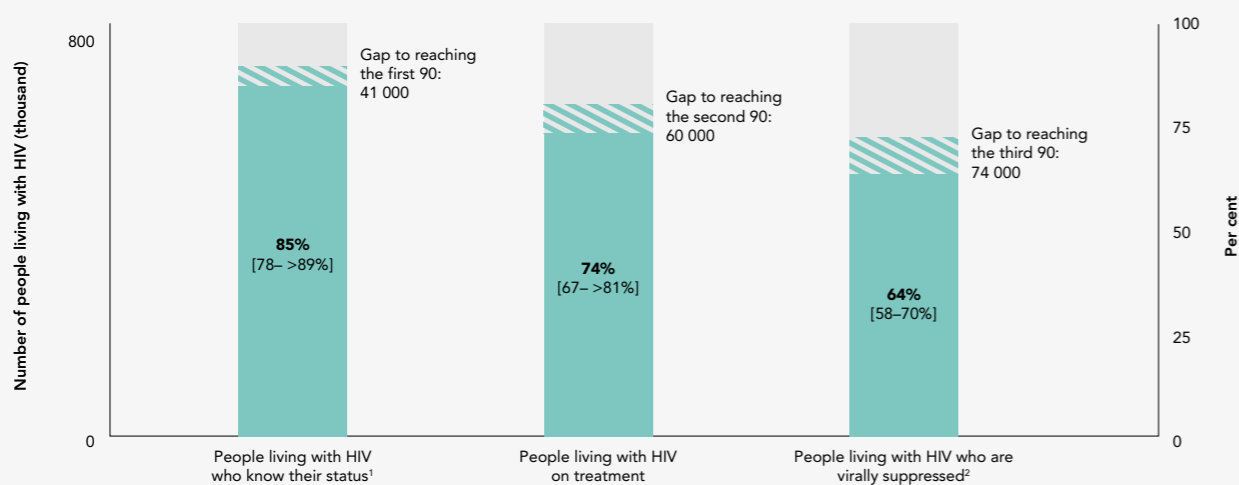


FIGURE 13.5. KNOWLEDGE OF HIV STATUS, ANTIRETROVIRAL THERAPY COVERAGE AND VIRAL SUPPRESSION AMONG PEOPLE LIVING WITH HIV, EUROPEAN UNION, 2016

Source: UNAIDS special analysis, 2017; see annex on methods for more details.

There were 840 000 [770 000–920 000] people living with HIV in the European Union (EU) in 2016. The number of people on antiretroviral therapy in the EU between 2010 and 2016 increased by 46%, from 440 000 [400 000–480 000] to 650 000 [580 000–710 000], an increase in treatment coverage from 60% [54–66%] to 77% [69–84%]. The number of new infections in the EU declined by 6% during the same period, from 31 000 [28 000–34 000] to 29 000 [26 000–31 000]. AIDS-related deaths also decreased by more than a quarter, from 11 400 [8700–14 100] to 8300 [6600–10 400].

### Achieving viral suppression

Most people accessing antiretroviral therapy in western and central Europe and North America had access to routine viral load testing. Among people living with HIV on treatment in 2015, 84% [69–>89%] were virally suppressed, which is equivalent to 64% [52–72%] of all people living with HIV in the region (Figure 13.5). In 2015, the gap to fully achieving the third 90 was the viral suppression of an additional 190 000 people living with HIV in the region.

More than 70% of all people living with HIV were virally suppressed in Denmark, Iceland, Netherlands, Sweden, Switzerland and the United Kingdom. In Bulgaria, Czechia, Greece, Hungary, Lithuania, Poland, Serbia and Slovenia, however, less than half of all people living with HIV had suppressed viral loads. In the United States, viral load was suppressed in 77% of persons who received care in 2013 and in 81% of persons with a viral load test during 2013, which is equivalent to 55% of the total number of people who had been diagnosed with HIV diagnosis by the end of 2012 and were still alive in 2013 (4).

# NEW YORK CITY

## CITY CASE STUDY

New York City has made significant progress in its AIDS response, and it is now close to achieving the 90–90–90 targets. Among the approximately 90 000 people living with HIV in the city in 2015, 94% were aware of their serostatus, 87% of those who knew their status were accessing antiretroviral therapy, and 91% of people on treatment were virally suppressed (8). The 2493 new HIV diagnoses reported in 2015 were the lowest in decades, and for the first time ever, there were no HIV infections through mother-to-child transmission (9).

Building on this success, the city has established a new framework for how HIV-related programming is conceptualized and executed: the HIV Status Neutral Prevention and Treatment Cycle. Unlike traditional care and prevention approaches, the new city-wide strategy does not distinguish between people living with HIV who are in need of treatment and those who are HIV-negative and in need of prevention, a shift that should help to address HIV stigma. Instead, the cycle emphasizes continuous engagement in high-quality, culturally

responsive treatment and preventive services, including antiretroviral therapy, pre-exposure prophylaxis (PrEP) and post-exposure prophylaxis. From a clinical perspective, the HIV Status Neutral does not differentiate between people at risk of HIV who are taking PrEP and people living with HIV who achieve viral suppression.

The city's eight sexual health clinics, which together receive about 90 000 visits a year, are putting the new framework into action (8). Individuals using the clinics are evaluated and offered interventions that fit their personal needs and contexts, along with an HIV test. If a person tests HIV-negative but is at high risk of HIV infection, PrEP is offered. If a person is newly diagnosed with HIV, immediate antiretroviral therapy is offered as part of the city's JumpstART programme. Regardless of the intervention, clients are referred to a social worker, who assists them with the social and financial aspects of care, and to a navigator, who leads them through the process. This allows the emphasis to be placed on getting the right services to the right populations.





## DECLINES IN NEW INFECTIONS IN THE REGION TEMPERED BY INCREASES IN CZECHIA, SERBIA AND SLOVAKIA

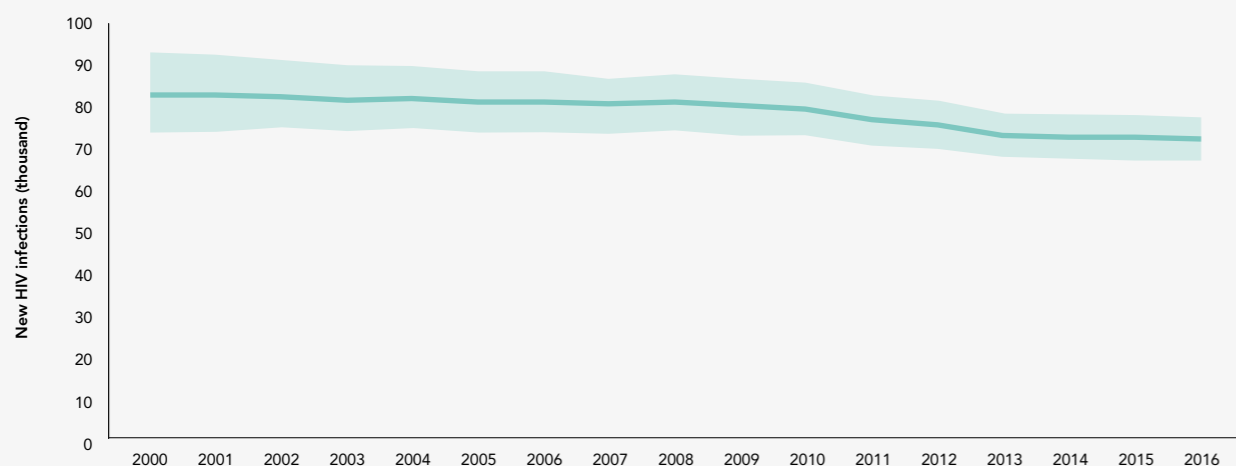


FIGURE 13.6. NUMBER OF NEW HIV INFECTIONS, ADULTS (AGED 15 YEARS AND OLDER), WESTERN AND CENTRAL EUROPE AND NORTH AMERICA, 2000-2016

Source: UNAIDS 2017 estimates.

Western and central Europe and North America contains a variety of HIV epidemics. In the three Baltic countries (Estonia, Latvia and Lithuania), most HIV transmission occurs through injecting drug use and heterosexual intercourse, including sex work (5). In North America and western Europe, HIV transmission mostly occurs during same-sex sexual relations between men. In the United States, gay men and other men who have sex with men accounted for 67% of new HIV infections in 2015, despite making up less than 2% of the general population (6).

The annual number of new infections among adults across western and central Europe and North America has declined by 9% over the last six years, from 79 000 [74 000–86 000] in 2010 to 72 000 [68 000–78 000] in 2016. Half of all new infections in the region in 2016 occurred in the United States.

The number of new infections in the United States declined by 18% in the six-year period between 2008 and 2014 (7). While HIV infections through injecting drug use and heterosexual contact in the United States declined by 56% and 36%, respectively, new infections through male same-sex sexual relations remained stable, albeit with large differences between ethnicities: there was an 18% decline in new HIV infections among white gay men and other men who have sex with men, a stable trend among black gay men and other men who have sex with men, and a 20% increase among Latino gay men and other men who have sex with men (7).

In western and central Europe, the Netherlands experienced a 55% decline in new HIV infections between 2010 and 2016. More gradual declines were achieved in France, Ireland, Italy, Latvia, Lithuania, Romania and Spain. New HIV infections increased by nearly 80% over the same period in Czechia, by more than 70% in Serbia and by more than 60% in Slovakia.

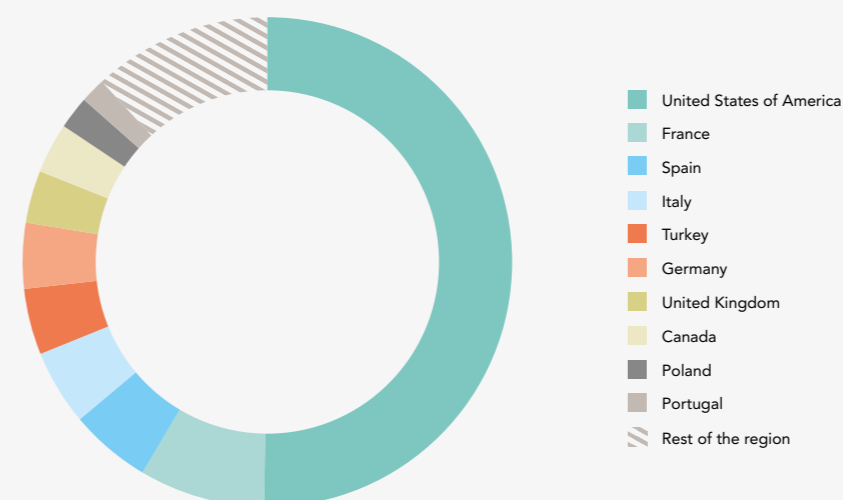


FIGURE 13.7. DISTRIBUTION OF NEW HIV INFECTIONS, BY COUNTRY, WESTERN AND CENTRAL EUROPE AND NORTH AMERICA, 2016

Source: UNAIDS 2017 estimates.

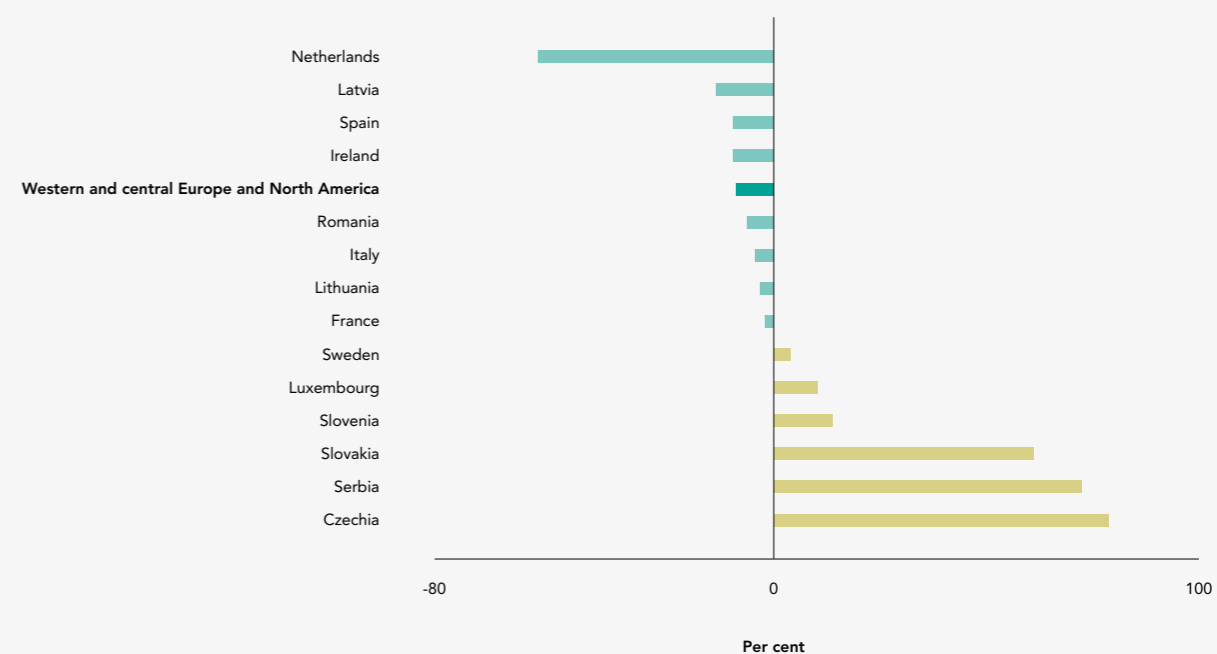


FIGURE 13.8. PERCENT CHANGE IN NEW HIV INFECTIONS, BY COUNTRY, WESTERN AND CENTRAL EUROPE AND NORTH AMERICA, FROM 2010 TO 2016

Source: UNAIDS 2017 estimates.

# 90-90-90 COUNTRY SCORECARDS

## WESTERN AND CENTRAL EUROPE AND NORTH AMERICA

	FIRST 90				SECOND 90				THIRD 90			
	Knowledge of status among all people living with HIV*	Is community-based testing and counselling and/or lay provider testing available?	Is self-testing available?	Is assisted partner notification available?	Percentage of people living with HIV who know their status who are on treatment*	Percentage of all people living with HIV who are on treatment*	Recommended antiretroviral treatment initiation threshold among people living with HIV per Ministry of Health guidelines	Is antiretroviral therapy provided in community settings (such as outside health facilities) for people who are stable on antiretroviral therapy in your country?	Percentage of people living with HIV on treatment who are virally suppressed*	Percentage of all people living with HIV who are virally suppressed*	Is there a national policy on routine viral load testing for adults and adolescents?	Percentage of people living with HIV on antiretroviral therapy who received a viral load test
ANDORRA												
AUSTRIA <sup>1,2,3</sup>	88%				85%	75%			76%	57%		
BELGIUM <sup>1,2,3</sup>	84%				84%	71%			>89%	67%		
BULGARIA <sup>1,2,3</sup>	64%				36%	23%			87%	20%		
CANADA <sup>1,2</sup>	80%				76%	61%			89%	54%		
CROATIA												
CYPRUS												
CZECHIA	75%				69%	52%			>89%	50%		
DENMARK <sup>2,3</sup>	>89%				>89%	>81%			>89%	>73%		
ESTONIA <sup>2,3</sup>	84%				40%	34%						
FINLAND												
FRANCE <sup>1,2,3</sup>	84%				89%	75%			>89%	68%		
GERMANY <sup>1,2,3</sup>	85%				84%	72%			>89%	67%		
GREECE <sup>1,2,3</sup>	78%				67%	53%			73%	39%		
HUNGARY <sup>1,2,3</sup>	87%				53%	46%			>89%	43%		
ICELAND <sup>2</sup>												
IRELAND	85%				>89%	77%			>89%	73%		
ISRAEL <sup>1,2,3</sup>	74%				69%	51%						
ITALY <sup>1,2,3</sup>	88%				88%	78%			87%	67%		
LATVIA												
LIECHTENSTEIN												
LITHUANIA	88%				26%	23%			74%	17%		
LUXEMBOURG <sup>2</sup>	85%				88%	75%			>89%	68%		
MALTA <sup>2,3</sup>	75%				>89%	72%			86%	62%		
MONACO												
NETHERLANDS <sup>1,2,3</sup>	88%				88%	77%			>89%	72%		
NORWAY												
POLAND <sup>2,3</sup>	57%				63%	36%			>89%	32%		
PORTUGAL	76%				>89%	70%			88%	62%		
ROMANIA	89%				77%	68%			>89%	64%		
SAN MARINO												
SERBIA <sup>2,3</sup>	63%				66%	42%			>89%	40%		
SLOVAKIA	79%				74%	59%						
SLOVENIA												
SPAIN <sup>3</sup>	82%				>89%	75%			88%	66%		
SWEDEN <sup>1,2,3</sup>	>89%				>89%	>81%			>89%	>73%		
SWITZERLAND <sup>1,3</sup>	82%				>89%	75%			>89%	72%		
TURKEY												
UNITED KINGDOM <sup>1,2,3</sup>	87%				>89%	>81%			>89%	78%		
UNITED STATES												
<b>WESTERN AND CENTRAL EUROPE AND NORTH AMERICA</b>						<b>78%</b>						

\* The complete set of 90-90-90 measures and testing and treatment cascade data for countries can be found at [aidsinfo.unaids.org](http://aidsinfo.unaids.org).  
<sup>1</sup> All measures of progress toward 90-90-90 and the testing and treatment cascade are for 2016 except as follows: 2015: Bulgaria, Germany, Hungary, Israel, Netherlands, Sweden, Switzerland, United Kingdom. 2014: Belgium, Canada, Serbia, Spain. 2013: Austria, France, Greece. 2012: Italy. Policy measures are as of 2016.  
<sup>2</sup> Estimates of people living with HIV that inform progress towards 90-90-90 are country-supplied and have not been validated by UNAIDS.  
<sup>3</sup> Data from European Centres for Disease Control and Prevention Continuum of HIV care 2017 progress report.  
 Source: UNAIDS special analysis, 2017. 2017 Global AIDS Monitoring. UNAIDS 2017 estimates. 2017 National Commitments and Policy Instrument. European Centres for Disease Prevention and Control. Continuum of HIV care 2017 progress report. Stockholm: European Centres for Disease Prevention and Control; 2017.

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# ANNEX ON METHODS

# PART 1. METHODS FOR DERIVING MODELLED ESTIMATES

## INTRODUCTION

UNAIDS annually provides revised global, regional and country-specific modelled estimates using the best available epidemiological and programmatic data to track the HIV epidemic. Modelled estimates are required because it is impossible to count the exact number of people living with HIV, people who are newly infected with HIV or people who have died from AIDS-related causes in any country: doing so would require regularly testing every person for HIV and investigating all deaths, which is logistically impossible and ethically problematic. Modelled estimates—and the lower and upper bounds around these estimates—provide a scientifically appropriate way of describing HIV epidemic levels and trends.

## PARTNERSHIPS IN DEVELOPING METHODS FOR UNAIDS ESTIMATES

Country teams use UNAIDS-supported software to develop estimates annually. The country teams are primarily comprised of demographers, epidemiologists, monitoring and evaluation specialists and technical partners working under the guidance of the national government's AIDS or health authority.

The software used to produce the estimates is Spectrum, which is developed by Avenir Health, and the Estimates and Projections Package, which is developed by the East–West Center.<sup>1</sup> The UNAIDS Reference Group on Estimates, Modelling and Projections provides technical guidance on the development of the HIV component of the software.<sup>2</sup>

## A BRIEF DESCRIPTION OF METHODS USED BY UNAIDS TO CREATE ESTIMATES

For countries where HIV transmission is high enough to sustain an epidemic in the general population, available epidemiological data typically consist of HIV prevalence results from pregnant women attending antenatal clinics and from nationally representative population-based surveys. Many countries have historically conducted HIV sentinel surveillance among women attending antenatal clinics, which requires collecting data from a selection of clinics for a few months every few years. More recently, a number of countries have stopped conducting sentinel surveillance and are now using the data from the routine HIV tests conducted when pregnant women at antenatal clinics are tested as part of programmes for the prevention of mother-to-child transmission.

These data avoid the need to conduct a separate surveillance effort, and they provide a complete set of data from all clinics instead of samples from specific sites.

The trends from pregnant women at antenatal clinics, whether done through surveillance or routine data, can be used to inform estimates of national prevalence trends, whereas data from population-based surveys—which are conducted less frequently but have broader geographical coverage and also include men—are more useful for informing estimates of national HIV prevalence levels. Data from these surveys also contribute to estimating age- and sex-specific HIV prevalence levels and trends. For a few countries in sub-Saharan Africa that have not conducted population-based surveys, HIV prevalence levels are adjusted based on comparisons of antenatal clinic surveillance and population-based survey data from other countries in the region. HIV prevalence trends and numbers of people on antiretroviral therapy are then used to derive an estimate of HIV incidence trends.

Historically, countries with high HIV transmission have produced separate HIV prevalence and incidence trends for rural and urban areas when there are well-established geographical differences in prevalence. To better describe and account for further geographical heterogeneity, an increasing number of countries have produced subnational estimates (e.g. at the level of the province or state) that, in some cases, also account for rural and urban differences. These subnational or rural–urban estimates and trends are then aggregated to obtain national estimates.

In the remaining countries, where HIV transmission occurs largely among key populations at higher risk of HIV and the epidemic can be described as low-level, the estimates are derived from either surveillance among key populations and the general, low-risk population, or from HIV case reporting data, depending on which data are most reliable in a particular country. In countries with high-quality HIV surveillance data among the key populations, the data from repeated HIV prevalence studies that are focused on key populations are used to derive national estimates and trends. Estimates of the size of key populations are increasingly derived empirically in each country; when studies are not available, they are derived based on regional values and consensus among experts. Other data sources—including HIV case reporting data, population-based surveys and surveillance among pregnant women—are used to estimate the HIV prevalence in the general, low-risk population. The HIV prevalence curves and numbers of people on antiretroviral therapy are then used to derive national HIV incidence trends.

For many countries in western and central Europe and North America, Latin America, the Caribbean and the Middle East and North Africa that have insufficient HIV surveillance or survey data—but which have robust disease reporting systems—HIV case reporting and AIDS-related mortality data are used directly to inform trends and levels in national HIV prevalence and incidence. These methods also allow countries to take into account evidence of underreporting or reporting delays in HIV case report data, as well as the misclassification of deaths from AIDS-related causes.

In all countries where UNAIDS supports the development of estimates, assumptions about the effectiveness of HIV programme scale-up and patterns of HIV transmission and disease progression are used to obtain age- and sex-specific estimates of people living with HIV, people newly infected with HIV, people dying from AIDS-related illnesses, and other important indicators (including treatment programme coverage statistics).

<sup>1</sup> More information on Avenir Health can be found at [www.avenirhealth.org](http://www.avenirhealth.org). The East–West Center website can be found at [www.eastwestcenter.org](http://www.eastwestcenter.org).

<sup>2</sup> For more on the UNAIDS Reference Group on Estimates, Modelling and Projections, please visit [www.epidem.org](http://www.epidem.org).

These assumptions are based on systematic literature reviews and analyses of raw study data by scientific experts. Demographic population data, including fertility estimates, are derived from the United Nations Population Division's World Population Prospects 2015 data files.

Selected inputs into the model—including the number of people on antiretroviral therapy and the number of women accessing services for the prevention of mother-to-child transmission of HIV by type of regimen—are reviewed and validated in partnership with the United Nations Children's Fund (UNICEF), the World Health Organization (WHO) and other partners.

Final country-submitted files containing the modelled outputs are reviewed at UNAIDS to ensure that the results are comparable across regions and countries and over time.

### UNCERTAINTY BOUNDS AROUND UNAIDS ESTIMATES

The estimation software calculates uncertainty bounds around each estimate. These bounds define the range within which the true value lies (if it can be measured). Narrow bounds indicate that an estimate is precise, while wide bounds indicate greater uncertainty regarding the estimate.

In countries using HIV surveillance data, the quantity and source of the data available partly determine the precision of the estimates: countries with more HIV surveillance data have smaller ranges than countries with less surveillance data or smaller sample sizes. Countries in which a national population-based survey has been conducted generally have smaller ranges around estimates than countries where such surveys have not been conducted. Countries producing subnational estimates at the provincial level have wider ranges. In countries using HIV case reporting and AIDS-related mortality data, the number of years of data and the magnitude of the cases reported or AIDS-related deaths observed will contribute to determining the precision of the estimate.

The assumptions required to arrive at the estimate also contribute to the extent of the ranges around the estimates: in brief, the more assumptions, the wider the uncertainty range, since each assumption introduces additional uncertainties. For example, the ranges around the estimates of adult HIV prevalence are smaller than those around the estimates of HIV incidence among children, which require additional data on prevalence among pregnant women and the probability of mother-to-child HIV transmission with their own additional uncertainty.

UNAIDS is confident that the actual numbers of people living with HIV, people who are newly infected with HIV or people who have died from AIDS-related causes lie within the reported ranges. Over time, more and better data from countries will steadily reduce uncertainty.

### IMPROVEMENTS TO THE 2017 UNAIDS ESTIMATES MODEL

Country teams create new Spectrum files every year. The files may differ from one year to the next for two reasons. First, new surveillance and programme data are entered into the model; this can change HIV prevalence and incidence trends over time, including for past years. Second, improvements are incorporated into the model based on the latest available science and statistical methods that lead to the creation of more accurate trends in HIV incidence. Due to these improvements to the model and the addition of new data to create the estimates, the results from previous years cannot be compared with the results from this year. A full historical set of estimates are created each year, however, enabling a description of trends over time.

Between the previous estimates and the 2017 estimates, the following changes were applied to the model under the guidance of the UNAIDS Reference Group on Estimates, Modelling and Projections and based on the latest scientific evidence.

- The ability to add routine data from women attending antenatal clinics for the same sites as the HIV sentinel surveillance was included in the model. In addition, countries can now enter the percentage of all pregnant women found to be HIV-positive using routine data for the entire country.
- Child estimates were modified to improve the calculations of transmission to children among mothers who seroconvert during breastfeeding.
- The distribution of children starting on antiretroviral therapy by age was improved with additional data for young children provided by the International AIDS Society's Collaborative Initiative for Paediatric HIV Education and Research.
- The model was improved to allow the inclusion of incidence measures either from a cross-sectional survey or a cohort study.
- Age- and sex-specific prevalence data from household surveys are now used to inform the distribution of incidence across the age bands and by sex.
- A critical assumption for estimating children living with HIV includes accurately describing fertility among women living with HIV. The new model now reduces fertility among women with low CD4 levels.
- Additional variance was added to the model to account for the non-sampling error in prevalence from antenatal care attendees.
- Modifications were made to the model to expand eligibility of antiretroviral therapy to people with a CD4 cell count below 250 cells/mm<sup>3</sup> when the national treatment guidelines applied a threshold of a CD4 cell count below 200 cells/mm<sup>3</sup>. This allows for an additional group of people with stage 3 or 4 disease to be considered eligible for treatment per previous WHO recommendations.

- A limit on the number of people reported by the country to be accessing antiretroviral treatment equal to those estimated to be in need by the model (informed by the CD4 count threshold in the national treatment guidelines) has been removed. Removal of this limit allows all people that countries report to be accessing treatment to be included in the model.
- For countries using new case diagnoses to derive HIV incidence, improved assumptions were incorporated about the number of people who died without an HIV diagnosis that are based on existing patterns of survival in the model for those not on treatment.
- An option was added for countries using vital registration system data to derive incidence from reported numbers of deaths among people with HIV (as opposed to only AIDS-related deaths).
- Statistical methods for fitting HIV incidence curves to case surveillance and vital registration data were expanded to estimate incidence more accurately in countries where HIV incidence has not yet peaked.

More detailed information on these revisions to the 2016 model can be found at [www.epidem.org](http://www.epidem.org) and in a collection of topical articles published in AIDS.<sup>3</sup>

## MEASURING ANTIRETROVIRAL THERAPY COVERAGE

Since 2013, UNAIDS has provided the number and estimates of the proportion of all adults and children living with HIV who are on antiretroviral therapy (as opposed to estimates of those on treatment that are based on the proportion of adults and children eligible for therapy according to national or international guidelines). This coverage reflects the WHO recommendations of starting antiretroviral therapy among everyone diagnosed as HIV-positive.

Countries report the number of people on treatment through the Global AIDS Monitoring (GAM) tool and through Spectrum. Although those values come through routine data, they are likely to have some level of uncertainty if the country cannot deduplicate individuals who might receive medication from two different clinics or if there are delays in reporting data. Using results from recent data quality reviews, an estimated uncertainty—0.88 and 1.04 for the lower and upper bounds, respectively—was added to the number of people on treatment at the regional and global levels.

## PUBLICATION OF COUNTRY-SPECIFIC ESTIMATES

UNAIDS aims to publish estimates for all countries with populations of 250 000 or more. For the countries with populations of 250 000 or more that did not submit estimates, UNAIDS developed estimates using the Spectrum software that were based on published or otherwise available information. These estimates contributed to regional and global totals but were not published as country-specific estimates.

In countries with low-level epidemics, the number of pregnant women living with HIV is difficult to estimate. Many women living with HIV in these countries are sex workers or people who inject drugs—or they are the sexual partners of gay men and other men who have sex with men or people who inject drugs—making them likely to have different fertility levels than the general population. UNAIDS does not present estimates of mother-to-child HIV transmission, including estimates related to children, in some countries that have concentrated epidemics unless adequate data are available to validate these estimates. UNAIDS also does not publish these estimates for countries where the estimated number of pregnant women living with HIV is less than 50.

With regard to reporting incidence trends, if there are not enough historical data to state with confidence whether a decline in incidence has occurred, UNAIDS does not publish earlier data in order to prevent users from making inaccurate inferences about trends. Specifically, incidence trends are not published if there are fewer than four data points for the key population or if there have been no data for the past four years for countries using repeated survey or routine testing data. Trends prior to 2000 are not published for countries if there is no early case surveillance or mortality data available.

Finally, UNAIDS does not publish country estimates when further data or analyses are needed to produce valid estimates. More information on the UNAIDS estimates and the individual Spectrum files for most countries can be found in the [aidsinfo](http://aidsinfo.unaids.org) section of the UNAIDS website (<http://aidsinfo.unaids.org>)

More information on UNAIDS estimates—along with the individual Spectrum files for most countries—can be found on the UNAIDS website ([www.unaids.org](http://www.unaids.org)).

<sup>3</sup> AIDS. April 2017 – Volume 31- Supplement 1 journal

# PART 2. METHODS FOR DERIVING THE 90-90-90 TARGETS

## INTRODUCTION

Starting in 2016, UNAIDS has provided estimates of global, regional and country-specific progress against the 90-90-90 targets. Progress towards these targets is directly monitored using three basic indicators:

- Indicator 1: The percentage of all people living with HIV who know their HIV status.
- Indicator 2: The percentage of people who know their HIV-positive status and are accessing treatment.
- Indicator 3: The percentage of people on treatment who have suppressed viral loads.

Indicators 2 and 3 can also be expressed as a percentage of all people living with HIV. When numbers or coverage of the treatment target are expressed relative to the total number of people living with HIV, this is typically called “the HIV testing and treatment cascade”. Using this approach, the second and third targets within the 90-90-90 targets translate into 81% coverage of antiretroviral treatment and 73% of people achieving viral suppression by 2020. UNAIDS published its first complete testing and treatment cascade in 2015. Estimates of antiretroviral therapy coverage among people living with HIV are available going back to when treatment was first introduced. Results presented in this report supersede the previously published 2015 values.

UNAIDS also tracks progress towards the 90-90-90 treatment targets by monitoring viral load testing access among people on treatment. If most people in the country are receiving a viral load test annually, as recommended by WHO, we can have confidence in the accuracy of the estimate of viral suppression among all people living with HIV.

## METHODS FOR MEASURING THE 90-90-90 TREATMENT TARGET

To describe country-level progress against the 90-90-90 targets, UNAIDS analysed data on the number of people who knew their HIV status, the number of people on treatment and the number of people virally suppressed among those tested, as reported through the GAM system. In 2015, 147 countries reported at least one measure; in 2016, that number increased to 163 countries.

A description of the GAM system and the treatment target-related indicators that countries report against are provided in the UNAIDS GAM 2017 guidelines (1). All programme data submitted to UNAIDS—including the number of people reported to know their status, the number of people accessing treatment and the number of people on treatment who are virally suppressed—were validated by UNAIDS and its partners prior to publication.

Country-submitted data that did not meet the required validation checks for quality either at the indicator level or across the treatment cascade were not published. The final set of country measures of progress against the 90-90-90 targets for 2015 and 2016 are available at <http://aidsinfo.unaids.org>. Not all countries were able to report against all three prongs of the 90-90-90 targets. Complete treatment cascades are available in 2016 for 60 countries; another 17 countries, primarily in western and central Europe and North America, have complete cascades for at least one year between 2012 and 2015. Upper and lower ranges of uncertainty for country-level estimates were calculated from the range of estimated numbers of people living with HIV. This range may not fully capture uncertainty in the reported programme data.

To estimate regional and global progress against the 90-90-90 targets, UNAIDS supplemented the country-supplied data submitted through GAM with data obtained from a review of other published and unpublished data sources, including grey literature and Demographic and Health Survey results. There were insufficient reported data (reported, published or unpublished) from countries in western Europe and North America in 2016 to present results for the region, although the country values that were available in the region were used to construct the global totals. Upper and lower ranges of uncertainty for global and regional estimates were calculated from the range of numbers of people living with HIV and the lower and upper ranges of the numbers of people on treatment in the region. This range may not fully capture uncertainty in the reported or missing programme data for the first and third indicators.

## DATA SOURCES AND INDICATOR-SPECIFIC METHODS FOR DERIVING GLOBAL AND REGIONAL MEASURES

### Estimates of people living with HIV

Unless otherwise stated, all progress measures in this report are based on UNAIDS global, regional and country-specific modelled estimates for 168 countries of the numbers of people living with HIV in 2015 and 2016. More details about how UNAIDS derives estimates and uncertainty bounds around the number of people living with HIV and those accessing antiretroviral therapy can be found earlier in the section “Measuring antiretroviral therapy coverage”.

### Knowledge of HIV status among people living with HIV

Global and regional measures of the number of people living with HIV who know their status were derived using the most recent HIV surveillance and nationally representative population-based survey data available for 109 countries in 2016. Where data were available separately for children (aged 0-14 years) and adults (aged 15 years and older), age-specific measures were first calculated and then aggregated to produce a national measure.

For 57 countries in 2016, the number of people living with HIV who knew their HIV status was taken as the cumulative number of people notified to the HIV surveillance system, minus deaths among people known to have been HIV-positive. If the measure from the HIV surveillance system was lower than the number of people accessing antiretroviral therapy, the reported value from the surveillance system was excluded from the analysis. In addition, a country’s measure was included only if the HIV surveillance system had been functioning since before 2005. Countries with more recent systems may not have captured all people living with HIV who were diagnosed prior to 2005.

Although HIV surveillance systems can be a reasonably robust source of data to estimate the number of people living with HIV who know their status, biases in the reported numbers may still exist. For example, a country's measure of the knowledge of status may be underestimated if not all people diagnosed are reported to the surveillance system in a timely manner; the measure also may be overestimated if people are reported to the system more than once and these duplicates are not detected. Similarly, if people die or emigrate but are not removed from the system, the number of people living with HIV who are reported to know their HIV status also will be overstated.

The estimated numbers of people living with HIV who knew their status for 25 countries in sub-Saharan Africa in 2016 were derived from nationally representative population-based surveys conducted since 2010 and from treatment data reported through GAM. Three countries with surveys in 2016 directly asked respondents who tested HIV-positive whether they knew their HIV status as part of the survey, and, this proportion was applied to the total number of people estimated to be living with HIV in the country.

In the remaining 22 countries with a survey that did not directly ask participants about knowledge of their HIV status, a stepwise approach was used to estimate knowledge of status.

In the first step, the total percentage of people who could know their status in the year of the most recent survey is estimated. For adults, this percentage was estimated by calculating the percentage of adults who had reported ever having been tested for HIV and had received the last test result among those who tested HIV-positive in the survey. For children, who are not included in the survey, a proxy measure of treatment coverage among children in the survey year is used to estimate knowledge of status among children. This is a conservative measure as some children may not have initiated treatment. To estimate knowledge of status for all people in the year of the survey, the child and adult estimates were combined, weighted by the numbers of children and adults living with HIV.

In the second step, the percentage of people who could know their status in the current or previous reporting year was derived by projecting the results from the first step forward. To do this, an assumption was made that the rate of testing scale-up was similar to the rate of scale-up of people starting treatment, calculated by the percentage point difference in total treatment coverage (for both adults and children) between the survey year and either the current or previous year's treatment coverage value. For countries in eastern and southern Africa, half of the percentage increase in treatment coverage was applied, informed by comparisons done to surveys in the region in 2016 where knowledge of HIV status was explicitly asked; in countries in western and central Africa, where stigma and discrimination may have limited disclosure of a previous HIV testing event in the survey, the full percentage increase was taken.

For surveys conducted in 2016, the 2015 value was projected backwards from the 2016 survey estimate using a similar process as the one described above.

In the third step, the estimate of people living with HIV who know their status for the year 2015 or 2016 was derived by using the mid-point between the percentage of people living with HIV who could know their status in 2016 (i.e., step 2) and the percentage of people living with HIV on treatment for 2015 or 2016.

Knowledge of HIV status based on survey data has a number of limitations, especially when participants are not directly asked if they know their HIV status. Typically, estimates derived from these surveys will underestimate knowledge of status for three reasons. As previously noted, in settings where stigma and discrimination is or has been high, people may be reluctant to disclose that they have ever tested for HIV and received their results. Second, many people who report ever testing may have seroconverted after their last test result and are therefore incorrectly counted as aware of their HIV status. Finally, most surveys that do not directly ask respondents about their HIV status occurred prior to 2016. Although surveys conducted prior to 2010 were excluded, it is possible that the adjustment method applied to account for the historical nature of the survey does not accurately capture increases in the knowledge of status among people living with HIV that occur over time.

Underestimation of the reported number of people living with HIV who know their status can also occur in countries where survey respondents are directly asked about their HIV status. In these instances, the risk is that survey participants do not disclose their HIV status to interviewers and are incorrectly classified as unaware of their status. While it is impossible to measure the exact magnitude of this bias, in previous surveys in Kenya, Malawi and Uganda, anywhere from one tenth to one third of HIV-positive participants misreported their HIV status as negative (2). Underestimation of knowledge of status also can occur at the national level if people living with HIV learn their status either as a result of—or subsequent to—the survey.

For 27 countries without case surveillance data submitted through GAM or survey measures, UNAIDS used published and unpublished grey literature or modelled estimates to inform the 2015 and 2016 regional and global values. A similar method used to adjust knowledge of status for indirect surveys was applied to estimates from such countries before 2016 (most of them in western and central Europe).

For 59 countries without any estimate of the number of people living with HIV who know their status, which are home to just 4% of the total estimated number of people living with HIV worldwide, the regional average of the ratio of the number of people who know their status and the number on treatment was calculated from available data submitted by countries in the region and weighted according to the number of people living with HIV by country. This regional value was then applied to the estimated number of people on treatment for each country with a missing estimate to derive a complete regional snapshot for the reporting year. The total number of people estimated to know their HIV status was added across the region and globally to construct the first and the second 90.

### **People accessing antiretroviral therapy**

Global and regional measures of antiretroviral therapy numbers are calculated from country-reported programme data through GAM and the UNAIDS-supported Spectrum software. For a small number of countries where reported numbers of people on treatment are not available—primarily in western and central Europe and North America—estimates of the number of people on treatment are developed either in consultation with the public health agency responsible for monitoring the national treatment programme or based on published sources.



In partnership with UNICEF, WHO and other partners that support treatment service delivery in countries, UNAIDS reviews and validates treatment numbers reported through GAM and Spectrum on an annual basis. UNAIDS staff also provide technical assistance and training to country public health and clinical officers to ensure the quality of the treatment data that are reported. Nevertheless, this measure may overestimate the number of people on treatment if people who transfer from one facility to another are reported by both facilities. Similarly, coverage may be overestimated if people who have died, have disengaged from care or have emigrated are not identified and removed from treatment registries. Treatment numbers also may be underestimated if not all clinics report the numbers on treatment completely or in a timely manner.

UNAIDS recently completed a triangulation of data to verify the UNAIDS global estimate of people accessing antiretroviral therapy at the end of 2015. For more details about how confident UNAIDS is in reported treatment numbers, please see *How many people living with HIV access treatment?*<sup>4</sup>

### **People who have achieved viral suppression**

Progress towards the viral suppression target among people on treatment and as a proportion of all people living with HIV was derived from data reported to GAM. For the purposes of reporting, the threshold for suppression is a viral load of less than 1000 copies per ml, although some countries may set lower thresholds or require persons to achieve an undetectable viral load.

UNAIDS GAM 2017 guidelines state that countries should only report viral load test results that were done as part of routine service delivery (i.e. not as a result of suspected treatment failure). This guidance also specifies only a person's last test result from the reporting year be submitted, so the reported number suppressed among those tested should represent people and not tests performed.

Across the regions, 88 countries reported viral load suppression data from case-based surveillance or laboratory-based reporting systems in 2016. Three countries reported survey data for 2016 from nationally representative population-based surveys, where viral load testing was done only among those who self-reported that they were on treatment. Through a review of the published and unpublished literature, UNAIDS identified nationally representative estimates of viral load suppression for an additional five countries. Where more recent data were not available from countries in western and central Europe and North America in 2016, it was assumed to be the same as the viral suppression estimate for 2015.

For the 72 countries in 2016 with no nationally representative estimate of viral suppression among those tested, which represent 58% of the people on treatment worldwide, the regional average number of people on antiretroviral therapy who are virally suppressed was calculated using data submitted by countries in the region, weighted according to the number of people on treatment in a country. This value was then applied to the estimated

number of people on treatment in the country to derive a complete regional snapshot for the reporting year. The total number of people suppressed was added across the region and globally to construct the third 90 and the overall estimate of viral suppression among people living with HIV. The same approach also was used to construct 2015 regional and global estimates.

Although the number of countries with an estimate of viral load suppression data increased from 74 in 2015 to 96 in 2016, a number of challenges in using country reported data to monitor the 90–90–90 targets remain. First, routine viral load testing may not be offered at all treatment facilities, and those facilities where it is offered may not be representative of the care available at facilities without viral load testing. By assuming that the percentage of people suppressed among those accessing viral load testing is representative of all people on treatment in the country, the measure may be either over- or underestimated depending on the characteristics of the reporting clinics.

Second, reported access to viral load testing varies considerably across each region, and it is difficult to know whether the experience in countries that reported data to UNAIDS is similar to that of countries without data in the region. In western and central Africa, viral load testing data submitted to UNAIDS in 2015 accounted for just 2% of all people on treatment in the region. As a result, viral suppression levels for the region were not published for 2015.

UNAIDS assumes that all people on treatment in western and central Europe and North America received an annual viral load test in both 2015 and 2016.

Another challenge in measuring the accuracy of viral load suppression estimates is that UNAIDS guidance requests routine (annual) viral load testing results only for those people who are on treatment. If people newly initiated on treatment achieve viral suppression but have not yet been offered viral load testing, they will be incorrectly classified as not suppressed and the resulting viral suppression estimate will be understated.

UNAIDS also requests countries to only report results from routine viral load testing. If countries report test results primarily performed because of suspected treatment failure, the number of people virally suppressed in these countries will be underestimated. UNAIDS validates country submissions for quality, but it is not always possible to identify cases where both routine and other types of testing are occurring.

Finally, UNAIDS guidance recommends reporting viral load test results only for people on antiretroviral treatment; persons who are on treatment but naturally suppress the virus will not be included in this measure.

As access to viral load testing coverage expands and routine monitoring systems are strengthened to compile and report these data, the ability to quantify and eventually reduce bias in the 90–90–90 targets will improve.

<sup>4</sup> The document is available at <http://www.unaids.org/en/resources/documents/2016/how-many-people-living-with-HIV-access-treatment>.

DATA AVAILABILITY FOR CONSTRUCTING UNAIDS MEASURES OF PROGRESS AGAINST 90-90-90 TREATMENT TARGETS

	KNOWLEDGE OF STATUS-RELATED TARGETS				ANTIRE-TROVIRAL THERAPY TARGETS-RELATED		VIRAL SUPPRESSION-RELATED TARGETS					
	Countries with a measure for the first and second 90 (#)		Availability of a knowledge of status measure among people living with HIV (%)		Countries with a measure of the number of people on treatment and included in the UNAIDS special analysis of progress toward the 90-90-90 treatment targets (#)		Countries with a measure for the third 90 (#)		Availability of viral suppression status among all people on treatment (%)		Countries with measures against all three targets	
	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016	2015	2016
Asia and the Pacific	19	20	94%	99%	28	28	14	14	29%	18%	12	11
Caribbean	4	7	79%	93%	10	10	6	10	14%	52%	3	7
Eastern and southern Africa	16	17	99%	99%	19	19	7	11	14%	37%	7	11
Eastern Europe and central Asia	13	12	98%	99%	18	18	11	13	59%	93%	11	12
Latin America	9	14	79%	82%	17	17	9	14	75%	87%	4	12
Middle East and North Africa	8	6	89%	80%	18	18	6	6	33%	32%	4	2
Western and central Africa	14	13	89%	88%	24	24	6	14	2%	13%	1	9
Western and central Europe and North America*	25	20	99%	98%	34	34	15	14	100%	100%	13	12
<b>Global</b>	<b>108</b>	<b>109</b>	<b>95%</b>	<b>96%</b>	<b>168</b>	<b>168</b>	<b>74</b>	<b>96</b>	<b>26%</b>	<b>42%</b>	<b>55</b>	<b>76</b>

Source: UNAIDS special analysis, 2017.

\* Percentage of people receiving a viral load test on treatment assumed to be 100%

## PART 3. DISTRIBUTION OF NEW HIV INFECTIONS BY SUBPOPULATION

The distribution of new HIV infections by region was estimated based on data for 163 countries using five data sources.

For countries that model their HIV epidemic based on data from subpopulations, including key populations, the numbers of new infections were extracted from Spectrum 2016 files. This source provided data from 63 countries for sex workers, 37 countries for people who inject drugs, 57 countries for men who have sex with men and 13 countries—only in Latin America and Asia—for transgender people.

The second source was mode of transmission studies conducted in countries between 2006 and 2012. The proportions of new infections estimated for each subpopulation, calculated by modes of transmission analyses, were multiplied by the number of total new adult (15–49) infections, by relevant gender, to derive an estimated number of new infections by subpopulation. This source provided data from 18 countries for sex workers, 25 countries for people who inject drugs and 22 countries for men who have sex with men.

New HIV infections for European countries with neither of the aforementioned data were derived from the European Centre for Disease Prevention and Control (ECDC) HIV Surveillance Report 2014. The proportions of new diagnoses for each region in Europe (West, central and East) were applied to UNAIDS estimates of new infections in each country for people who inject drugs and men who have sex with men. Data for sex workers were not available from the ECDC report. New HIV infections in China, Russia and the United States of America were taken from available national reports of new diagnoses.

New HIV infections among countries without a direct data source were calculated from regional benchmarks. The benchmarks were set by the median proportion of new infections in the specific subpopulation in all available countries in the same region. The majority of these countries were located in sub-Saharan Africa. There were 91 countries which used benchmark values for the sex work estimate, 62 countries for the people who inject drugs estimate, 66 countries for the men who have sex with men estimate and 44 countries for the transgender people estimate.

The calculated proportions of infections for each key population include the sex partners of members of key populations. New infections among sex partners of key populations were estimated using transmission probabilities from the literature.

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